



# Review of 2020 Spill Operations

## **2020 TMT Year End Review**

Brandon R. Chockley

Fish Passage Center

December 2, 2020

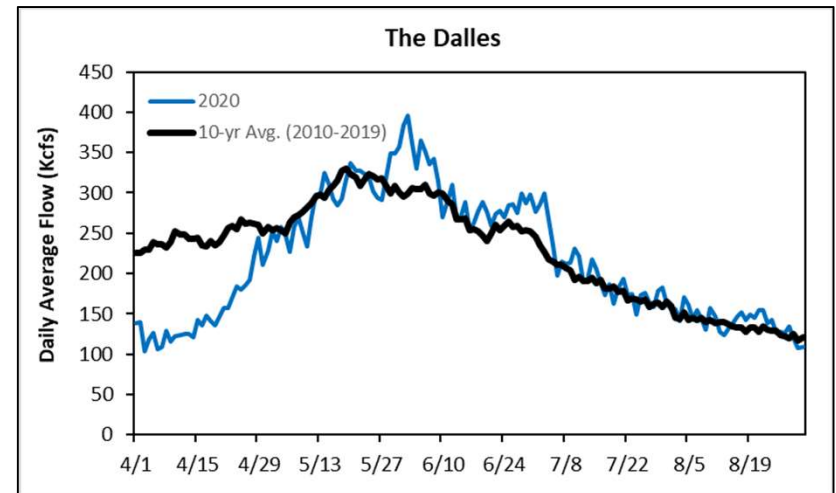
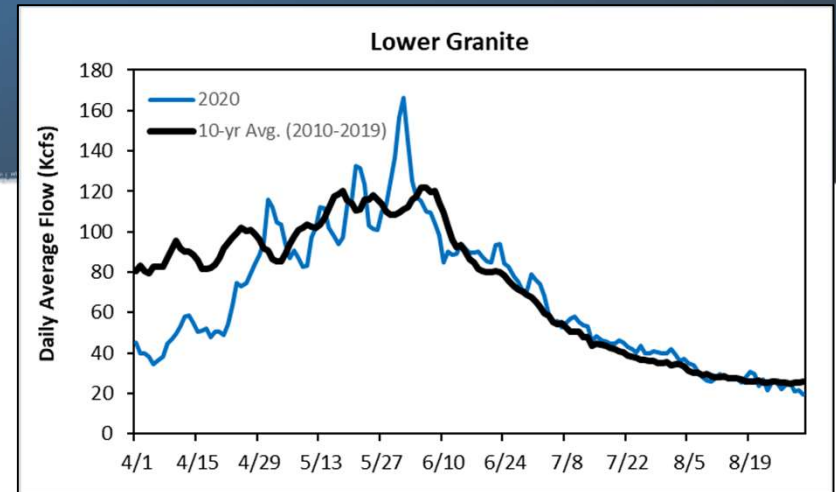
---

# Outline

- Highlights of 2020 spring Flex Spill operations
- Highlights of 2020 summer spill operations
- Results from 2020 GBT Monitoring, including pilot of non-salmonid monitoring
- 2020 Subyearling Chinook timing at LGR compared to historic average

# 2020 River Conditions

- Snake - low flows in April, average to above average in May and June, average in July and Aug.
- Mid-Columbia - low flows in April, average in May, mostly above average June and early July, average in July and Aug.
- No “uncontrolled” spill, except five days in late May/early June at BON when spill exceeded 150 Kcfs cap due to high flows



# Minimum Generation, Spill the Rest

- Due to low flows, spill targets, and/or project specific PH min requirements, meeting hourly spill targets is not always possible
  - During these times, spill is all flows in excess of PH min requirements → “Min. gen., spill the rest”
- “Min. gen., spill the rest” generally results in highest spill proportions and, therefore, lowest PH encounter rates.
- Periods of “Min. gen., spill the rest” will occur more frequently in periods of low flows and less frequently in periods of high flows
- Increases in PH min requirements cause spill proportions during “Min. gen., spill the rest” periods to decrease, increased PH passage (e.g., LGS and JDA)

