Walleye Collection at Lower Granite Dam: 2020

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Walleye in the Columbia River basin

- Unauthorized introduction into Lake Roosevelt ca. 1960
  - Spread downstream and then up the Snake River ~1960 – present
- Why is this a problem?
  - Estimated smolt consumption from a 1998 evaluation in the lower three CR reservoirs was up to 2 million smolts per year
  - Sampling by ODFW, WDFW, and PSMFC in the Lower Snake showed that smolts comprised 36% of stomach contents, but n=1 in LGS, and n=0 in LWG
- Walleye were first encountered at the Lower Granite Dam adult trap in 2016 and encounters have increased.
- IDFG has long been concerned about walleye in the Snake River above Lower Granite

Characterizing walleye dispersing above Lower Granite

- Little knowledge of the characteristics of walleye in the upper two Lower Snake Reservoirs
  - Recent efforts suggest electrofishing may not be effective for sampling walleye in these reservoirs
- IDFG lethally sampled 100% of walleye captured in the Lower Granite Dam adult trap in 2020
  - Fork length /weight
  - Otoliths (aging and potention microchemistry analysis)
  - Dorsal fin rays (secondary aging structure
  - Stomach content (diet analysis)
  - Gonads (sex and development)
  - Fin tissue (IDFG research into walleye genetic sex markers)

Sample rates and number

Date	Days/week	Trap rate	Sample rate
Jul 02 – 31	5	28%	20%
Aug 1 – 17	5	25%	18%
Aug 18 – Sep 01	7	80%	80%
Sep 02 – Nov 12	7	18%	18%

Table 1. Number of samples collected from Walleye (*Sander vitreus*) at the Lower Granite Dam adult trap from July 16, 2020 to October 24, 2020.

Sex	Otolith	Gut content	Fin ray	Fin tissue
Male	32	36	36	34
Female	5	9	9	9
Total	37	45	45	43

