Northwest **Power** and **Conservation** Council

October 7, 2025

MEMORANDUM

TO: **Council Members**

FROM: **Windy Schoby**

SUBJECT: **White sturgeon status report for the Snake River between Hells Canyon Dam and the Lower Granite pool**

BACKGROUND:

Presenter: Joe DuPont, Clearwater Regional Fisheries Manager (Idaho Department of Fish and Game)

Summary:

The Idaho Department of Fish and Game, in collaboration with Idaho Power, is studying White Sturgeon populations in the Snake River between Hells Canyon Dam and Lower Granite Dam. The presentation will review population status, factors influencing abundance, ongoing efforts, and potential future actions to support long-term persistence.

Research indicates that juvenile sturgeon abundance in Hells Canyon has declined since the early 1970s. Juvenile growth rates are among the slowest in the Columbia Basin, reducing the number reaching adulthood. Over the past decade, meaningful recruitment has occurred only once, and the total population has declined by approximately 33%. It is estimated that more than 50% of each year-class is lost downstream of Lower Granite Dam, likely contributing to the long-term decline in juvenile abundance.

Recent changes in the biological community within the Lower Granite Reservoir appear to be affecting recruitment and survival. Trap-and-haul pilot studies, both

upstream and downstream, are underway to evaluate whether this approach can improve growth and increase spawning abundance. Additionally, the University of Idaho is developing a population model to assess long-term trends and evaluate the potential benefits of different management actions.

Relevance: White Sturgeon are listed as an emerging priority in the Council's 2014 Fish and Wildlife Program and 2020 addendum. This report provides information to the region on the status and management of a portion of the Snake River.

Background: Snake River White Sturgeon Management- (IDFG 2024)

White Sturgeon have declined from historical abundances across their range, including Idaho. Historical declines are a combination of factors including overfishing, habitat manipulation, poor water quality, bioaccumulation of contaminants, and altered fish assemblages in larger river systems. However, habitat alteration and fragmentation from dam construction during 1900 – 1980 are considered the primary factors in declines in wild populations within Idaho. Dam construction and operations blocked migrations and altered flows, water temperatures, and nutrient regimes.

Two genetically distinct White Sturgeon populations exist in the Snake River:

- **Lower Snake River Population** (below Hells Canyon Dam) — genetically similar to lower Columbia River sturgeon.
- **Middle Snake River Population** (upstream of Brownlee Dam) — genetically distinct and fragmented by six dams.

Below Hells Canyon Dam, there is one continuous free-flowing reach along the Idaho border, but outside of Idaho, the lower Snake River genetic population is fragmented by the four lower Snake River dams in the state of Washington. Above Brownlee Dam there are six management reaches within the Middle Snake River genetic population. Because of very low abundance and limited genetic information available for Oxbow or Hells Canyon reservoirs, it is unknown at this time whether these reaches are included in the Lower Snake or Middle Snake genetic populations.

Reaches from Lower Granite Dam to Hells Canyon Dam and C.J. Strike Dam to Bliss Dam support natural spawning and recruitment of White Sturgeon previously resulting in stable or increasing abundance. Remaining reaches in the middle Snake River require hatchery stocking or downstream movement of sturgeon to support reach abundance as limited or no natural recruitment occurs in these reaches.

Some reaches, such as from Lower Granite Dam to Hells Canyon Dam and C.J. Strike to Bliss Dam, still support natural spawning and recruitment. Other reaches rely on hatchery stocking or downstream movement of fish to maintain abundance.

The White Sturgeon hatchery program, jointly operated by IDFG and Idaho Power, collects fertilized eggs from the wild (C.J. Strike–Bliss reach), hatches and rears them in a hatchery, and releases juveniles into reaches with limited recruitment—a process known as **repatriation**. The program also supports recreational angling opportunities upstream of Shoshone Falls.

Management reaches are categorized as follows:

- **Core Wild:** Self-sustaining populations with adequate natural recruitment. Management focuses on maintaining environmental conditions that support spawning and survival.

- **Stocked:** Populations dependent on hatchery supplementation due to habitat limitations such as flow or fragmentation.

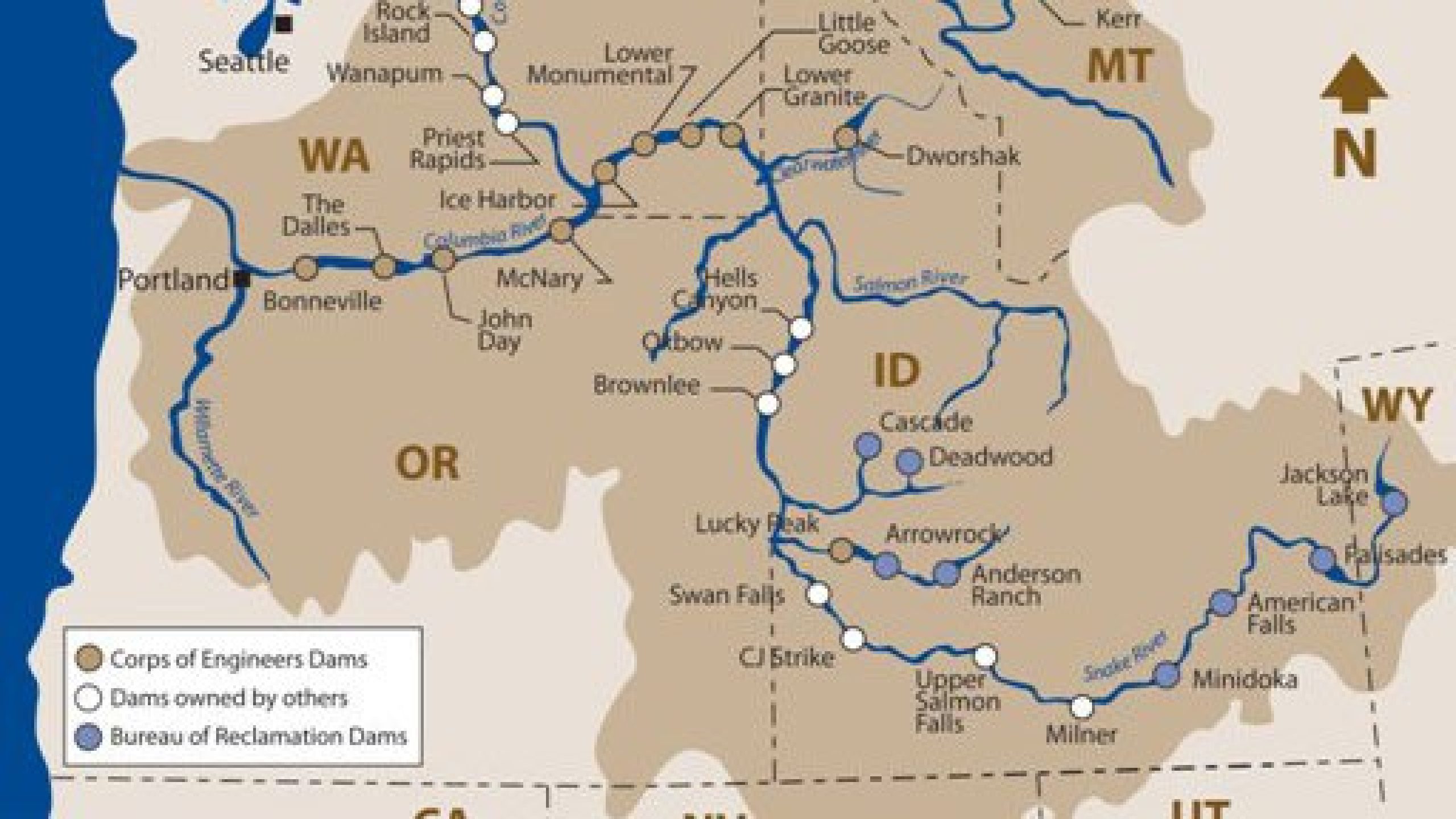
- **Non-native Range:** Reaches upstream of Shoshone Falls, supported solely through hatchery stocking to provide angling opportunities.

More info:

- Idaho Department of Fish and Game Snake River White Sturgeon Management Plan 2024-2033
- 2025 Joint Staff Report – Stock status and fisheries for sturgeon and smelt
- The Council's White Sturgeon web page
- Columbia Basin White Sturgeon Planning Framework
- White Sturgeon Story Map

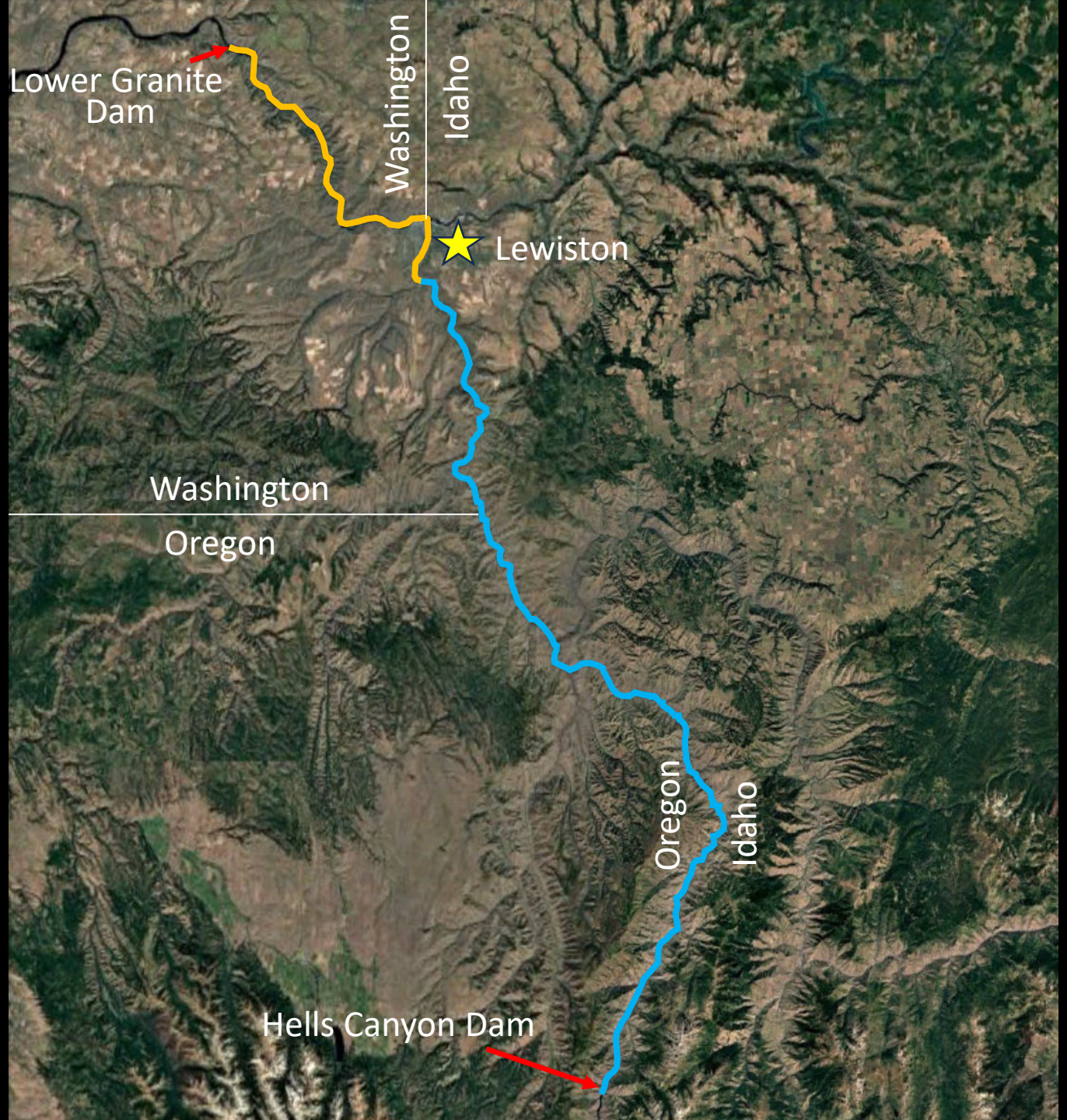
Hells Canyon White Sturgeon Update

Idaho Power Company
USGS
USACE
NPT
IDFG
UI


Seattle
Rock Island
Wanapum
Priest Rapids
Lower Monumental
Little Goose
Lower Granite
Kerr
MT
N
WA
Dworshak
Ice Harbor
The Dalles
Columbia River
Portland
Bonneville
McNary
John Day
Hells Canyon
Snake River
Oxbow
Brownlee
ID
WY
OR
Willamette River
Cascade
Deadwood
Jackson Lake
Lucky Peak
Arrowrock
Palisades
Anderson Ranch
Swan Falls
American Falls
C.J. Strike
Upper Salmon Falls
Snake River
Minidoka
Milner
Corps of Engineers Dams
Dams owned by others
Bureau of Reclamation Dams

Reservoir 36 miles

Free flowing River
101 miles



1972 – 1975 (Coon et al. 1977)

- 876 (204 recaps) WS captures using set lines and rod-and-reel
- Work only occurred in pools in free-flowing river

1982 – 1984 (Lukens 1985)

- 531 (49 recaps) WS captures using set lines and rod-and-reel
- Work occurred in river from Captain John to Johnson Bar

1990 – 1991 (Lepla 1994)

- 946 (147 recaps) WS captures using mostly gill nets
- Work occurred in Lower Granite pool

1997 – 2002 (Lepla et al. 2001; Everett et al. 2002)

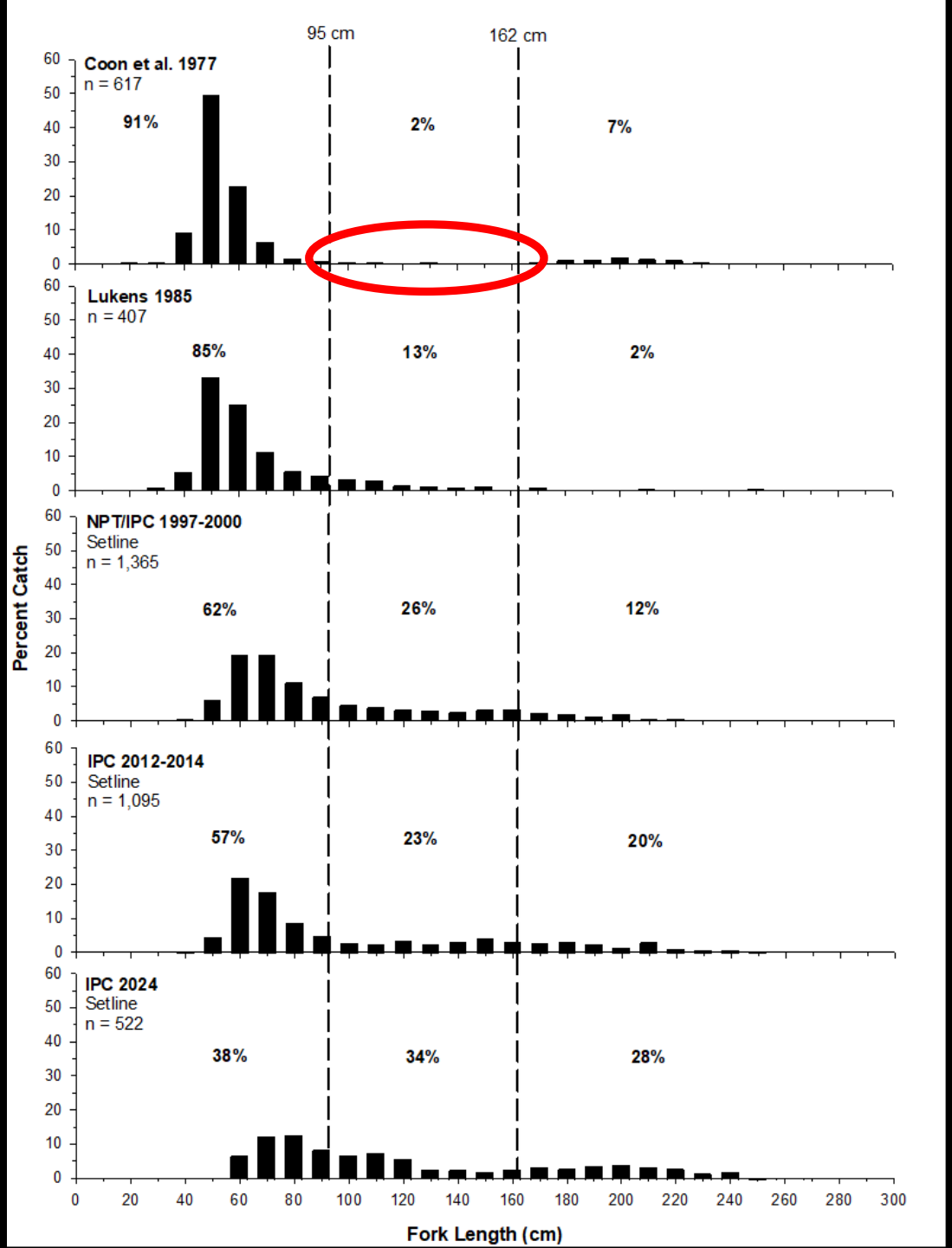
- 1,857 WS captures (521 recaps) using set lines
- Work occurred from Lower Granite Dam to Granite Rapids

2012 – 2014 (Bentz 2015)

- 1,483 (281 recaps) WS captures using set lines
- 37% of catch < 3ft
- Work occurred from Lower Granite Dam to Hells Canyon Dam

2024 - 2025 (Bentz in progress)