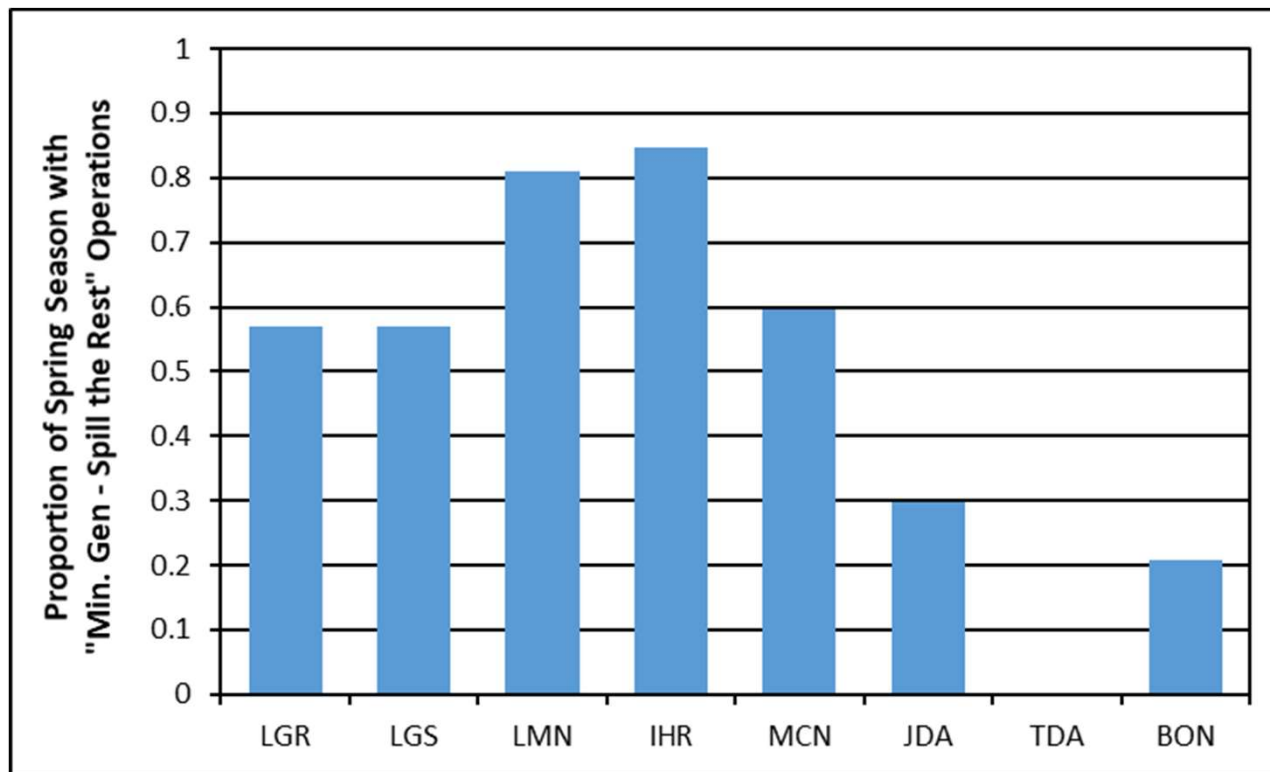
# 2020 Spring Flex Spill Operations

- Spring Spill Operations according to the 2020 FOP

Project	Estimated “Gas Cap” Spill (16 hours)	Performance Standard Spill (8 hours)
Lower Granite (LGR)	125% TDG Spill Cap	20 Kcfs
Little Goose (LGS)	125% TDG Spill Cap	30%
Lower Monumental (LMN)	125% TDG Spill Cap	30 Kcfs
Ice Harbor (IHR)	125% TDG Spill Cap	30%
McNary (MCN)	125% TDG Spill Cap	48%
John Day (JDA)	120% TDG Spill Cap	32%
The Dalles (TDA)	40% of Instantaneous Flows	
Bonneville (BON)	150 Kcfs	100 Kcfs