Results: abundance

- 45 encountered, estimated 165 passed the fish ladder

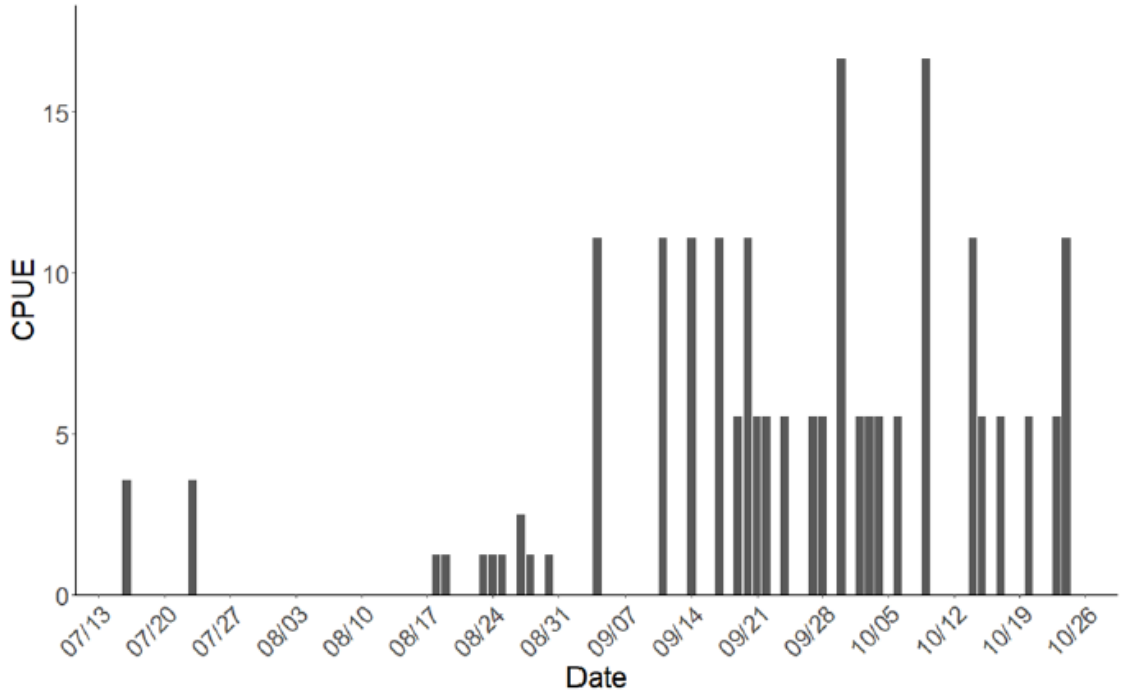

Figure 1. Number of Walleye (*Sander vitreus*) collected at Lower Granite Dam from 7/16/2020 to 10/24/2020 by sampling date and CPUE. CPUE was calculated using number of Walleye sampled and daily trap rate.

Results: characteristics

- 20% Female
- 80% Male
- Mean Fork length = 43.2cm; range 24.5-55.2cm

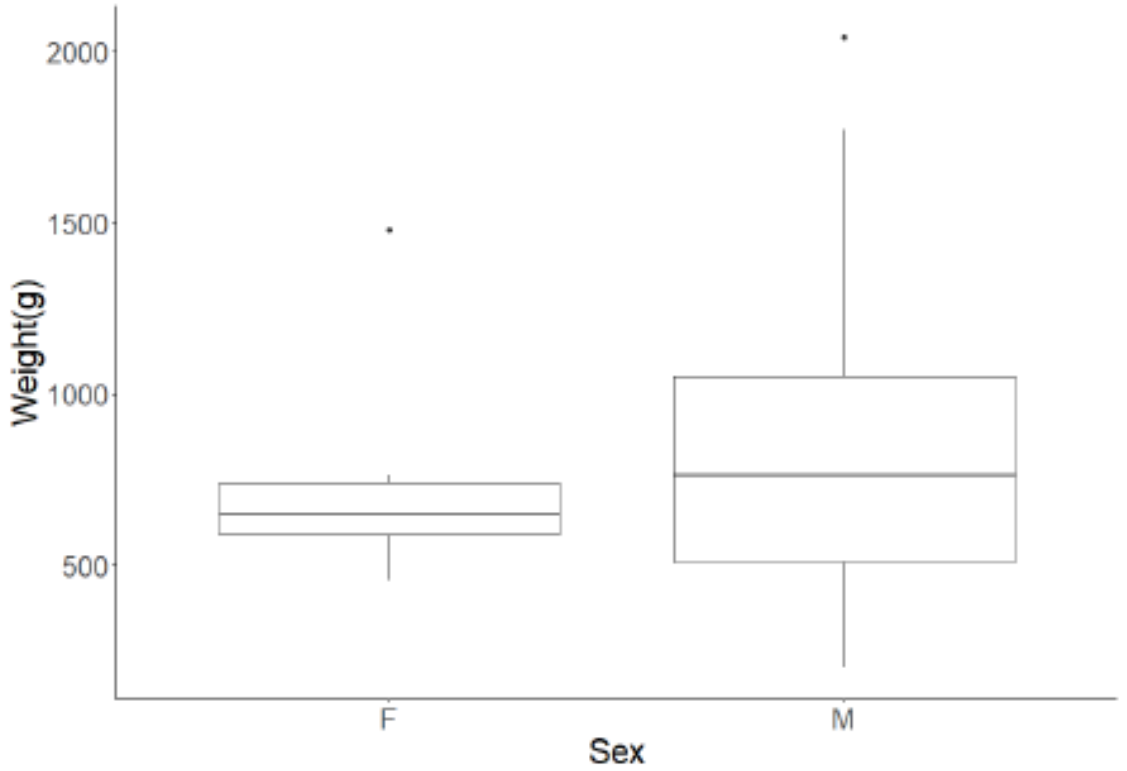

Figure 5. Box plot of weight of male (M) and female (F) Walleye (*Sander vitreus*) collected at Lower Granite Dam from 7/16/2020 to 10/24/2020.