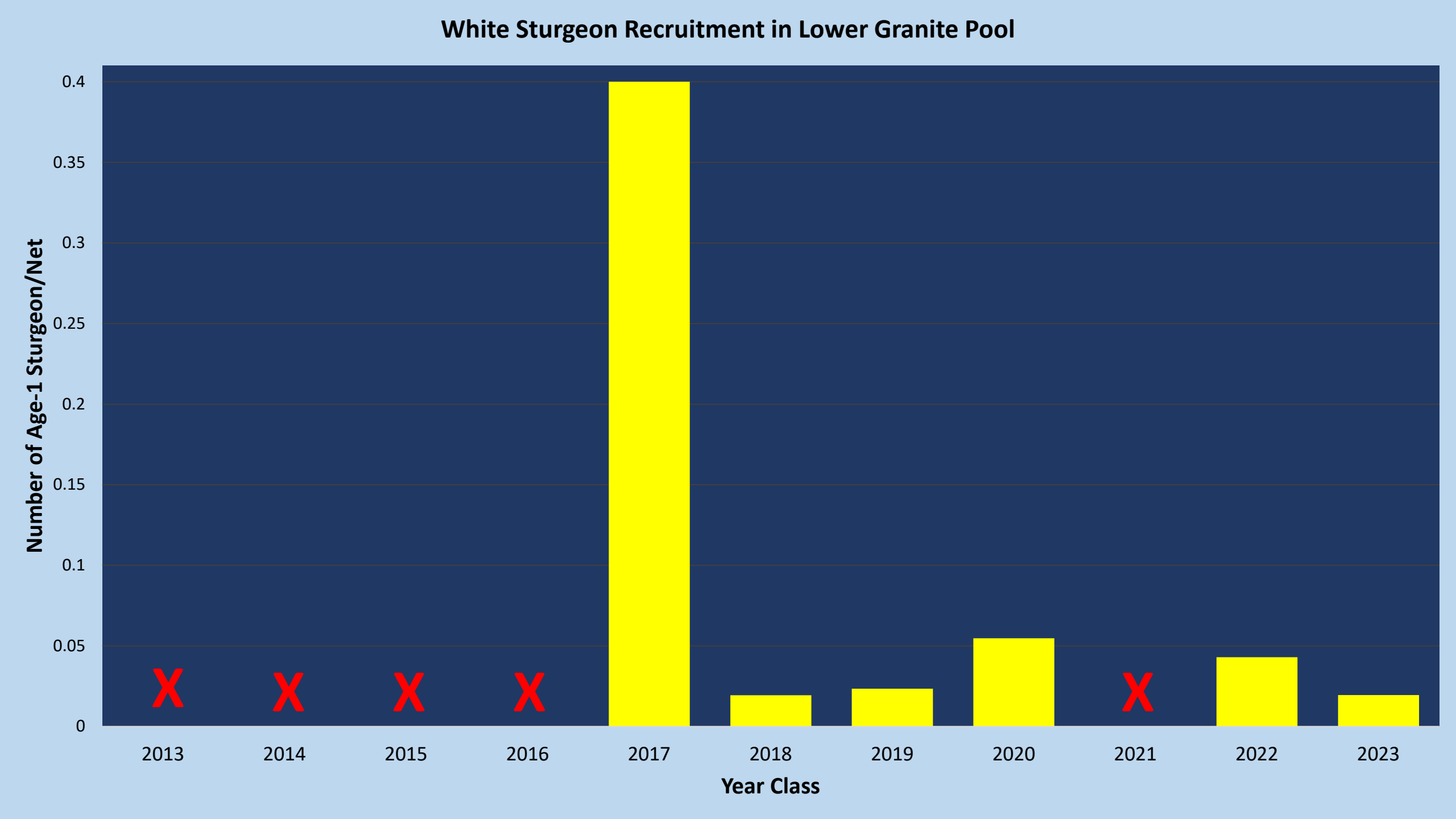
- Work occurred from Lower Granite Dam to Hells Canyon Dam



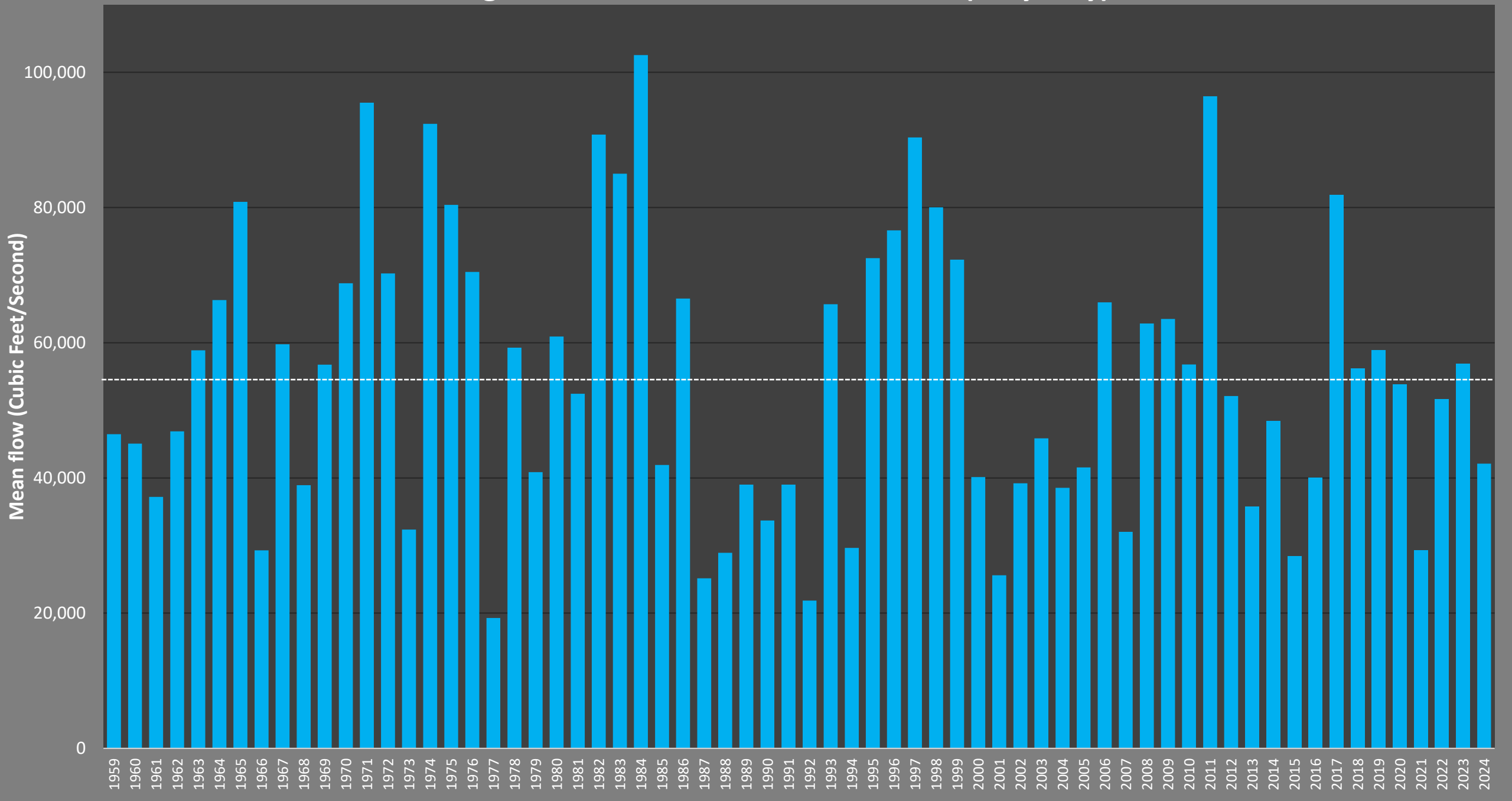
From 1960-1969 3-6 ft fish could be harvested

Starting 1970 no harvest was allowed

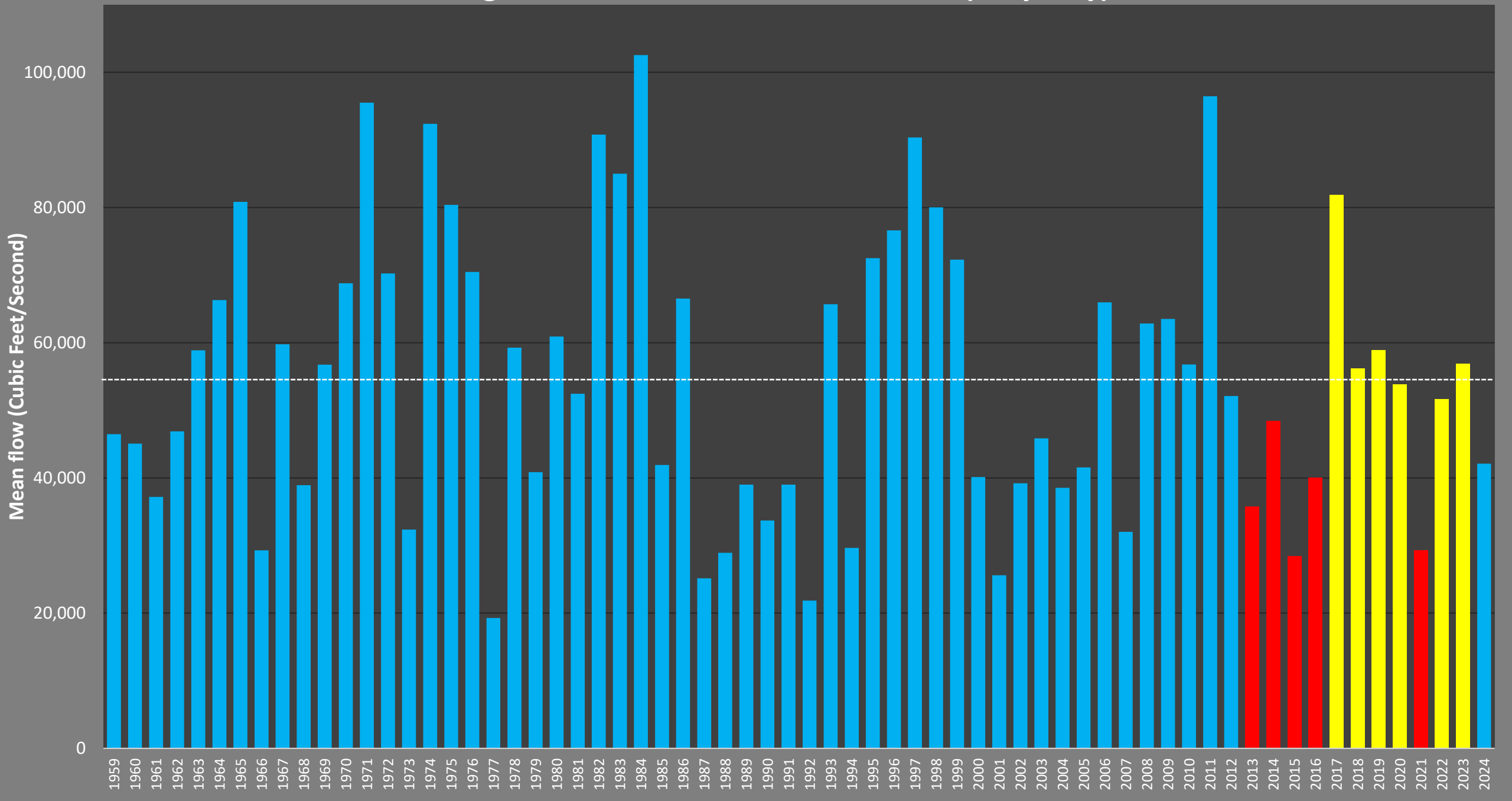

Cabela's
InMotion

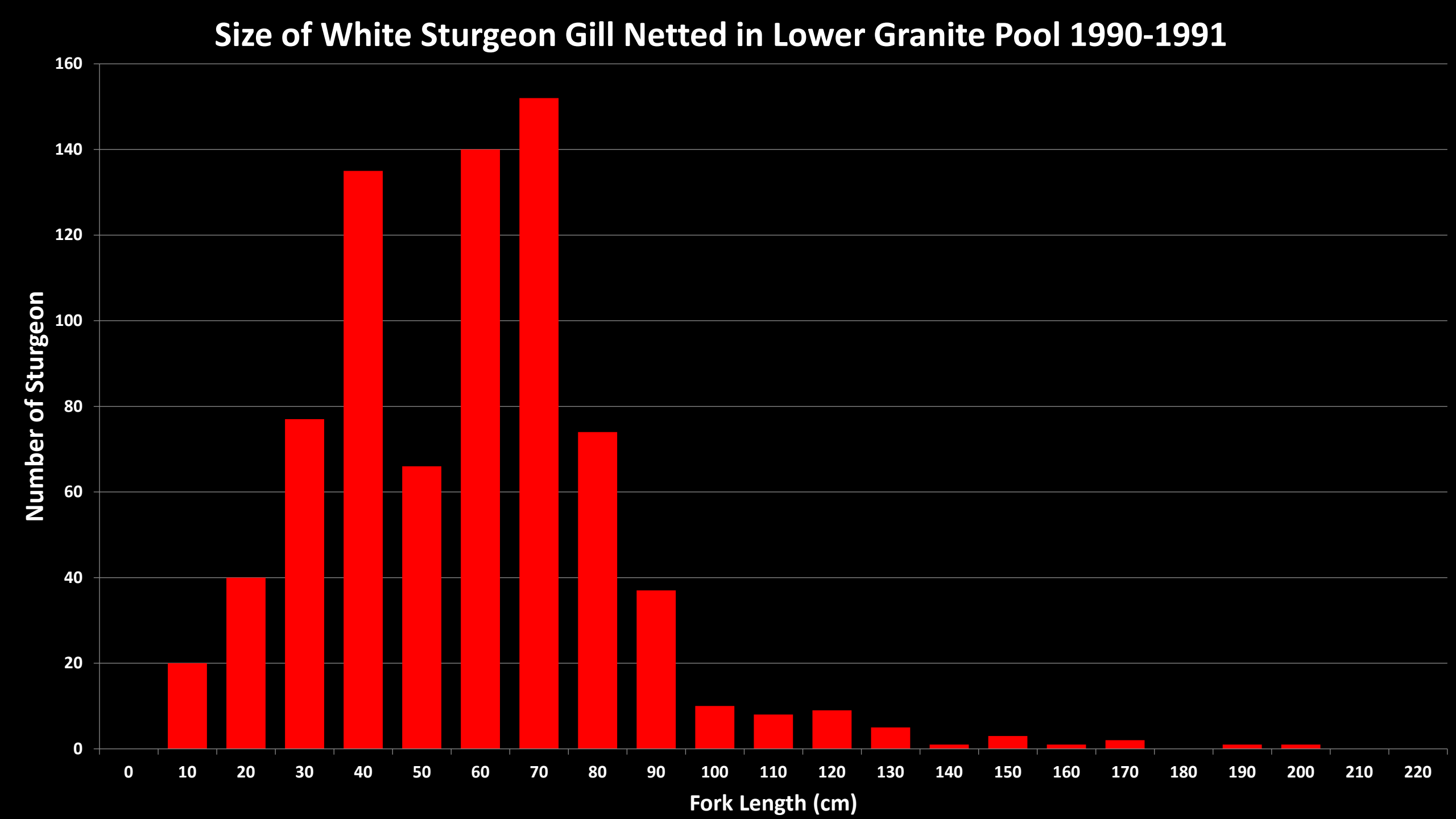

White Sturgeon Recruitment in Lower Granite Pool
Number of Age-1 Sturgeon/Net
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
X
X
X
X
X
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year Class

Average flow in Snake River at Anatone (May-July)

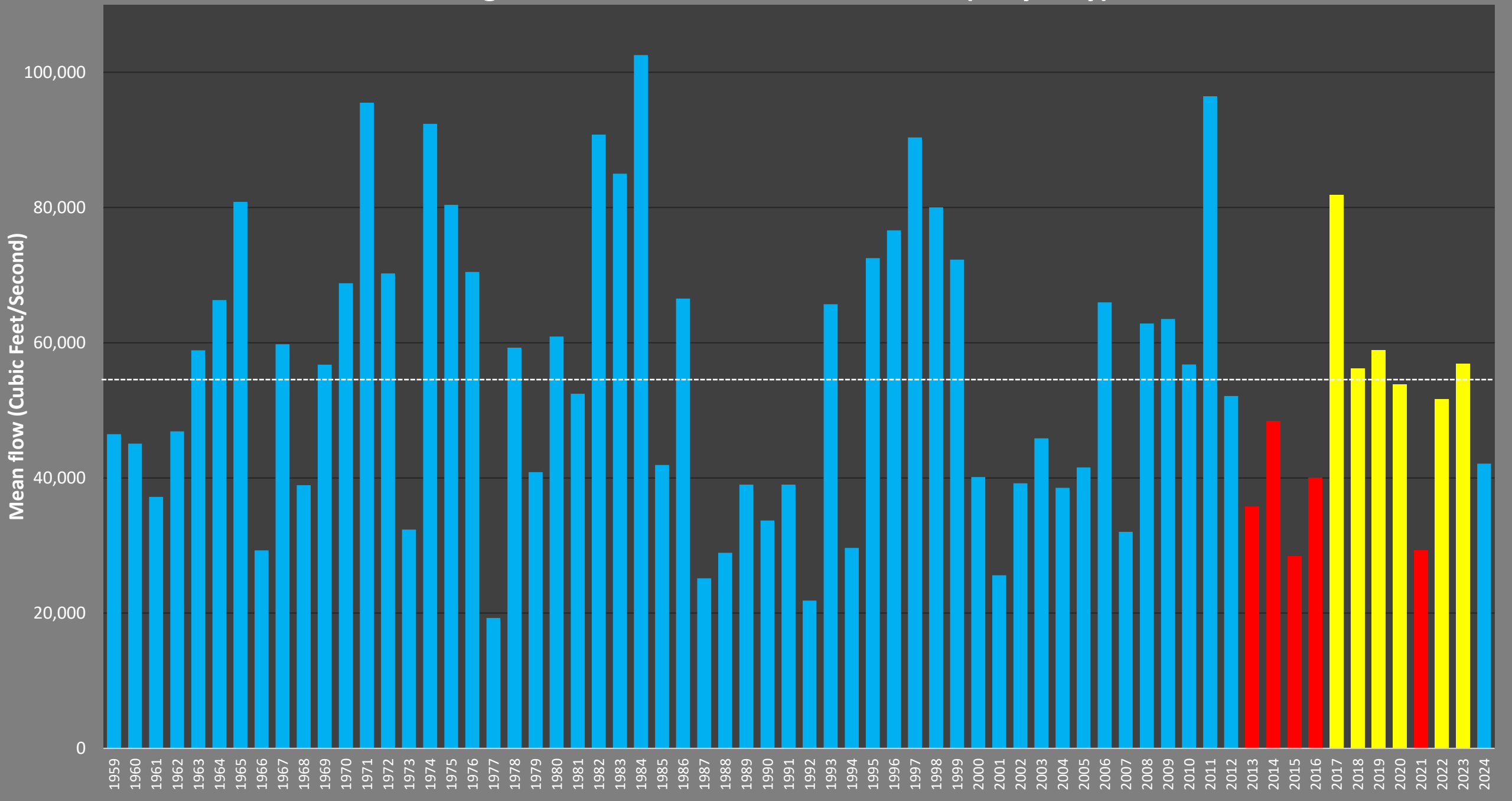


Average flow in Snake River at Anatone (May-July)