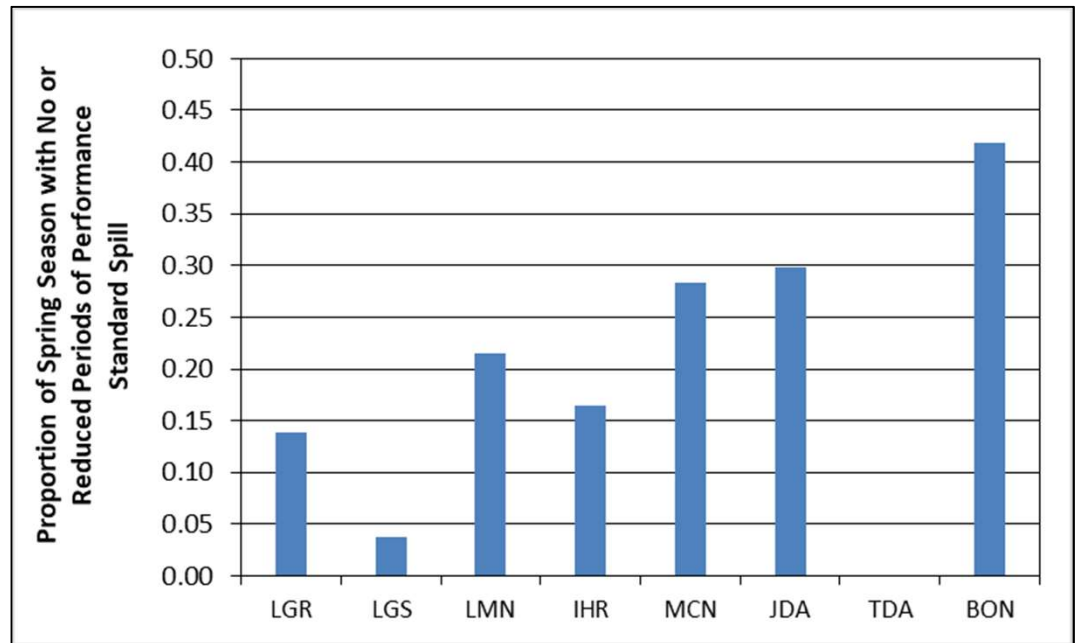
# Spring: Minimum Generation, Spill the Rest

- In spring, “Min. gen., spill the rest” occurred at nearly all projects



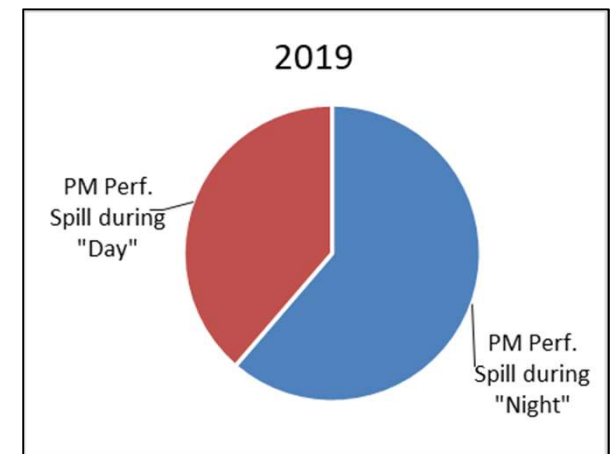
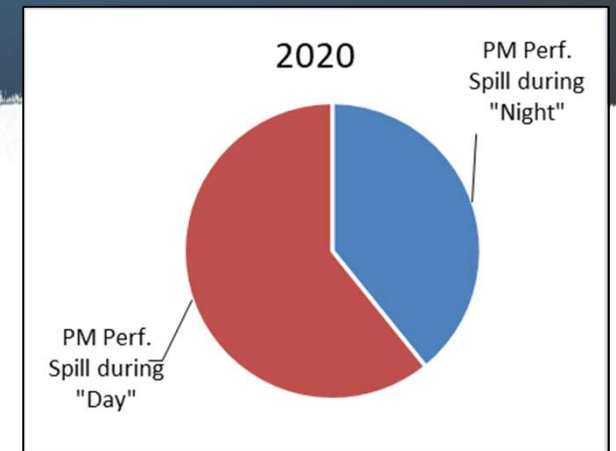
# Spring: Lack of Load and Reduced or No Performance Standard Spill Periods

- Some level of performance standard spill was provided over most of the spring season
- Lack of load led to periods of reduced or no performance standard spill throughout spring
  - Amount was variable between projects



# Spring: Performance Standard Spill During Nighttime Hours

- 2020 Flex Spill Agreement added limitations to nighttime Performance Standard spill periods:
  - Max 5 hours between sunset and sunrise
  - Not between 2200 hours and 0300 hours
- 39.2% of PM performance standard spill hours occurred during evening/dark.
  - Decrease from 2019 → 61.3% of PM performance standard spill hours occurred at “night”