Results: Gonad development

- 40% under developed
- 18% developing
- 31% fully developed

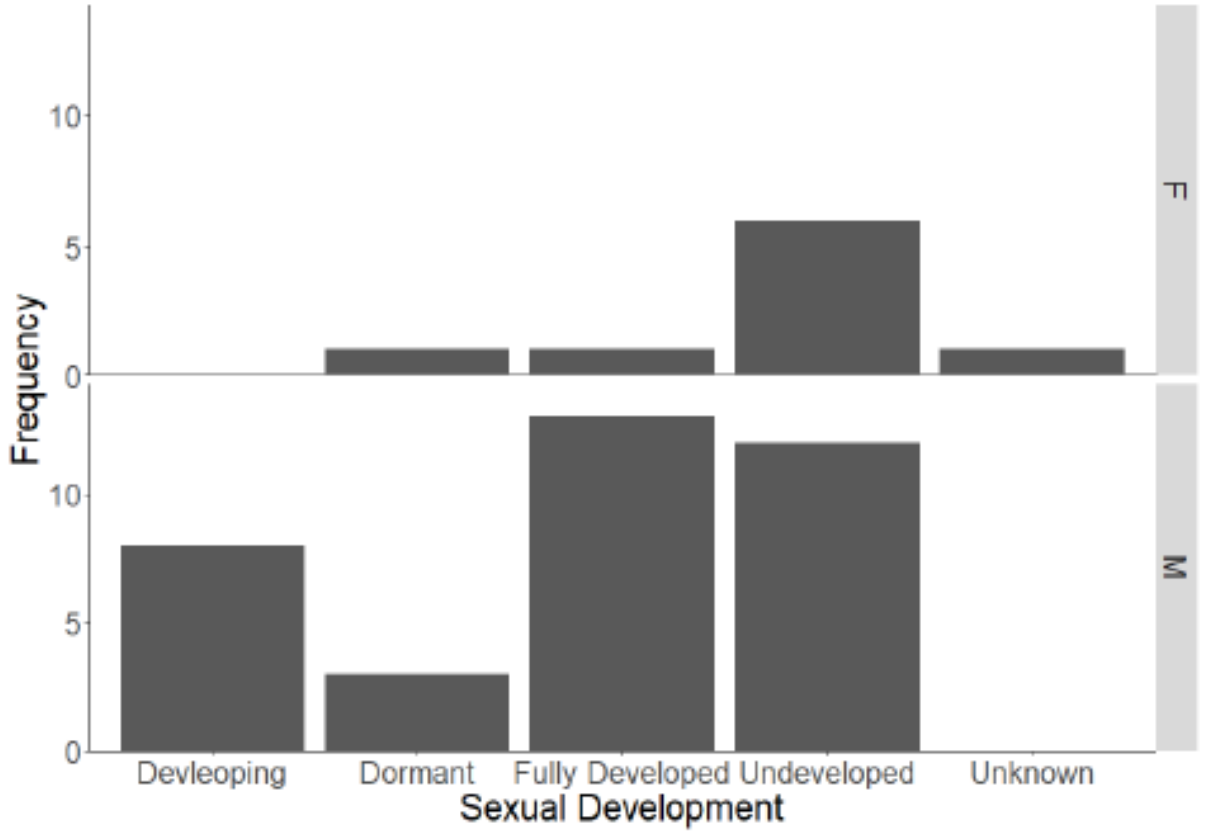

Figure 6. Sexual development of male (M) and female (F) Walleye (*Sander vitreus*) in accordance with *NWST Field Guide: Identification of Sex, Maturity, and Gonad Condition of Walleye* (2000) collected at Lower Granite Dam from 7/16/2020 to 10/24/2020.

Conclusions

- We are documenting the colonization of habitats by a non-native predator
- Mostly male: higher exploratory movements of males relative to females?
- Low rates of sexual development despite large size
  - Low growth rates limiting development?
  - Dispersal driven by poor body condition?
  - Both plus ladder limitations

Next steps

- Continue sampling in 2021
- Analyze ages of 2020 samples
- Add walleye to the window counts at Lower Granite
- Where are these fish going?