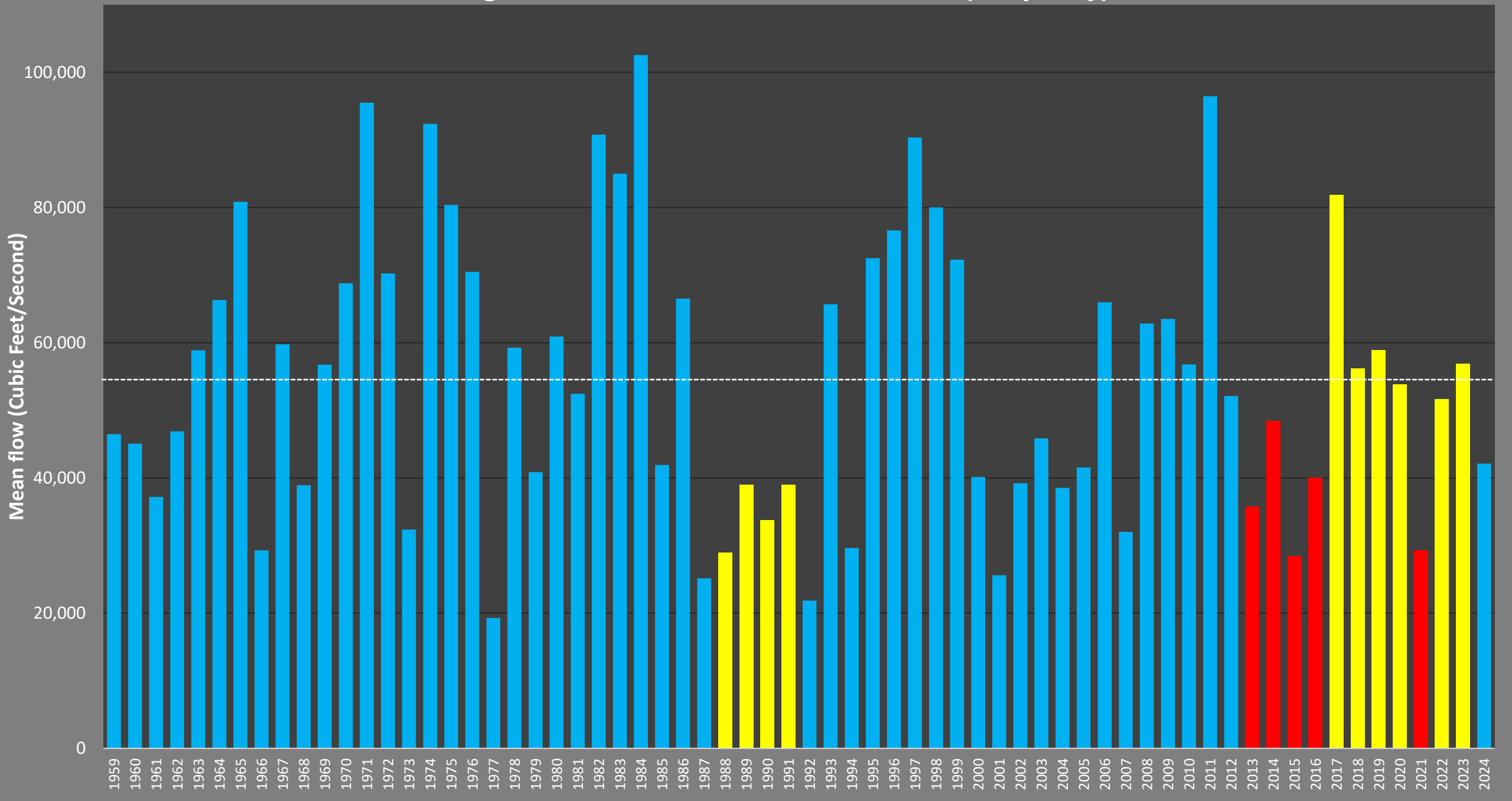



Size of White Sturgeon Gill Netted in Lower Granite Pool 1990-1991
Number of Sturgeon
0
20
40
60
80
100
120
140
160
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
Fork Length (cm)

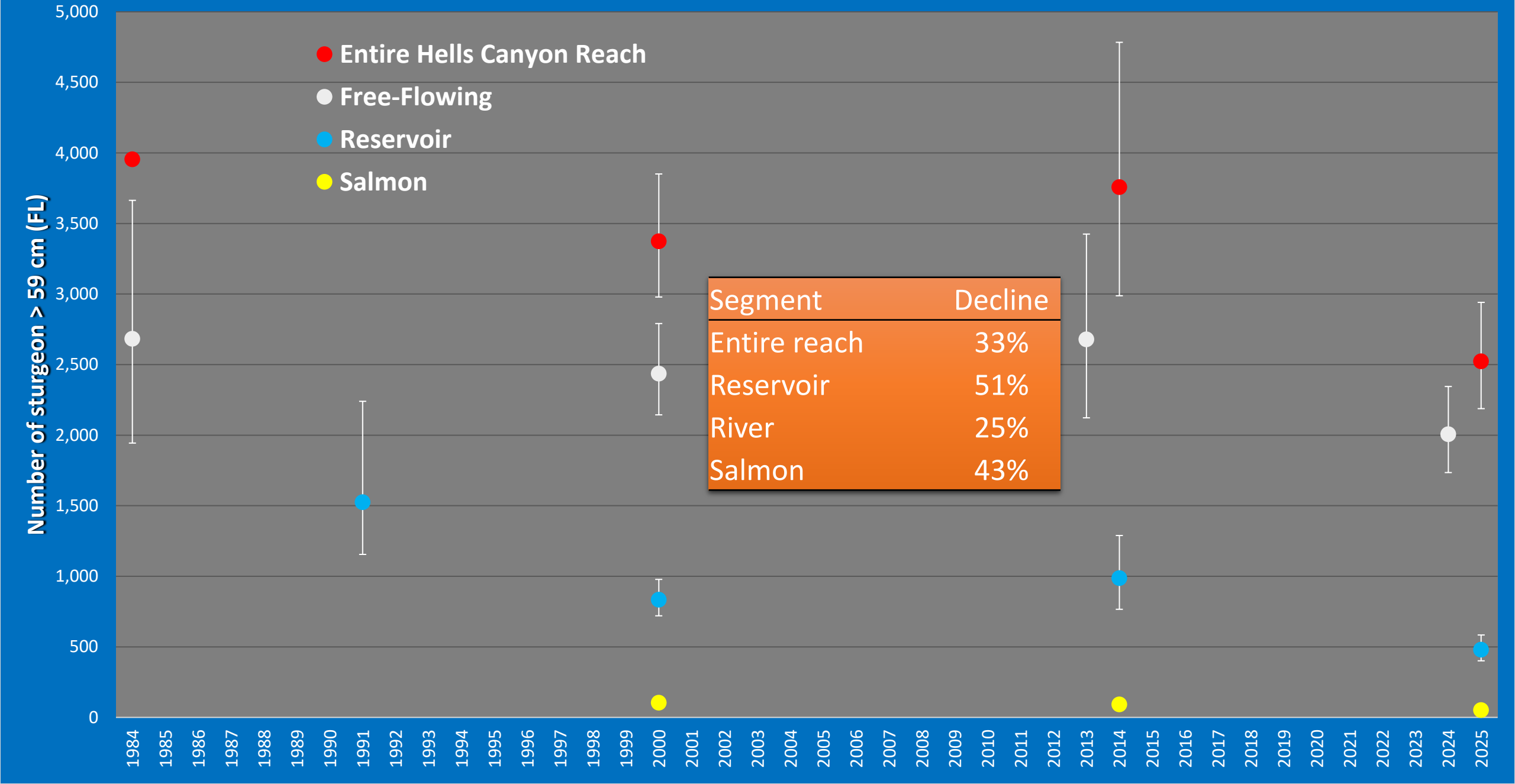
Average flow in Snake River at Anatone (May-July)



Average flow in Snake River at Anatone (May-July)



White Sturgeon Population Estimate in the Hells Canyon Reach



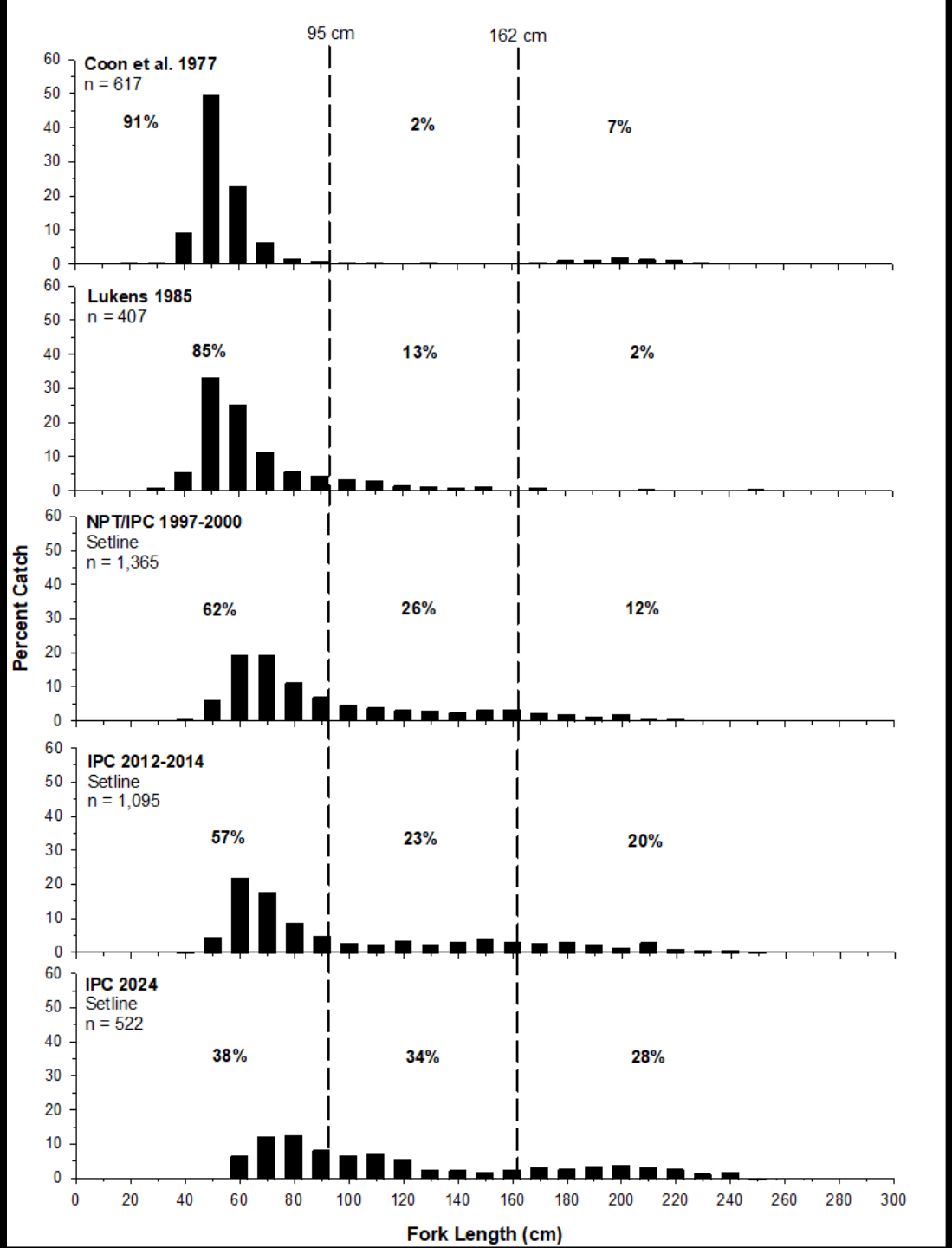
Segment	Decline
Entire reach	33%
Reservoir	51%
River	25%
Salmon	43%

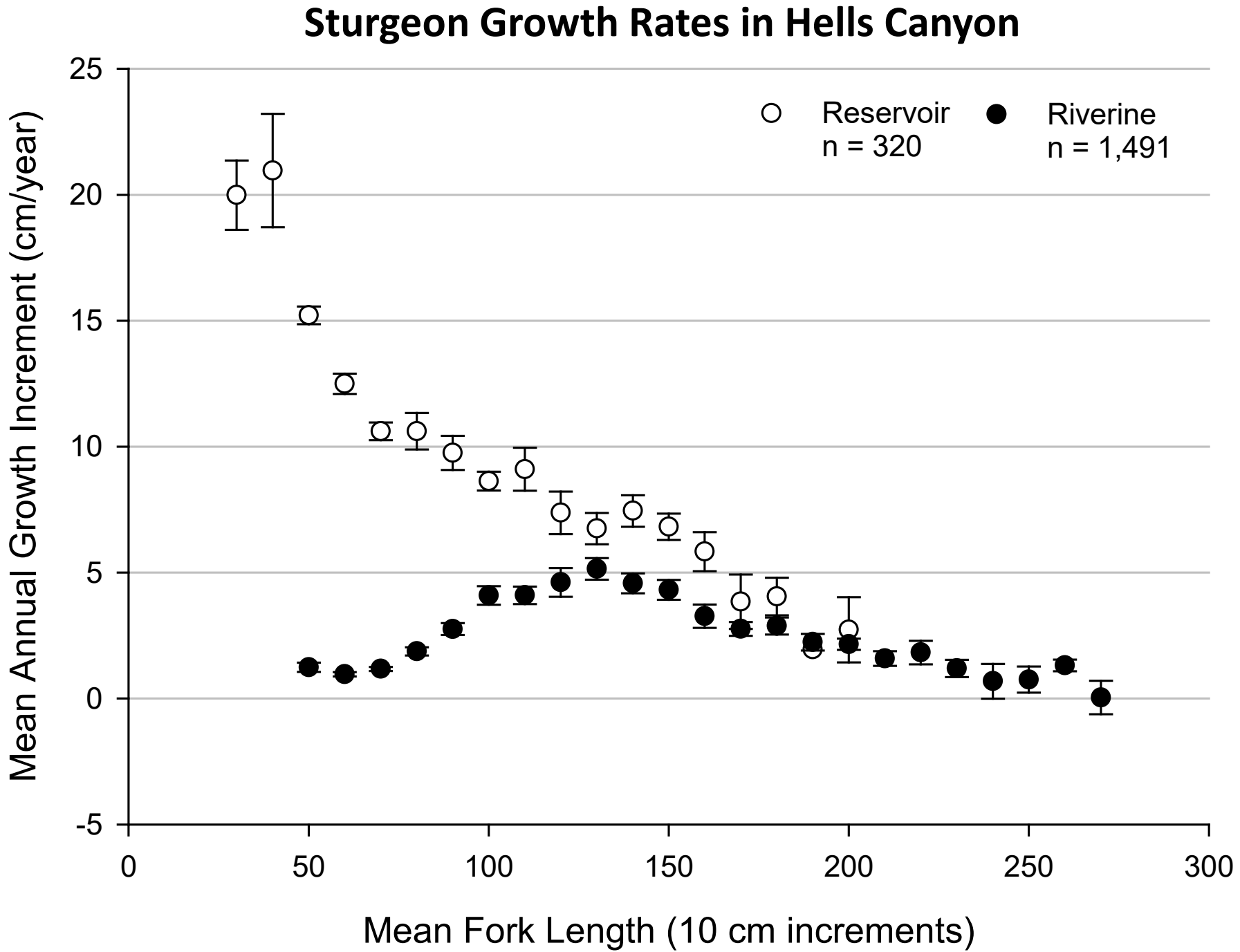
What is going on?

Why has a long-term declining trend in juvenile abundance occurred?

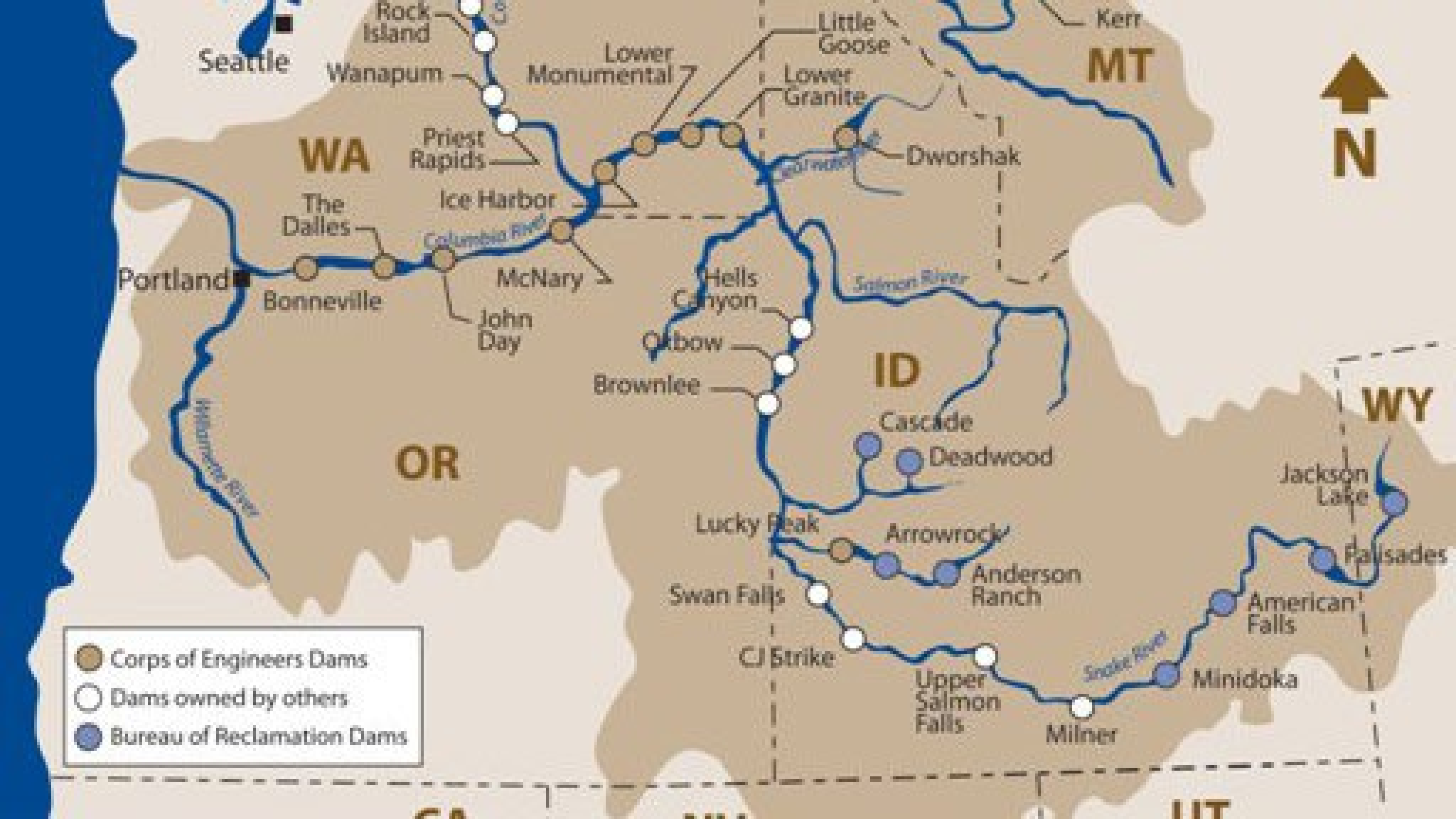
Why has the more recent decline in recruitment occurred?