# Spring: In-season Modifications

- Several in-season modifications occurred at LGS and LMN
  - PH Min at LGS reduced during “gas cap” periods to maximize spill during these periods
  - Three modifications to address concerns over long adult Chinook travel times in the Lower Snake River
    1. ASW Operations at LGS
    2. Timing of Performance Standard Spill at LMN
    3. Spill Pattern at LMN

---

## Spring: In-season Modifications cont'd

- SOR for additional Performance Standard spill hours at LGS and additional “gas cap” hours at LGR was introduced but later rescinded

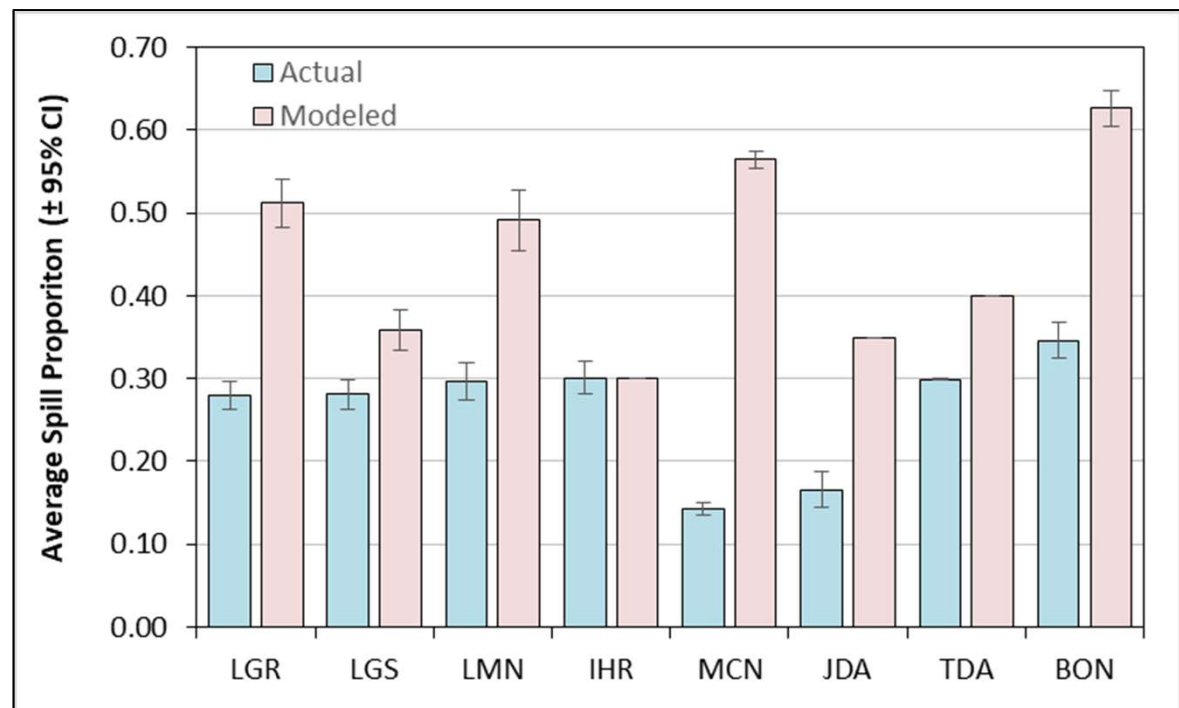
# 2020 Summer Spill Operations

- Summer spill ops. began in similar fashion as recent years
- One major change from past years was a transition to different spill operations for last half of August

Project	Snake: June 21-Aug. 14 Mid-Columbia: June 16-Aug. 14	After August 15 (Aug. 15 – Aug. 31)
Lower Granite (LGR)	18 Kcfs	SW or ~7 Kcfs
Little Goose (LGS)	30%	SW or ~ 7 Kcfs
Lower Monumental (LMN)	17 Kcfs	SW or ~7 Kcfs
Ice Harbor (IHR)	30%	SW or ~8.5 Kcfs
McNary (MCN)	57%	20 Kcfs
John Day (JDA)	35%	20 Kcfs
The Dalles (TDA)	40%	30%
Bonneville (BON)	95 Kcfs	50 Kcfs

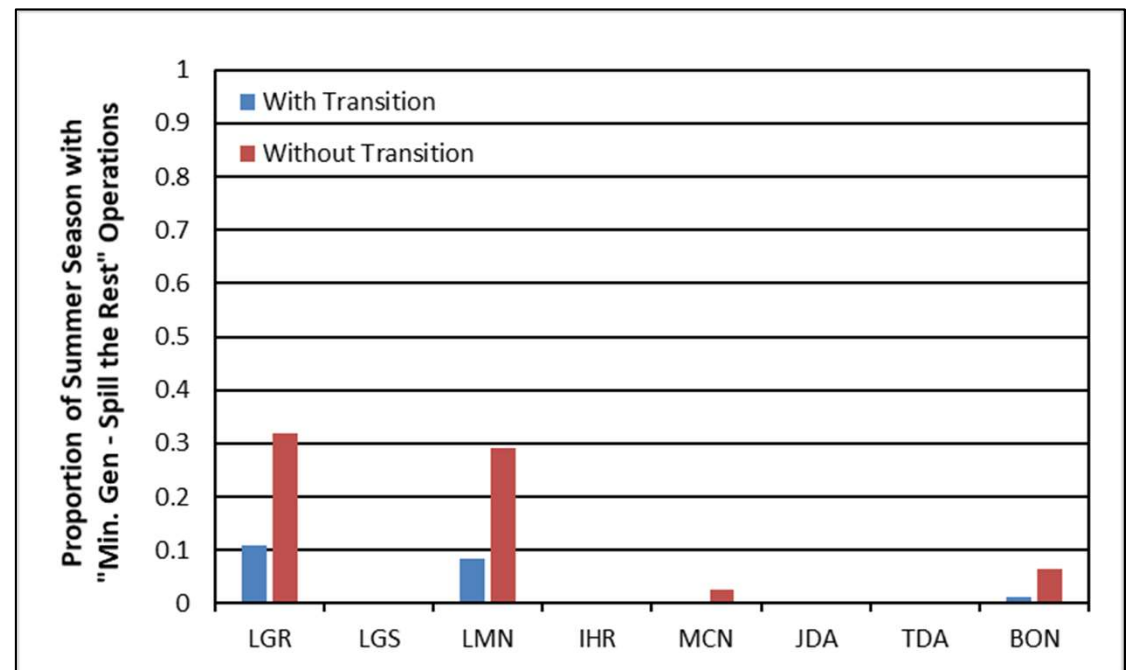
# Summer Spill Proportions

- Transition in spill ops. on Aug 15 resulted in reductions in average spill proportion, compared to if transition had not occurred
  - Largest reduction occurred at MCN
  - No net change at IHR due to low flows over Aug 15-31 period



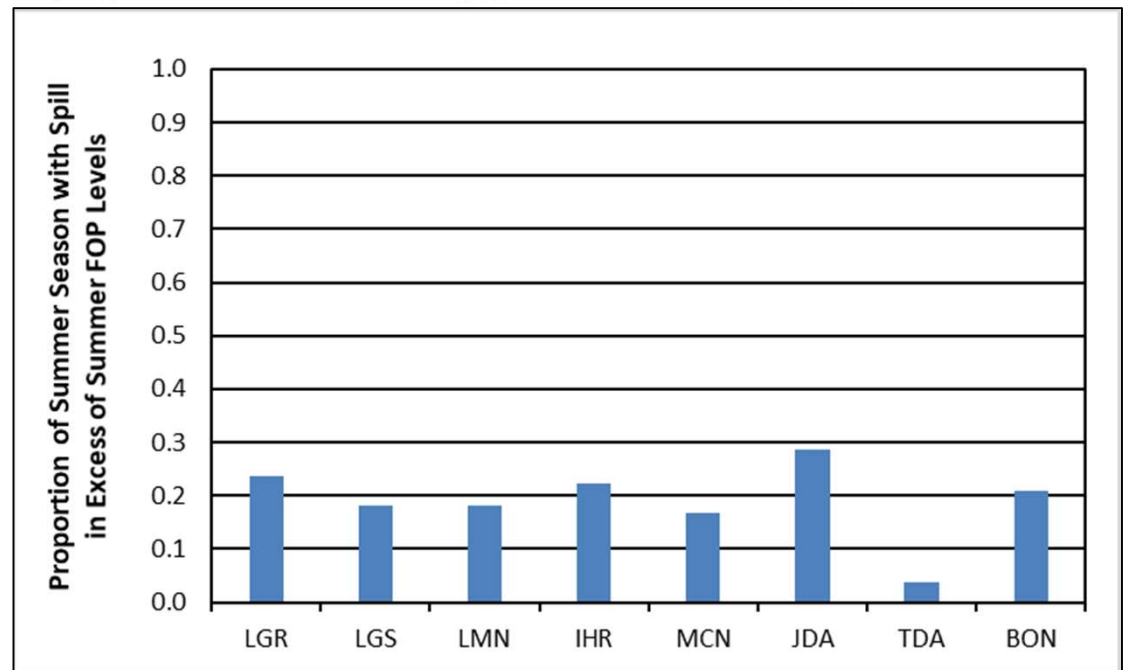
# Summer: Minimum Generation, Spill the Rest