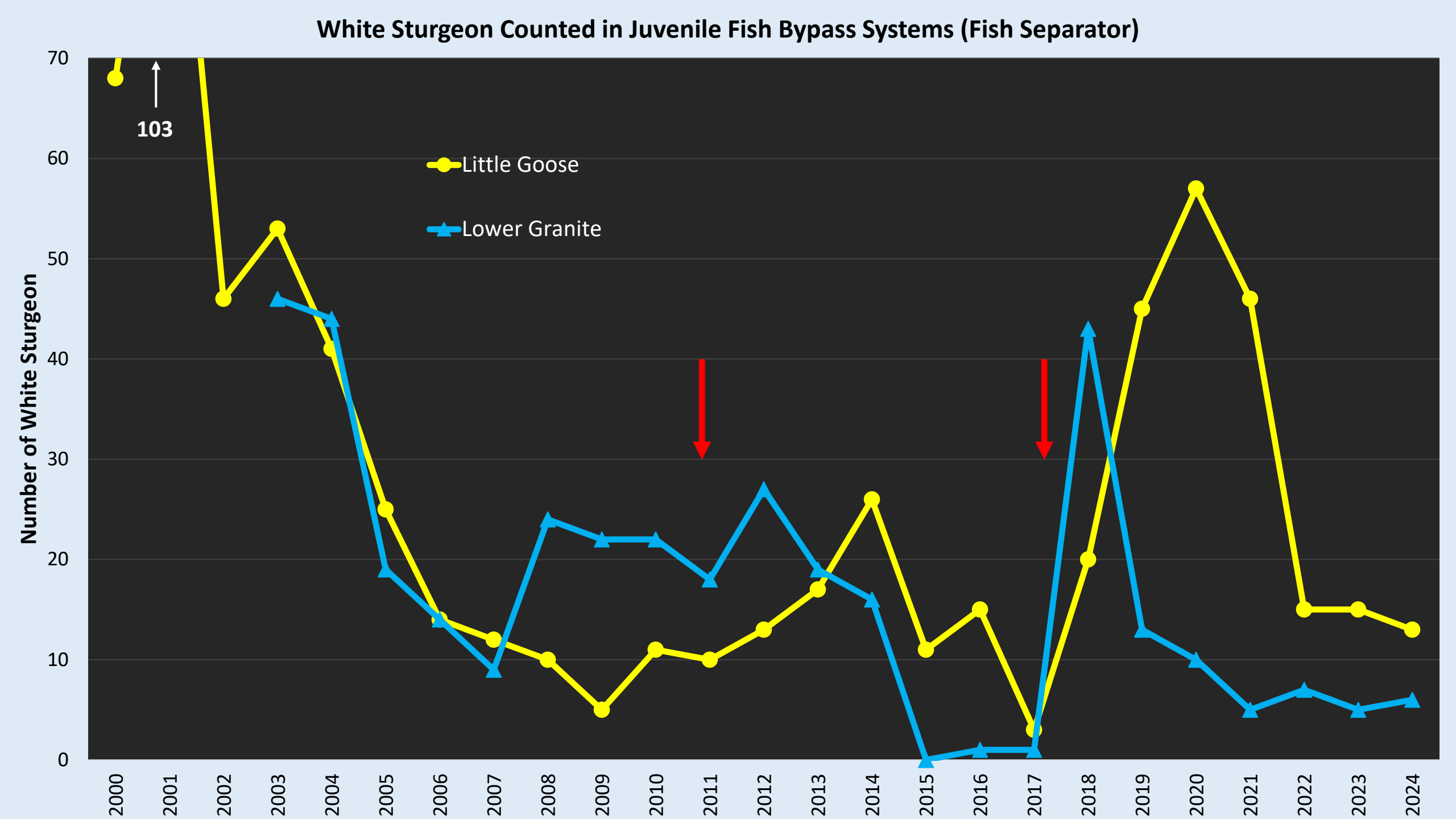
Why has a long-term declining trend in juvenile abundance occurred?

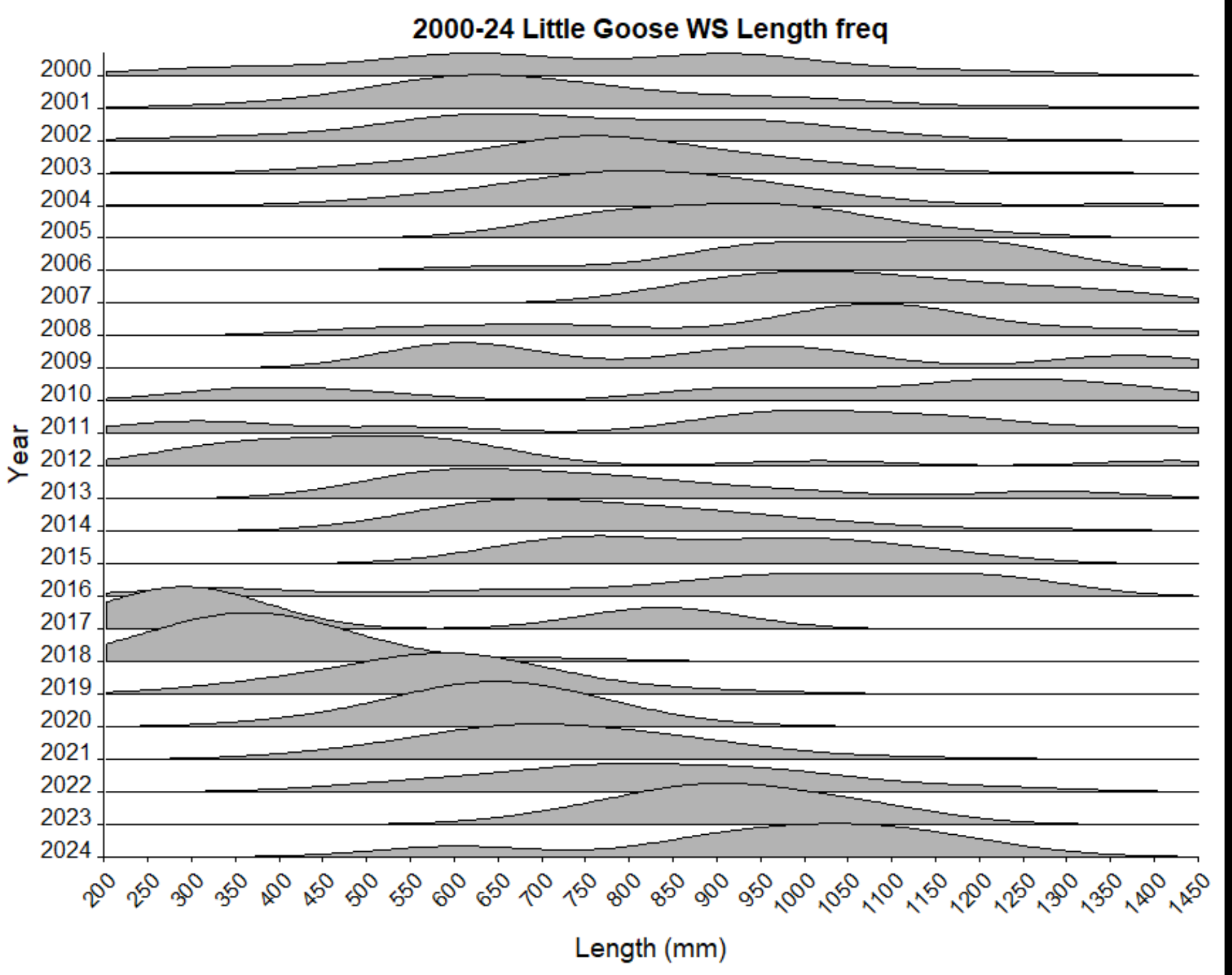



Sturgeon Growth Rates in Hells Canyon
Reservoir
n = 320
Riverine
n = 1,491
Mean Annual Growth Increment (cm/year)
25
20
15
10
5
0
-5
0
50
100
150
200
250
300
Mean Fork Length (10 cm increments)

Entrainment


Seattle
Rock Island
Wanapum
Priest Rapids
Lower Monumental
Little Goose
Lower Granite
Kerr
MT
N
WA
Dworshak
Ice Harbor
The Dalles
Columbia River
Portland
Bonneville
McNary
John Day
Hells Canyon
Snake River
Oxbow
Brownlee
ID
WY
OR
Willamette River
Cascade
Deadwood
Jackson Lake
Lucky Peak
Arrowrock
Palisades
Anderson Ranch
Swan Falls
American Falls
C.J. Strike
Upper Salmon Falls
Snake River
Minidoka
Milner
Corps of Engineers Dams
Dams owned by others
Bureau of Reclamation Dams


White Sturgeon Counted in Juvenile Fish Bypass Systems (Fish Separator)
Number of White Sturgeon
70
60
50
40
30
20
10
0
103
Little Goose
Lower Granite
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


2000-24 Little Goose WS Length freq
Year
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
Length (mm)

Can we estimate how much sturgeon entrainment occurs past Lower Granite Dam?

293 fish PIT tagged from 2017 year class
42 acoustic tagged fish
Fish separator data

50-80% of 2017 year class entrained

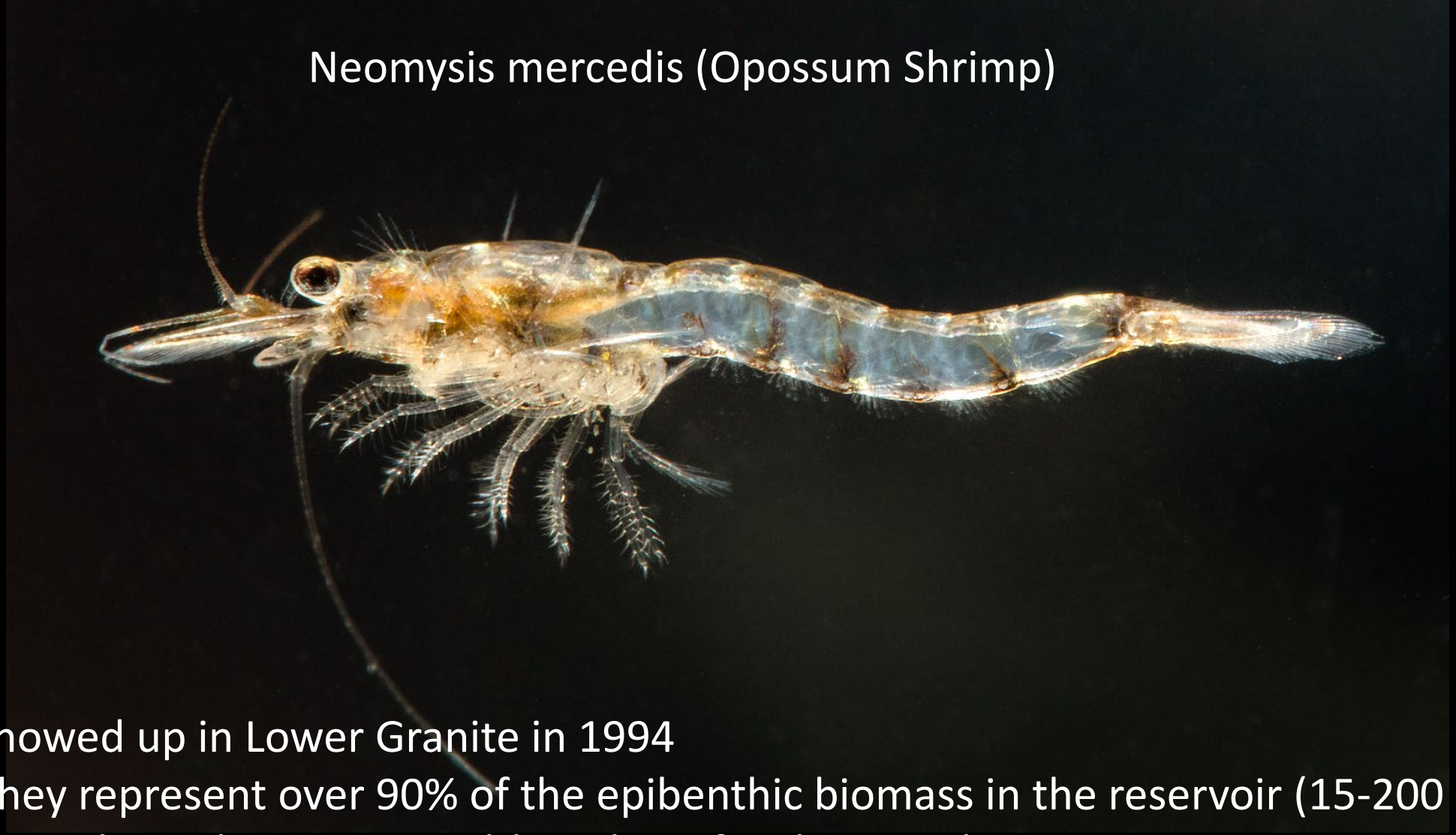
My Thoughts on Entrainment

Why the recent decline in recruitment?

- Decline in recruitment (to age-1)


www.nmt.us
NMT
30
40
50
60
70
80
90
100
110
120
130
140

Neomysis mercedis (Opossum Shrimp)



First showed up in Lower Granite in 1994

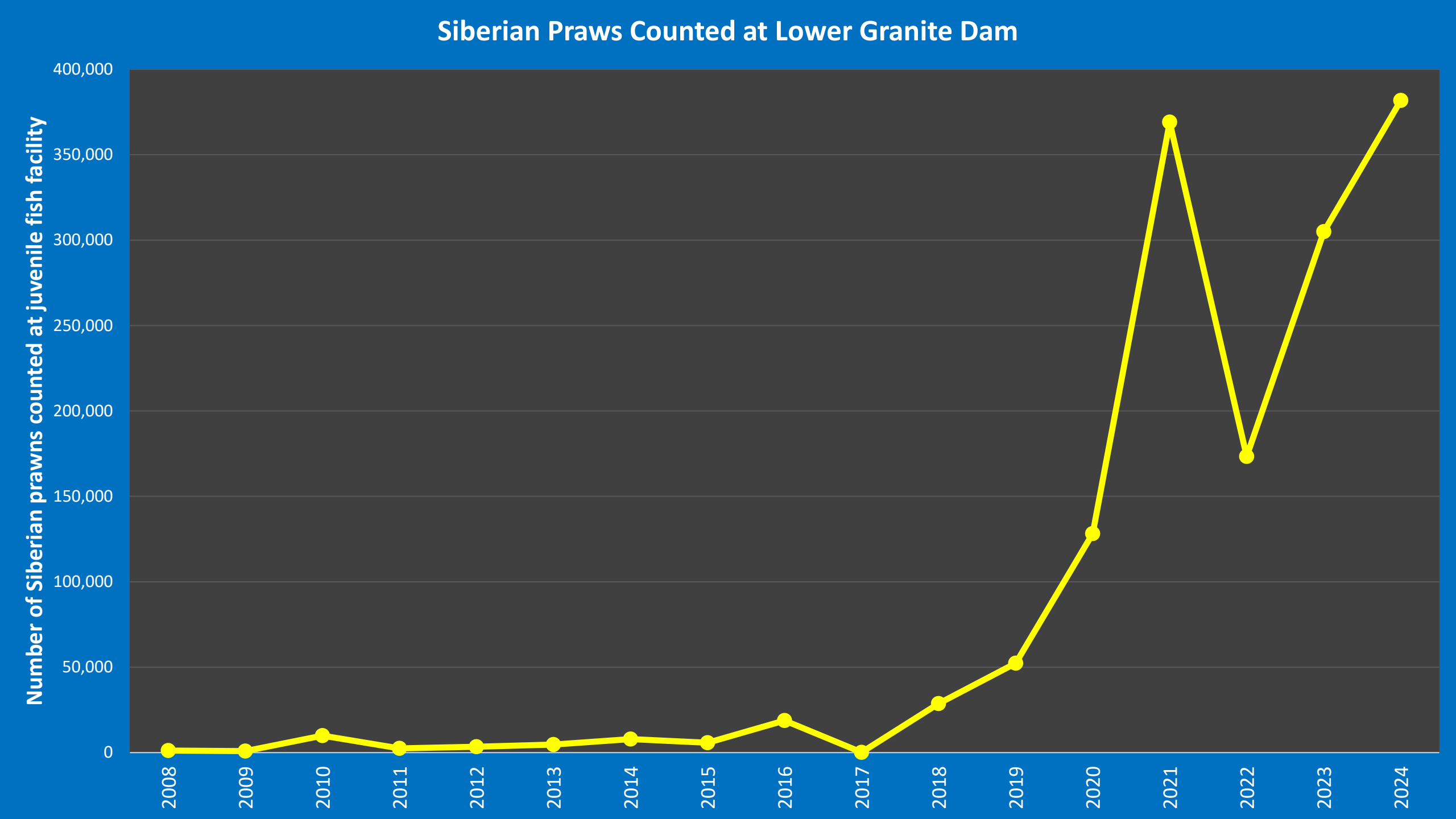
Now they represent over 90% of the epibenthic biomass in the reservoir (15-200 m^2)