- In summer, “Min. gen., spill the rest” occurred infrequently and at only three sites
- In absence of Aug. 15 transition, occurrences of “Min. gen., spill the rest” would have increased at LGR, LMN, and BON and would have seen few occurrences at MCN



# Summer: Excess Spill due to Lack of Load, Doble Testing, or Limited PH Capacity

- Lack of load, Doble Testing, and/or Limited PH Capacity resulted in periods of spill in excess of summer FOP levels
- Periods mostly confined to late June-early July



---

## Summer: In-season Modifications

- SOR 2020-5 - RSW at LGR was operated for entire summer spill period to facilitate evaluations of subyearling Chinook passage route selection

# 2020 GBT Monitoring

- Nearly 9,600 salmonids examined for GBT at five FCRPS projects in 2020
- Daily salmonid GBT incidence rates in spring ranged from 0.0%-20.0%
  - Single incident of 20% GBT based on five examined fish, no action taken
  - Otherwise, daily GBT rates generally in 0.0%-6.3% at FCRPS projects
- Among GBT samples that met 50 fish minimum, action criteria never met

---

# 2020 GBT Monitoring

- Conducted pilot GBT monitoring on non-salmonids during spring at five FCRPS projects
  - 36 total non-salmonids were encountered and examined
  - Zero signs of GBT observed
  - Meeting non-salmonid sample size requirements with current GBT program is not possible