Live throughout the reservoir although prefer slower velocities

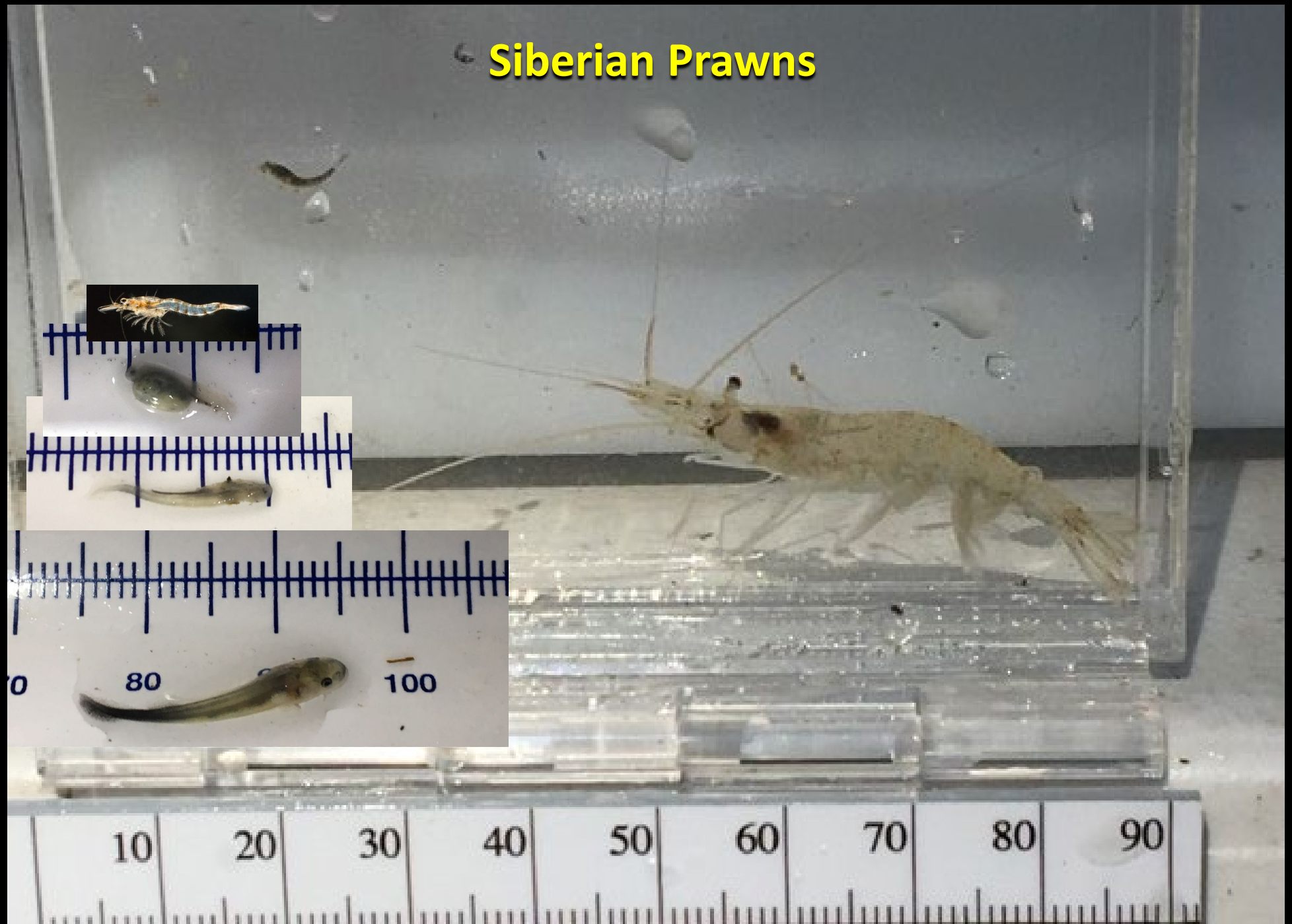
Average length: 12 mm

Siberian Prawns

First detected at Lower Granite Dam in 1998
Size Range: 20-80 mm
Prefer slower deeper water
Primary prey: opossum shrimp

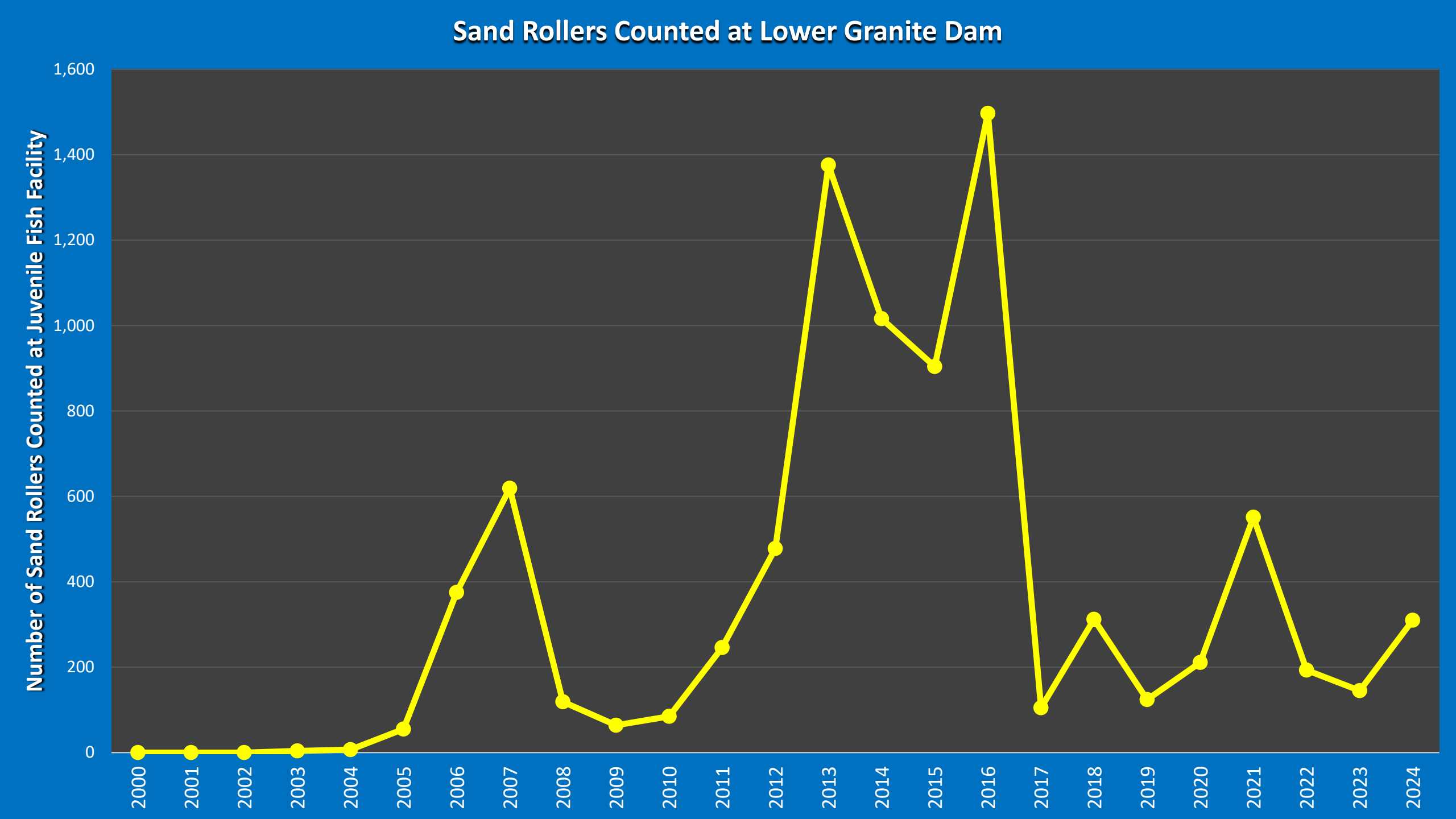

Siberian Praws Counted at Lower Granite Dam
Number of Siberian prawns counted at juvenile fish facility
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

Siberian Prawns

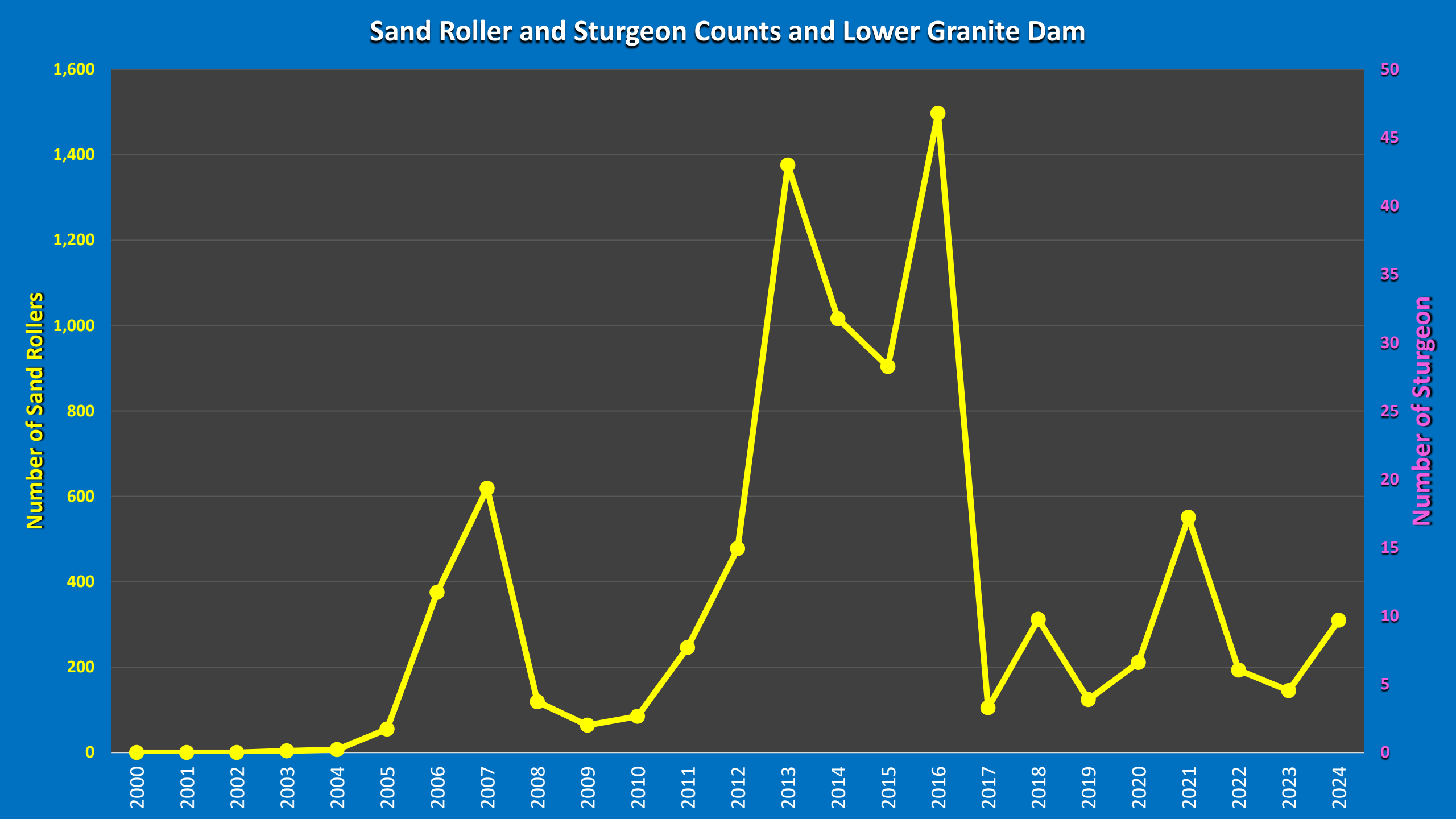


Sand Rollers

Native to Columbia basin
First collected in Snake River at Lower Granite in 2003
Prefer smaller substrates
Occupy shallow and deep habitats
Main food item is opossum shrimp although larval fish were found in their diet


Sand Rollers Counted at Lower Granite Dam
Number of Sand Rollers Counted at Juvenile Fish Facility
1,600
1,400
1,200
1,000
800
600
400
200
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

Sand Rollers


Sand Roller and Sturgeon Counts and Lower Granite Dam
Number of Sand Rollers
Number of Sturgeon
1,600
1,400
1,200
1,000
800
600
400
200
0
50
45
40
35
30
25
20
15
10
5
0
2000
2001
2002
2003
2004
2005
2006
2007
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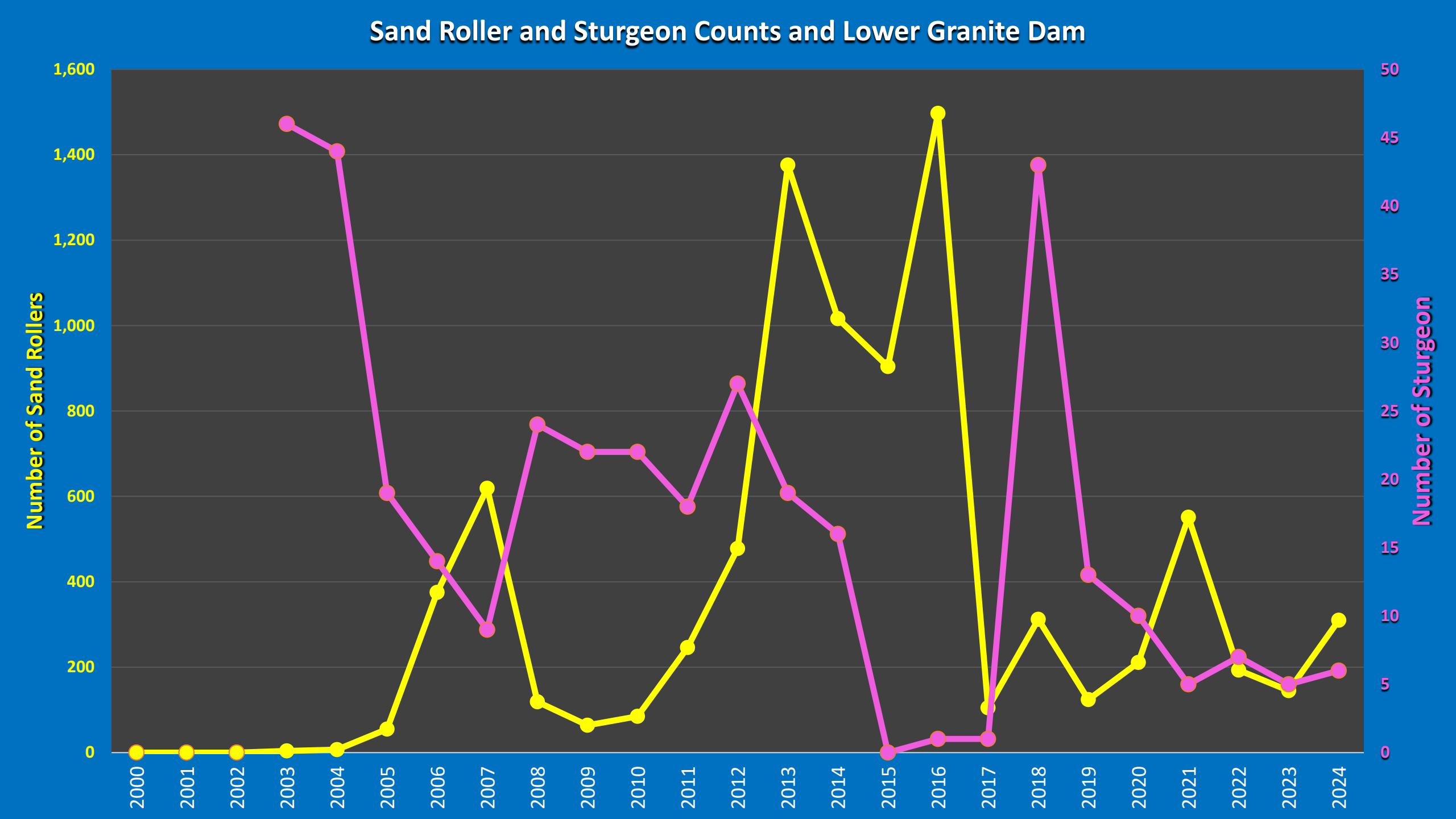

Sand Roller and Sturgeon Counts and Lower Granite Dam
Number of Sand Rollers
Number of Sturgeon
1,600
1,400
1,200
1,000
800
600
400
200
0
50
45
40
35
30
25
20
15
10
5
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

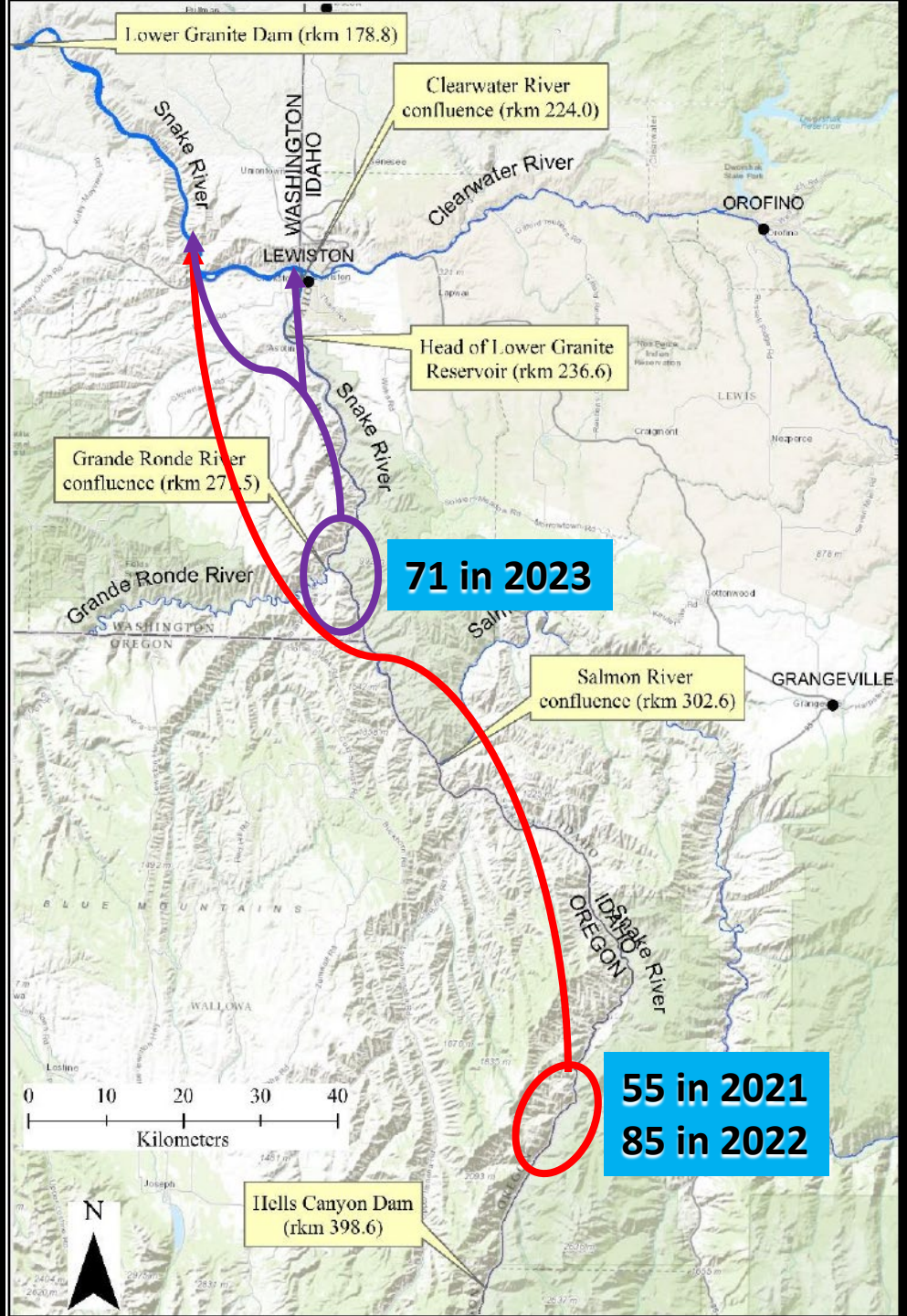
What are we doing about it?

Translocation studies


Downstream Translocation

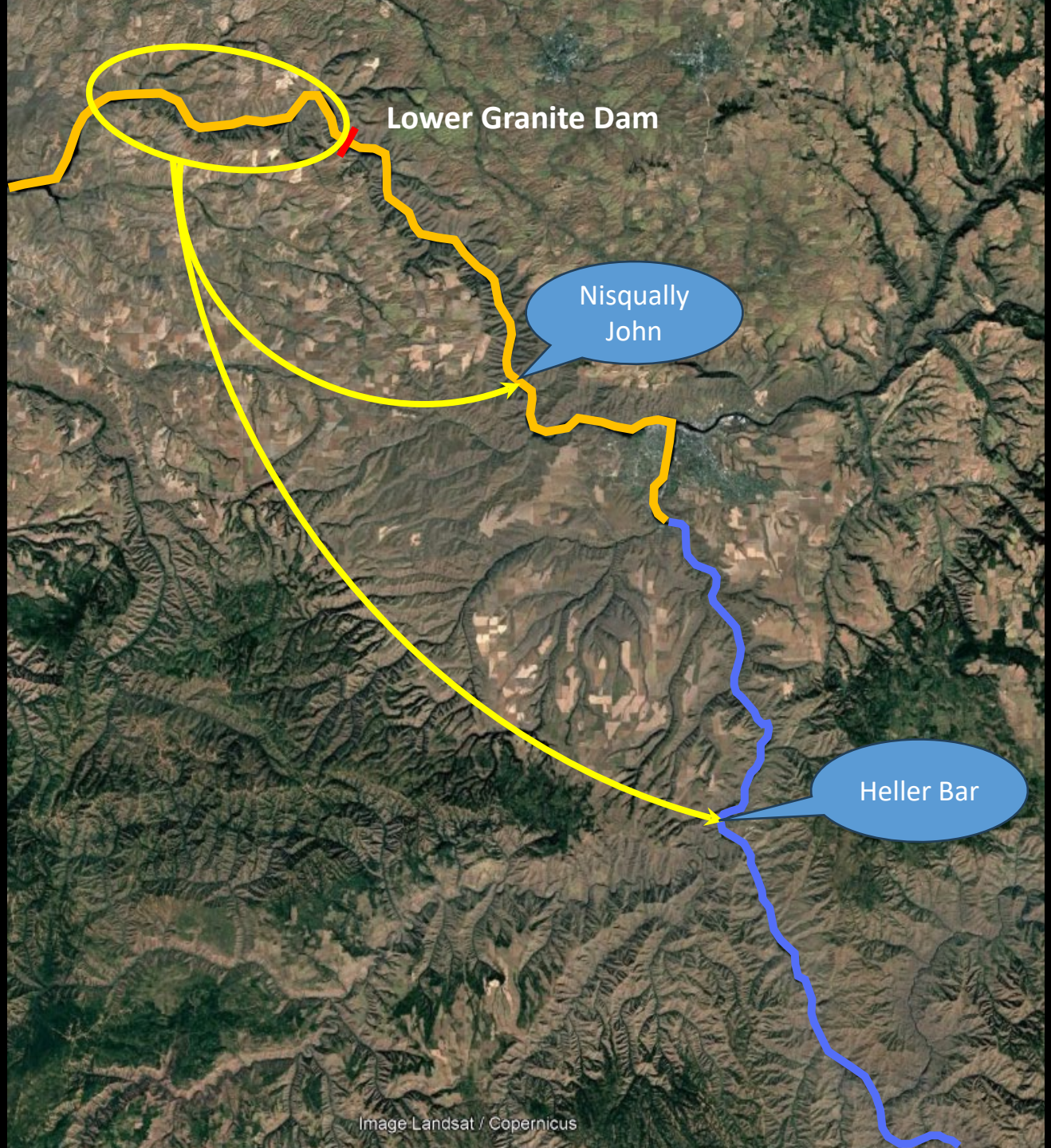

05
POWERSTROKE

211 fish translocated
Between 2021 to 2023
42 were acoustic tagged




Upstream Translocation

Moved 80 sturgeon

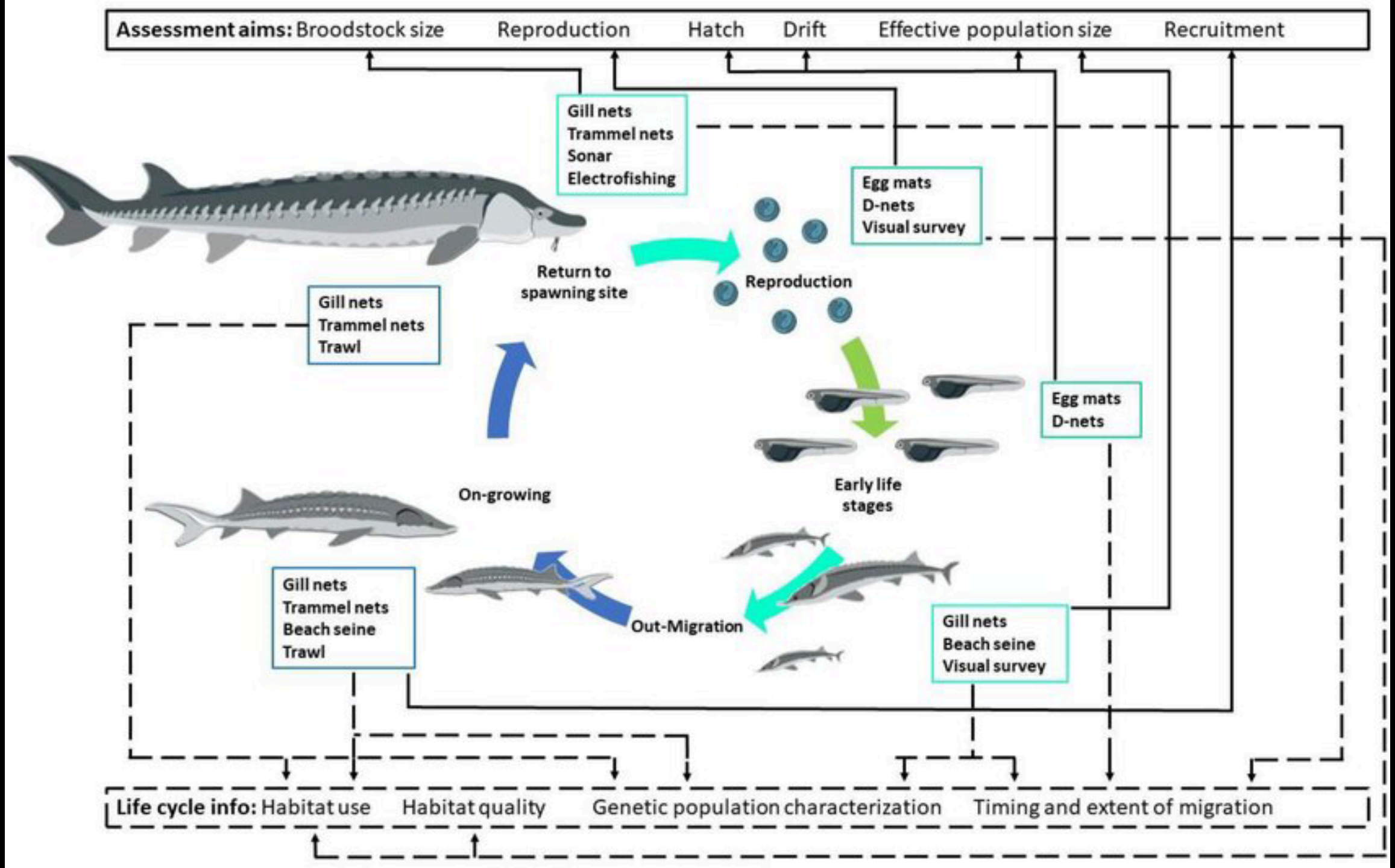


Nisqually John

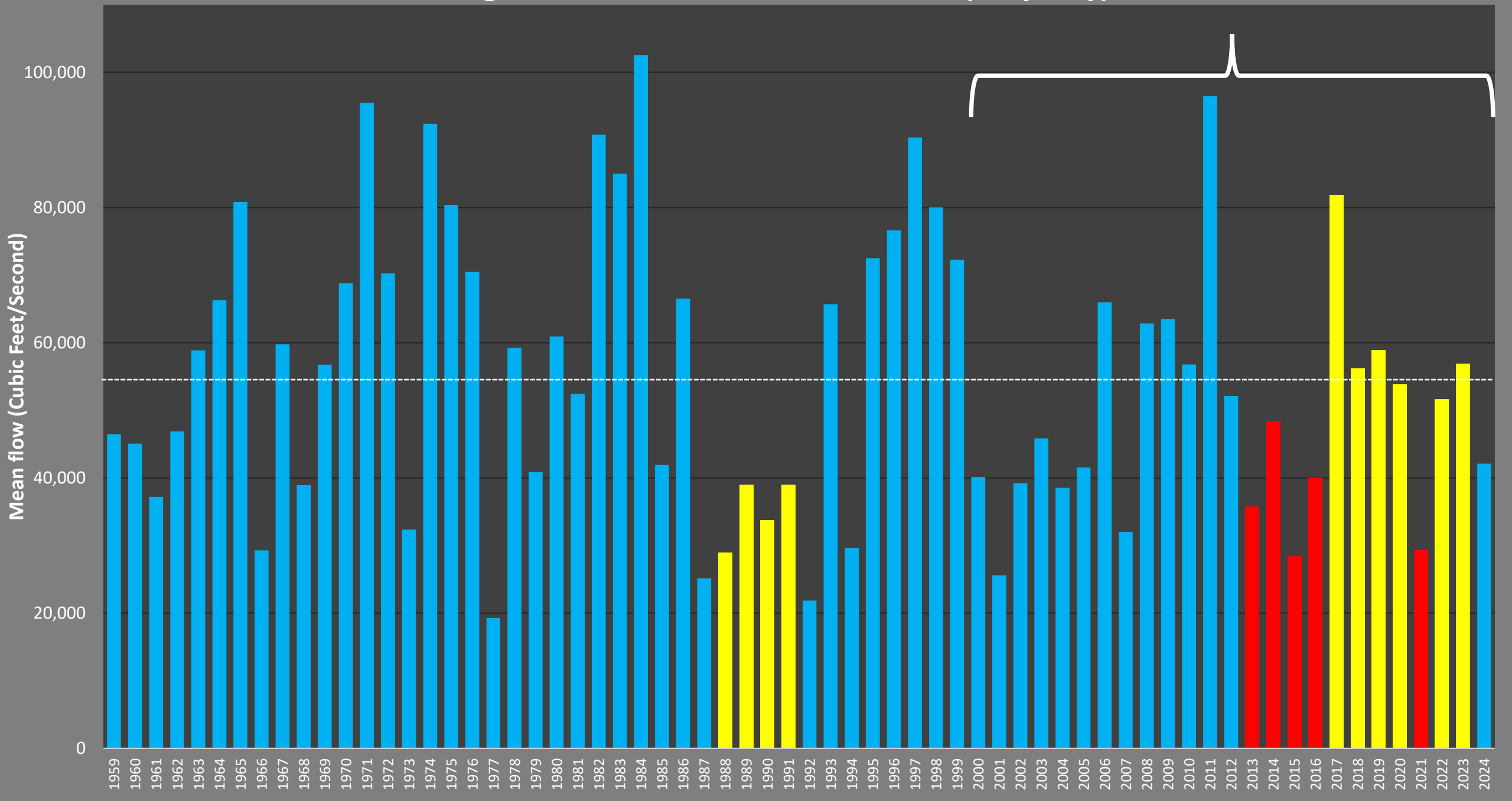
- 13 acoustic tagged adults
- 8 acoustic tagged sub-adults
- 36 with only PIT tag

Heller Bar

- 14 acoustic tagged adults
- 9 acoustic tagged sub-adults


Assessment aims: Broodstock size
Reproduction
Hatch
Drift
Effective population size
Recruitment
Gill nets
Trammel nets
Sonar
Electrofishing
Egg mats
D-nets
Visual survey
Return to spawning site
Reproduction
Gill nets
Trammel nets
Trawl
Egg mats
D-nets
On-growing
Early life stages
Gill nets
Trammel nets
Beach seine
Trawl
Out-Migration
Gill nets
Beach seine
Visual survey
Life cycle info: Habitat use
Habitat quality
Genetic population characterization
Timing and extent of migration

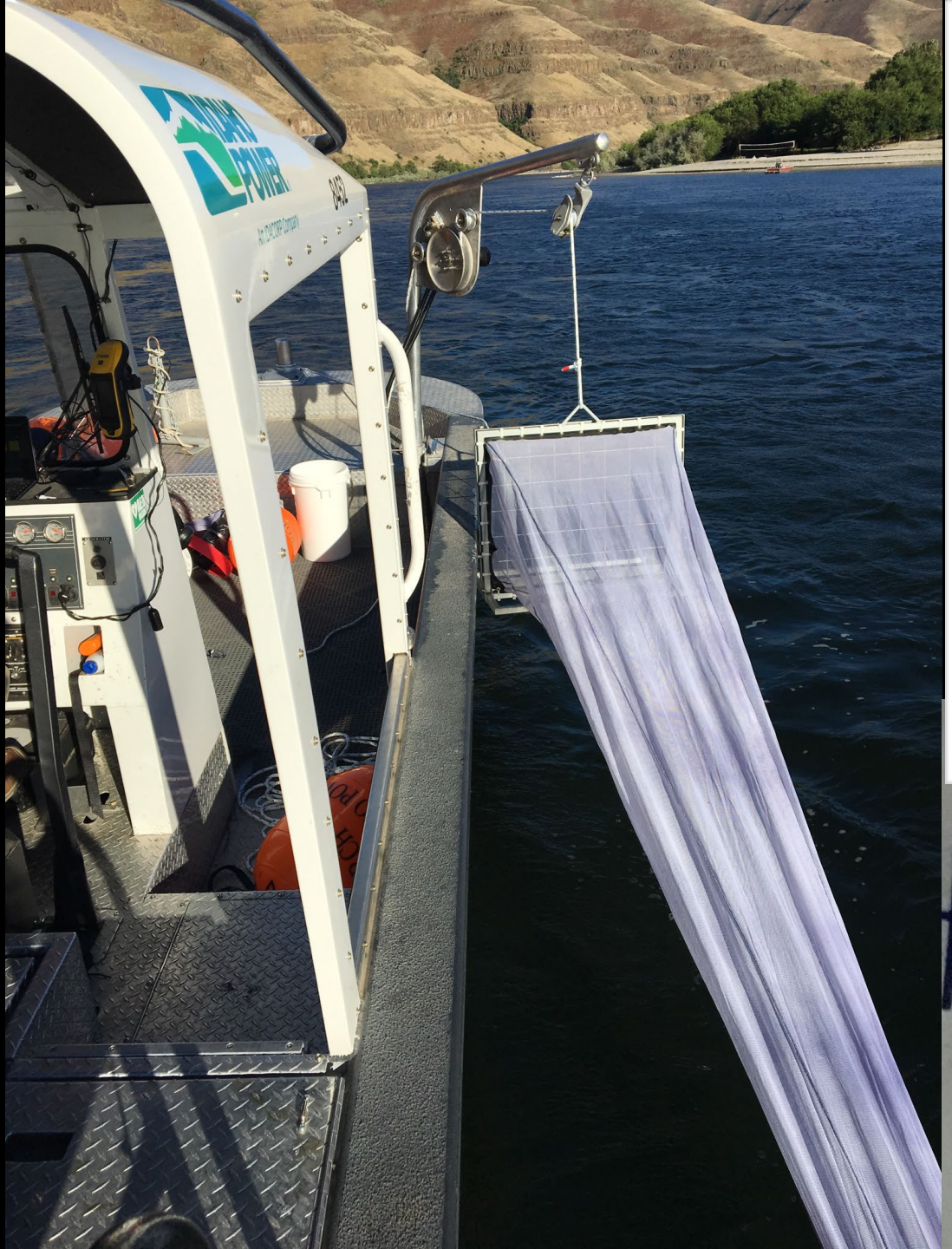
Average flow in Snake River at Anatone (May-July)