# 2020 Subyearling Chinook Passage Timing at LGR

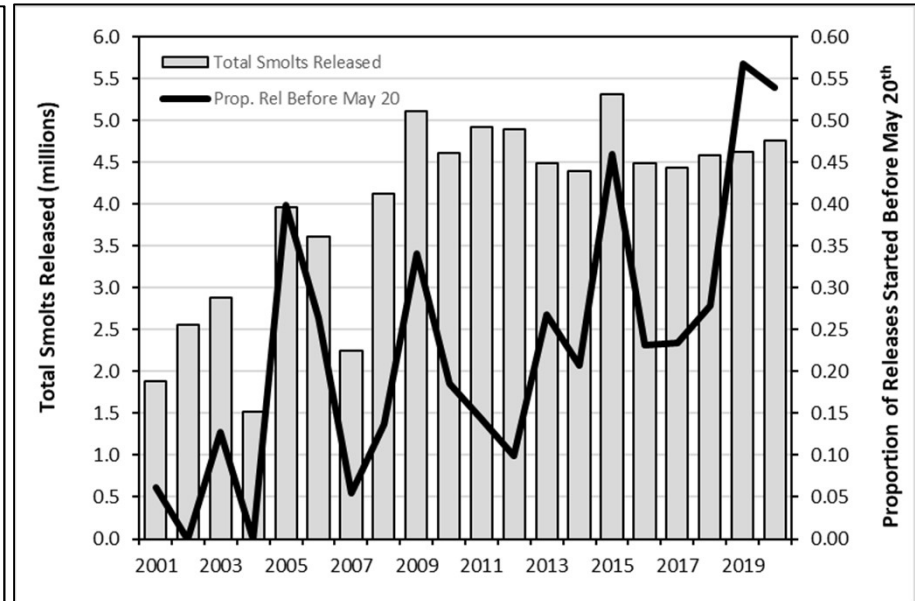
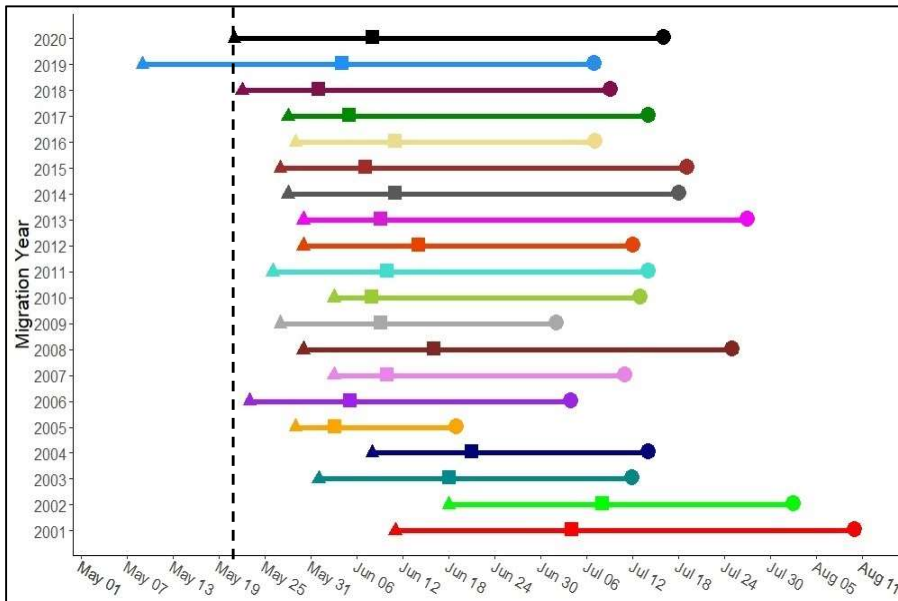
- Transportation operations changed in 2020
  - Cessation of barging from June 22-August 1
  - Collections for trucking resumed at LGR and LGS on August 2<sup>nd</sup> and continued through the end of October
  - No trucking from LMN
- FPC estimated passage timing of CH0 at LGR in 2020 compared to past years and estimated proportions passing during key periods in 2020
  - Timing for this presentation based on complete 2020 sampling

# Factors Affecting Passage Timing

- When evaluating passage timing, important to consider many management actions and physical and operational factors that can affect timing
  - Hatchery release schedules and magnitudes
  - Temperatures – lower temperatures can cause delay in out-migration timing (i.e., later timing)
  - Flows - increases in flows → shorter travel times
  - Spill – increases in spill proportions → shorter travel times
  - Shorter travel times → earlier timing
  - Survival

# Subyearling Chinook Timing at LGR 2020 vs. Historic

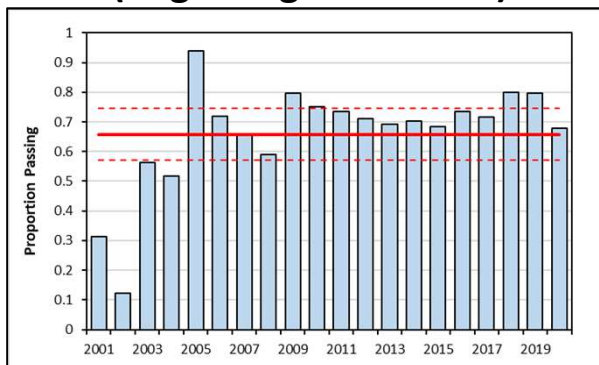
- “Arrival” timing 2<sup>nd</sup> earliest over last 20 years
- Largely due to changes in hatchery release schedules beginning in 2019 with larger proportion released in early May



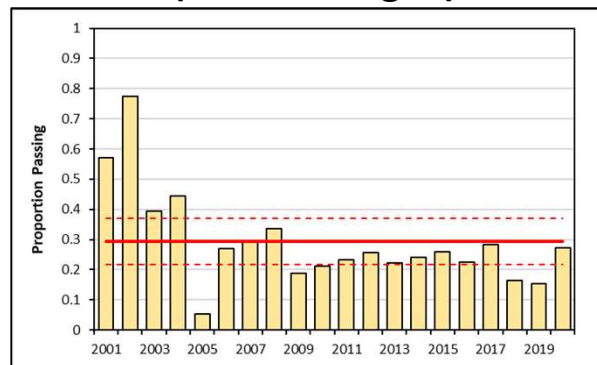
# Subyearling Chinook Timing at LGR Cumulative Passage During Periods of Interest