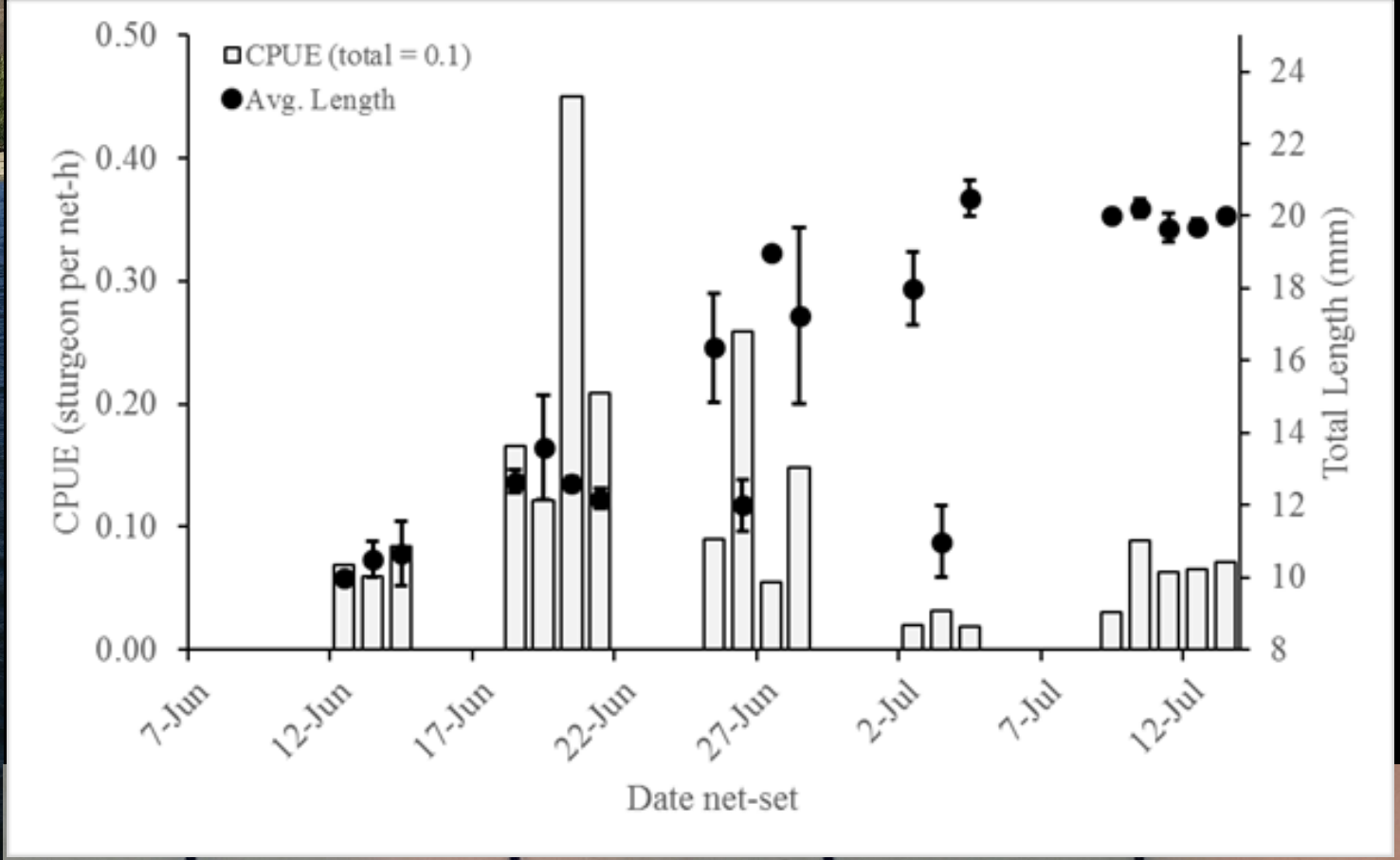


Summary

- Recruitment likely has not been sufficient to sustain the Hells Canyon White Sturgeon population since the Lower Snake River Dam Complex was completed (Lower Granite was impounded on Feb 14, 1975).
- Over 50% of each year class is believed to be entrained over Lower Granite Dam.
- Slow growth rates of juvenile sturgeon limit the number of fish that reach maturity and likely limit recruitment in the free-flowing river.
- A 33% decline is sturgeon abundance has occurred over the last 10 years in the Hells Canyon reach.
- Recent declines in sturgeon recruitment correlate with changes in the biota within the Lower Granite pool.
- We believe trap and transport (upstream and downstream) should benefit this population.
- Flows that now result in “good” recruitment have occurred twice in the last 25 years. If this continues, the only way to rebuild and maintain this population may be through a hatchery program.

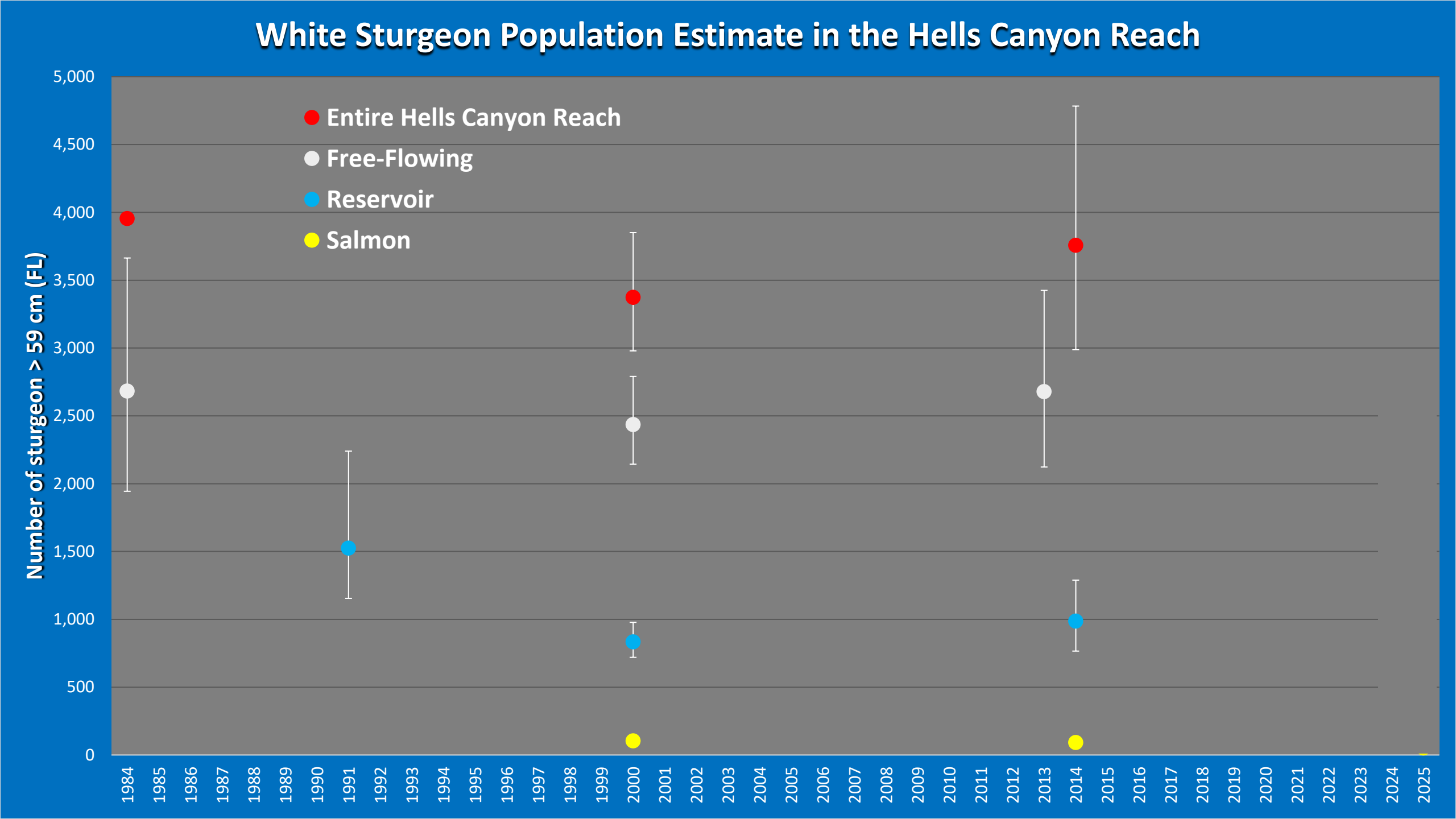
Questions?




CPUE (total = 0.1)
Avg. Length
CPUE (sturgeon per net-h)
Total Length (mm)
Date net-set
0.50
0.40
0.30
0.20
0.10
0.00
24
22
20
18
16
14
12
10
8
7-Jun
12-Jun
17-Jun
22-Jun
27-Jun
2-Jul
7-Jul
12-Jul

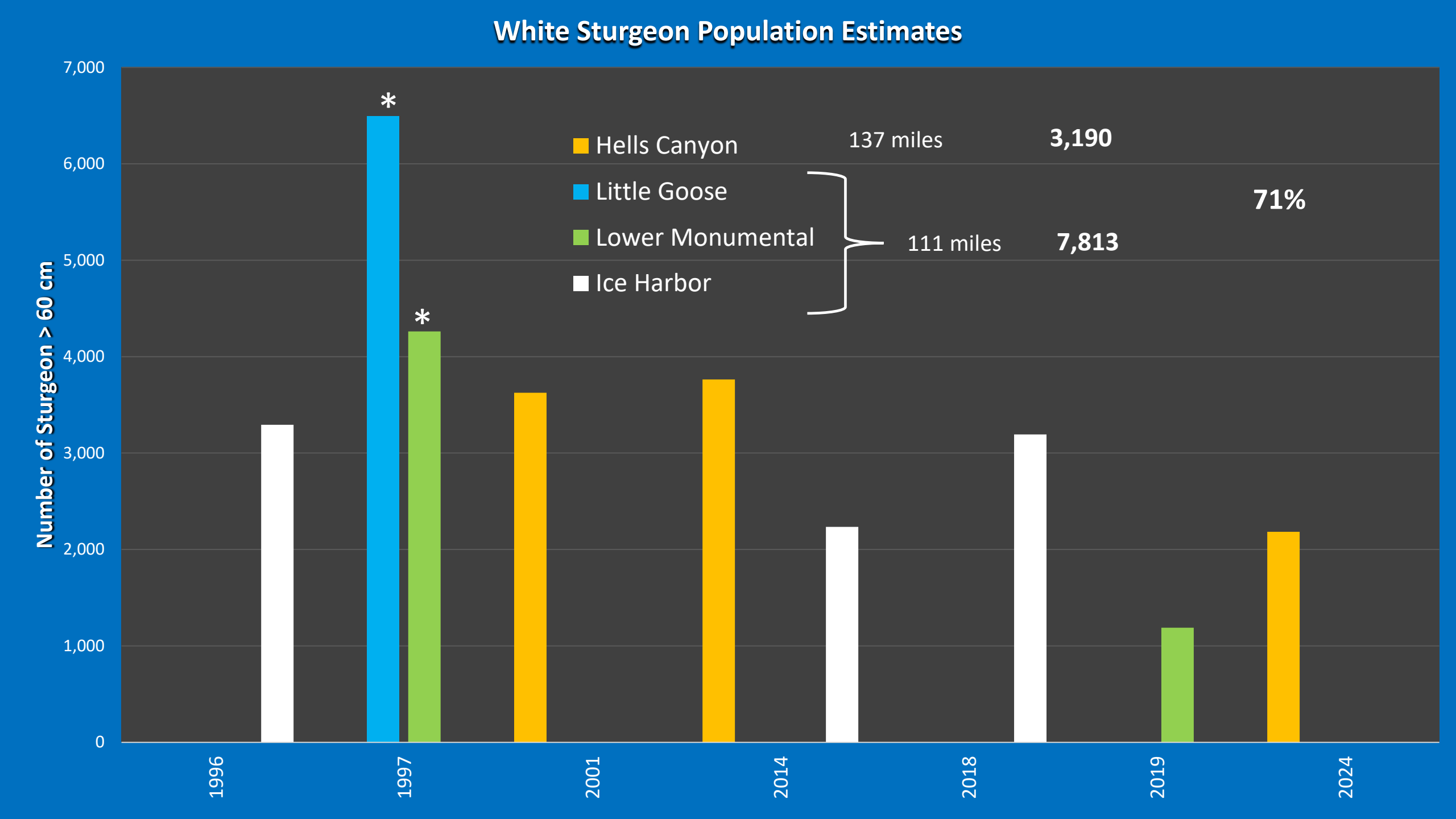

70
80
90
100

White Sturgeon Population Estimate in the Hells Canyon Reach

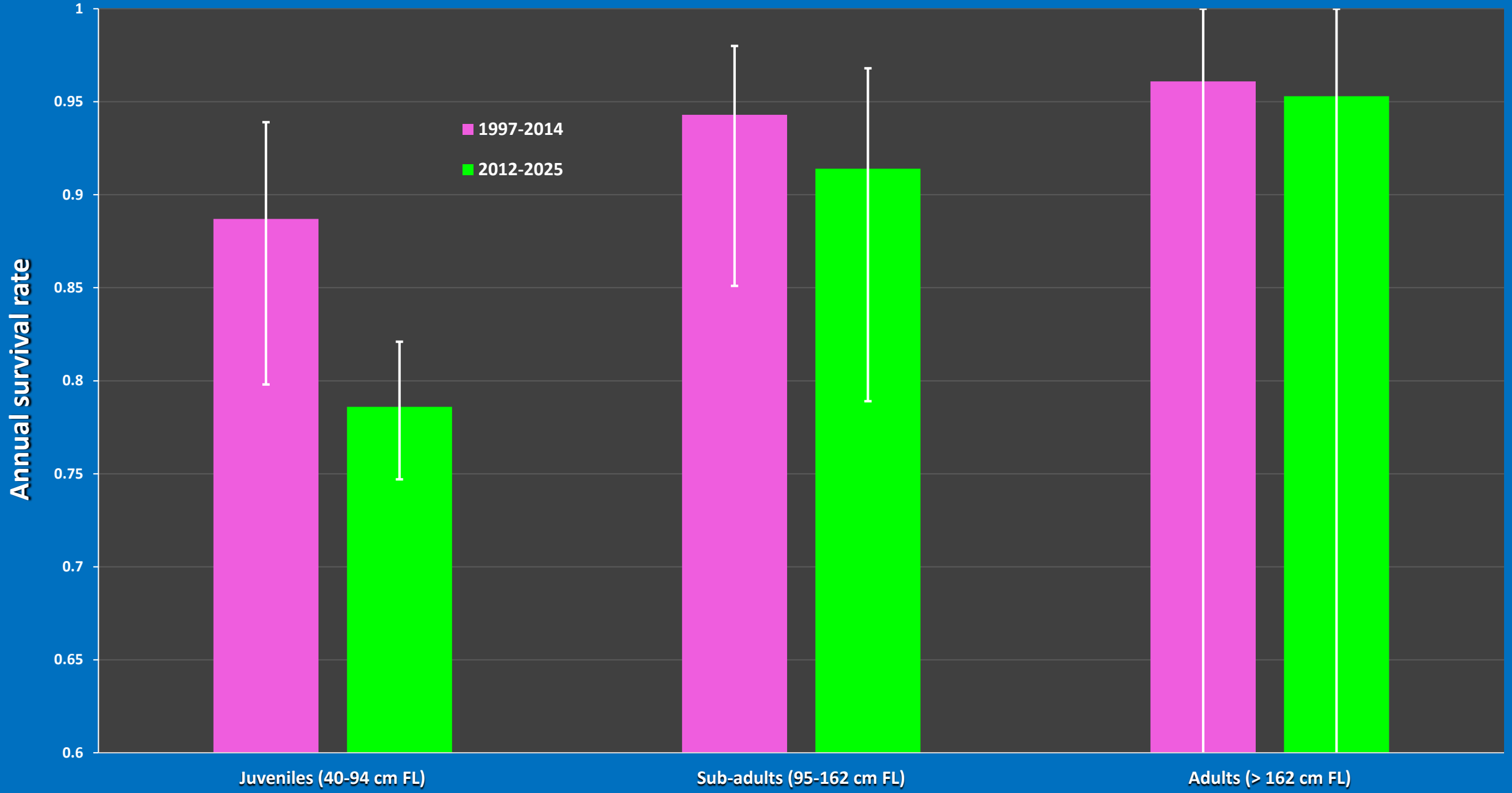


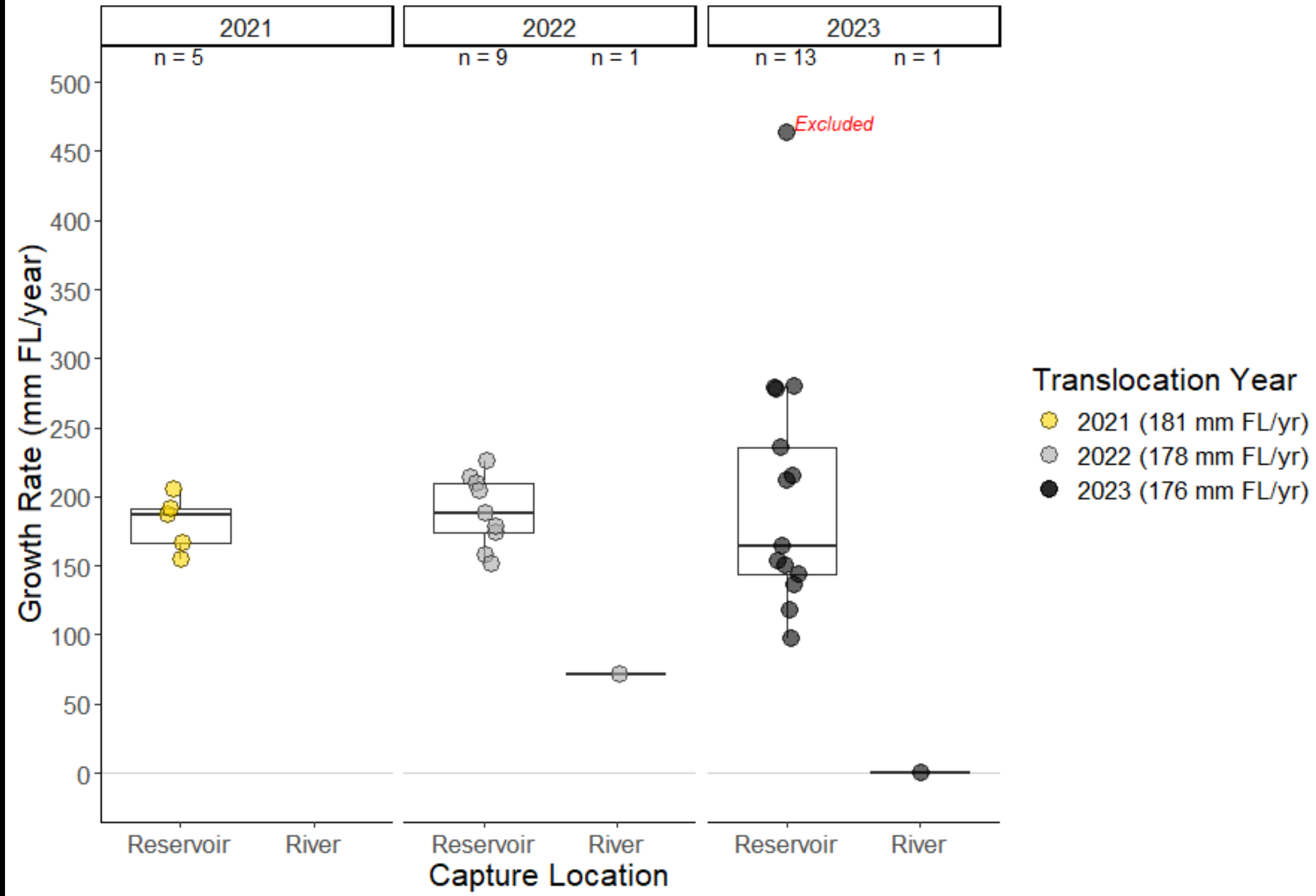
What portion of 2017 Year Class entrained?

- 293 fish PIT tagged in 2017-2018 (96% were tagged in 2018)
- 14 were detected being entrained downstream
- 20% of the Acoustic tagged fish that we know entrained also were detected by PIT arrays at the Dam
- 14/20% = 70
- 70/293 = 24% (after two runoff periods)

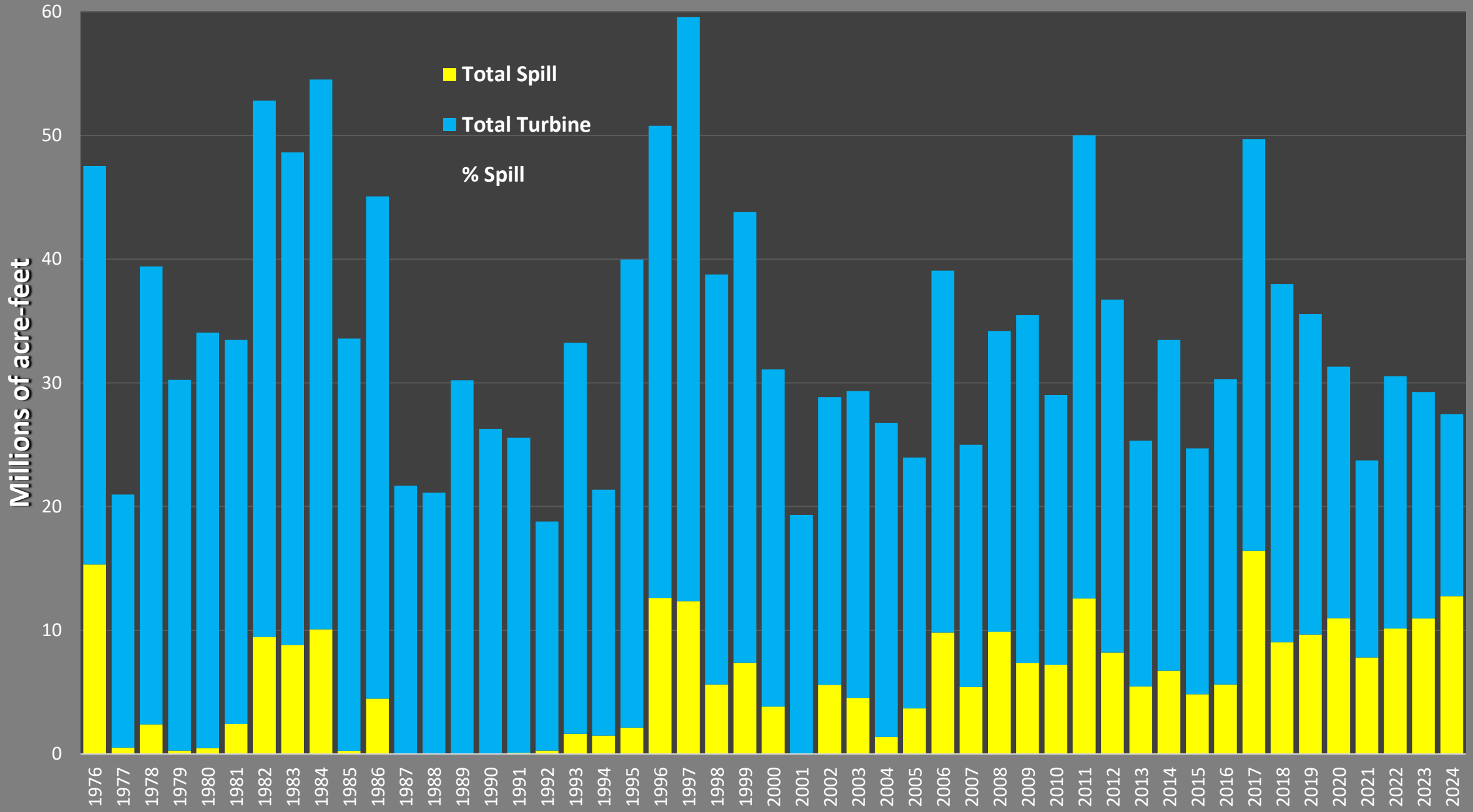

White Sturgeon Population Estimates
Number of Sturgeon > 60 cm
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1996
1997
2001
2014
2018
2019
2024
*
*
Hells Canyon
Little Goose
Lower Monumental
Ice Harbor
137 miles
3,190
111 miles
7,813
71%

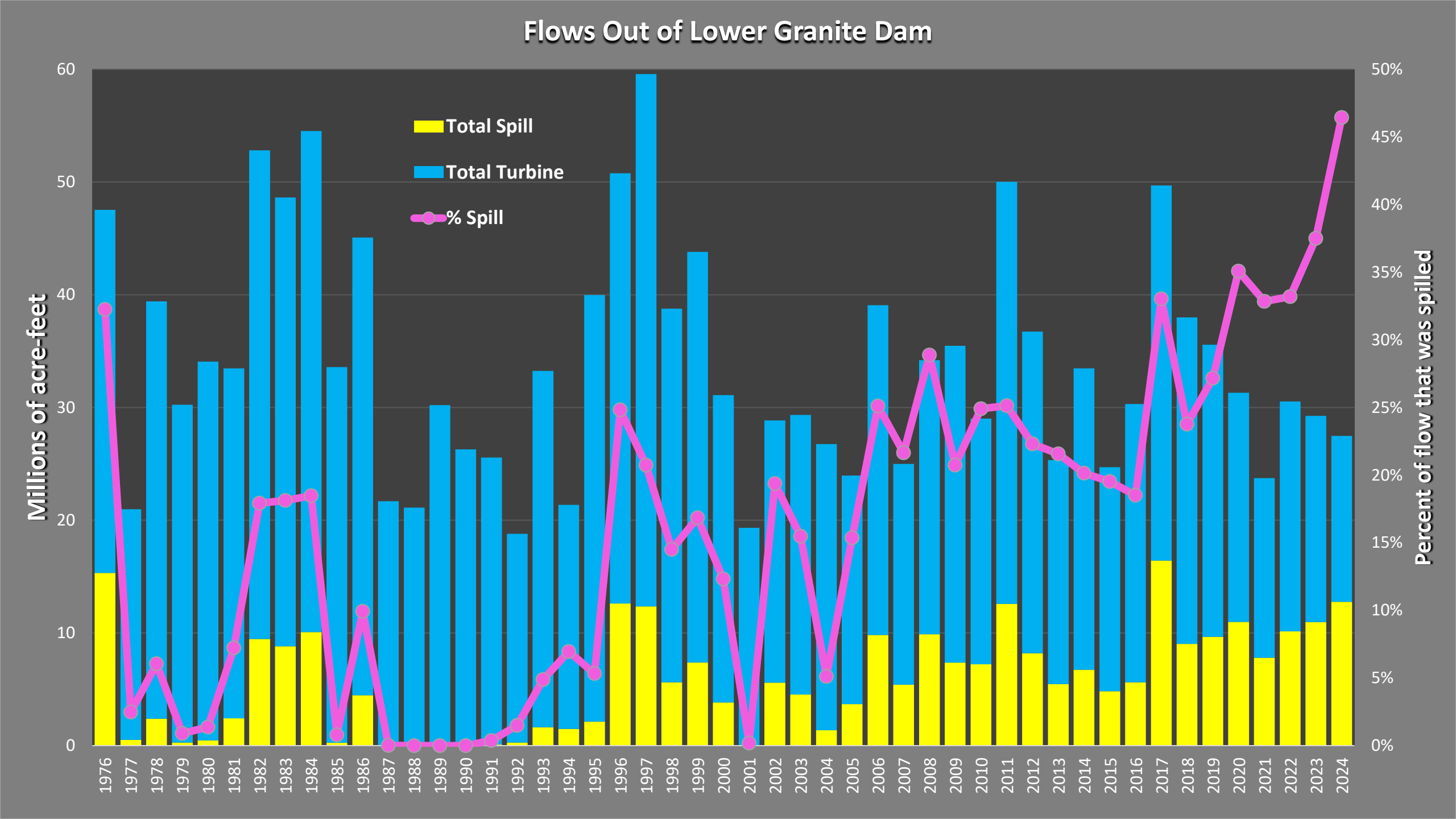
White Sturgeon Survival in Lower Granite Pool

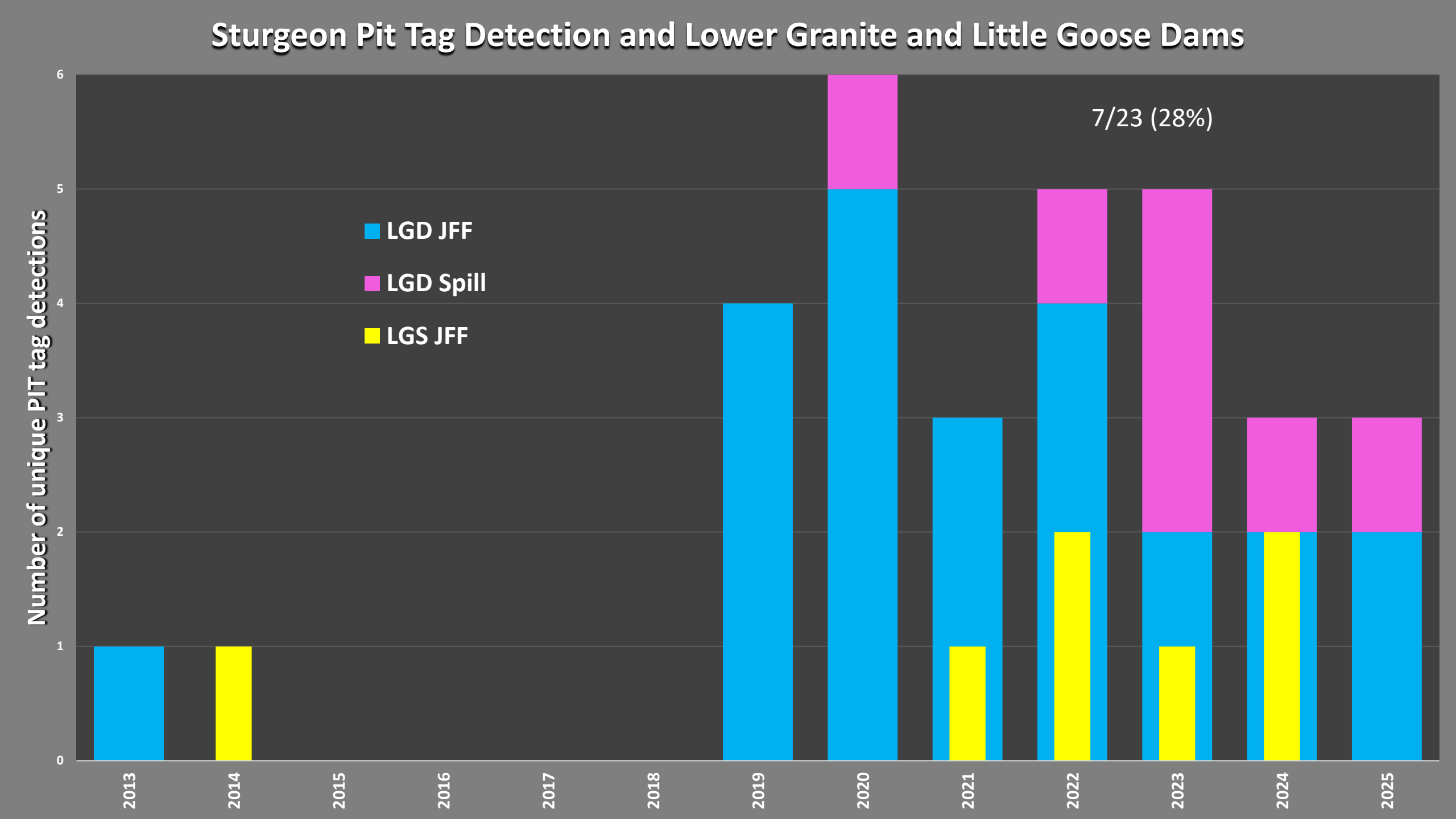


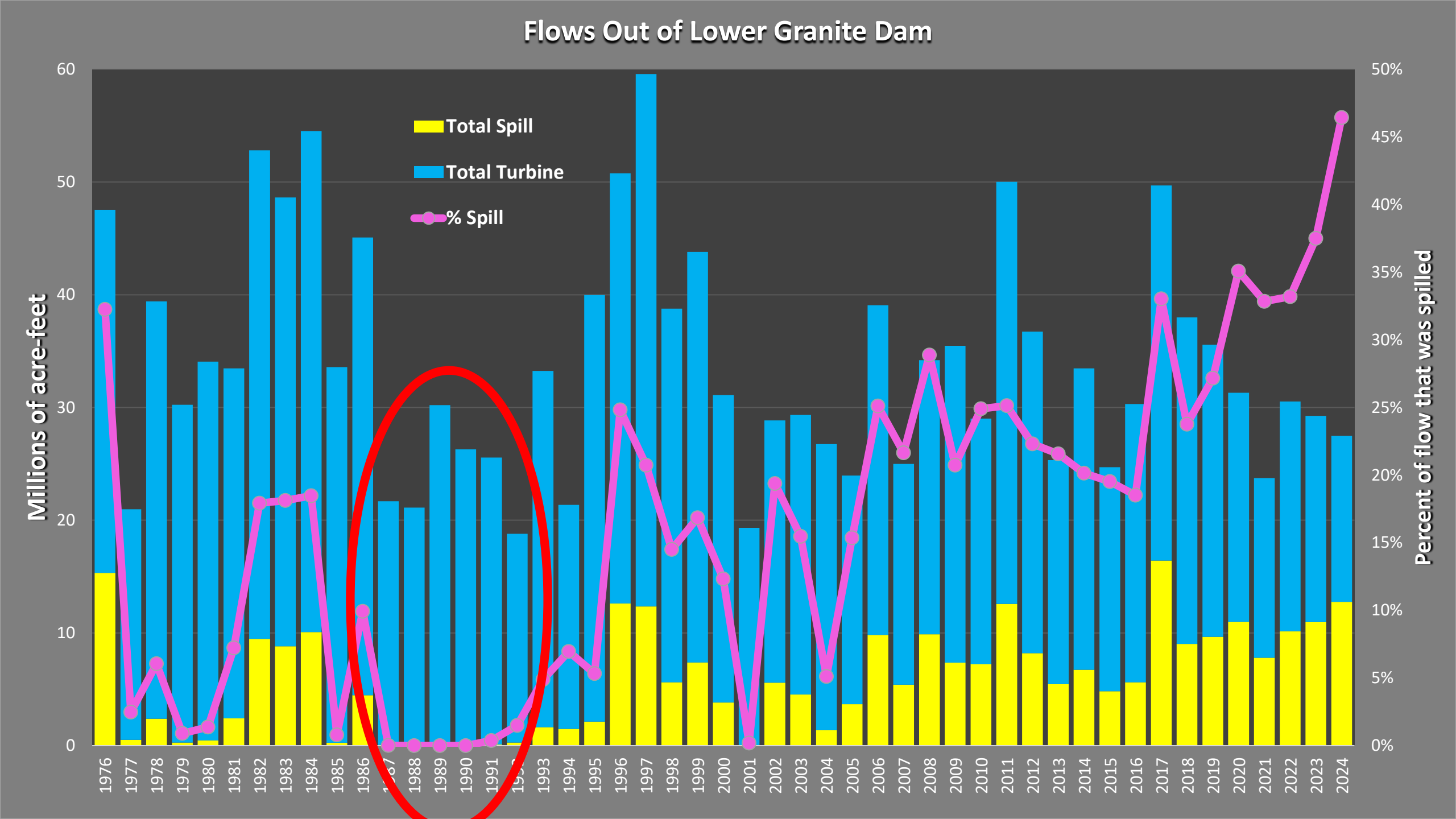

2021
2022
2023
n = 5
n = 9
n = 1
n = 13
n = 1
Excluded
500
450
400
350
300
250
200
150
100
50
0
Growth Rate (mm FL/year)
Reservoir
River
Reservoir
River
Reservoir
River
Capture Location
Translocation Year
2021 (181 mm FL/yr)
2022 (178 mm FL/yr)
2023 (176 mm FL/yr)

Flows Out of Lower Granite Dam




Flows Out of Lower Granite Dam
Total Spill
Total Turbine
% Spill
Millions of acre-feet
Percent of flow that was spilled
0
10
20
30
40
50
60
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
50%
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


Sturgeon Pit Tag Detection and Lower Granite and Little Goose Dams
Number of unique PIT tag detections
0
1
2
3
4
5
6
LGD JFF
LGD Spill
LGS JFF
7/23 (28%)
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


Flows Out of Lower Granite Dam
Total Spill
Total Turbine
% Spill
Millions of acre-feet
Percent of flow that was spilled
60
50
40
30
20
10
0
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1988
1989
1990
1991
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024