- Over three periods of transportation operations, 2020 cumulative proportions passing were all similar to historic averages

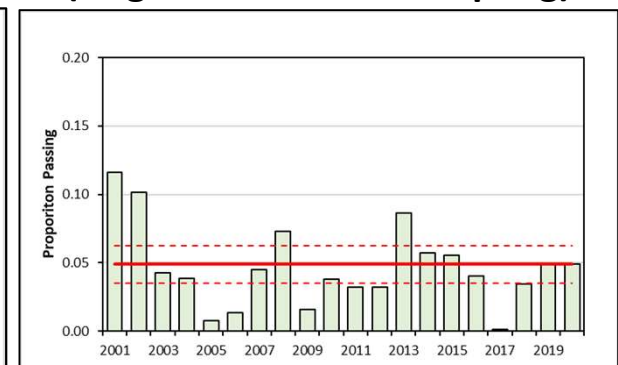
**Pre-transport + Barging  
(Beginning – June 21<sup>st</sup>)**



**No Transport  
(June 22-Aug. 1)**



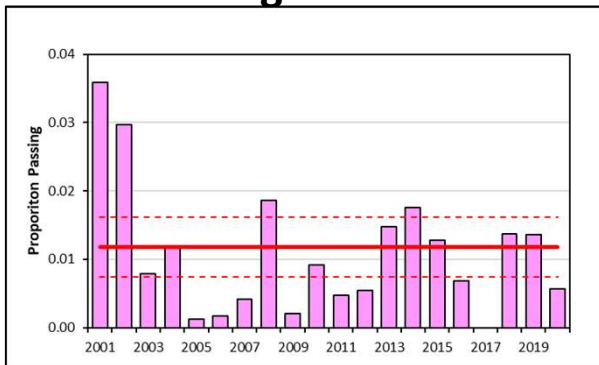
**Trucking from LGR & LGS  
(August 2 – End of Sampling)**



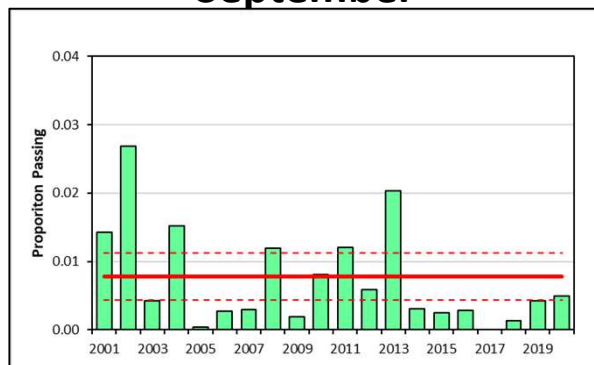
# Subyearling Chinook Timing at LGR Cumulative Passage During Periods of Interest Cont'd...

- Some differences in cumulative proportion passing later in season
  - Aug 15-31 (reduced spill) – 2020 passage notably lower than historic avg.
  - Sept. – 2020 passage among lowest
  - Oct. – 2020 passage notably higher than historic average

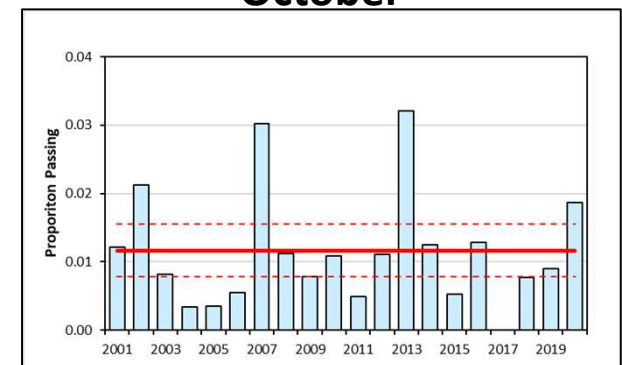
**Aug 15-31**



**September**



**October**



---

## Up Next....

- Jerry McCann (FPC) will talk about other juvenile passage metrics in 2020 spring and summer