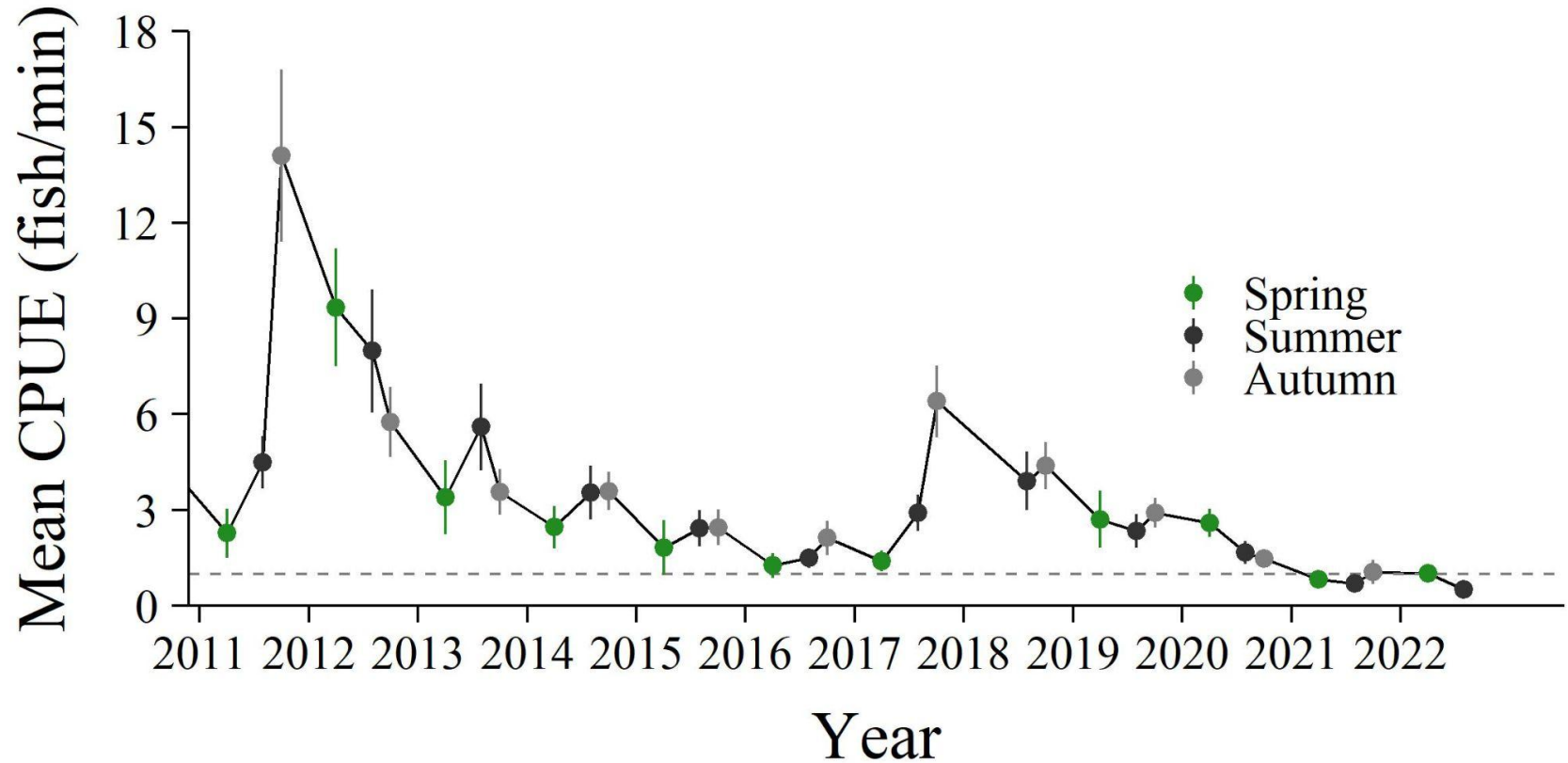


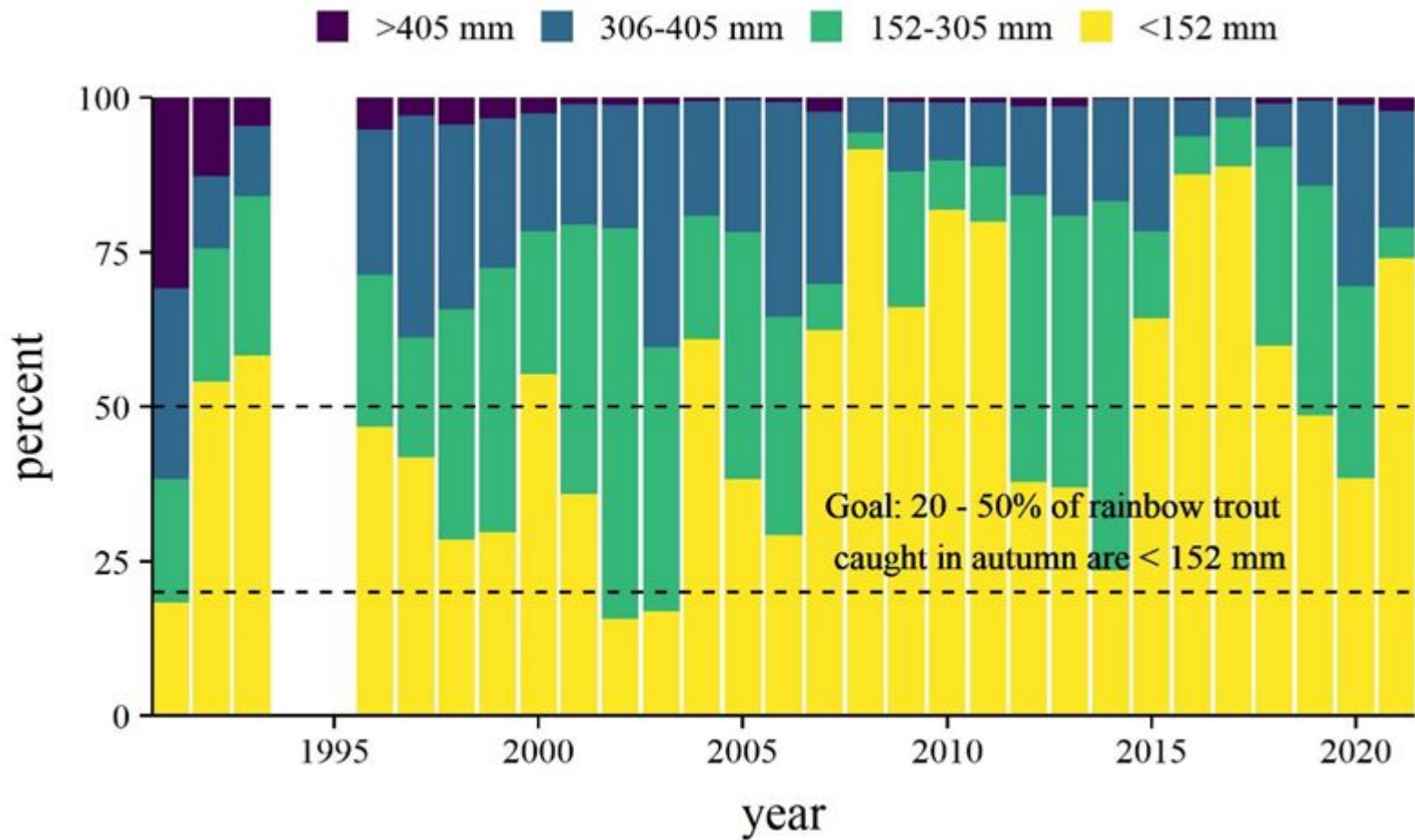


Lees Ferry Rainbow Trout Fishery- Status Update and Discussion of Threats

Ryan Mann, Aquatic Research Program Manager
Research Branch
GCDAMP Technical Working Group, October 2022

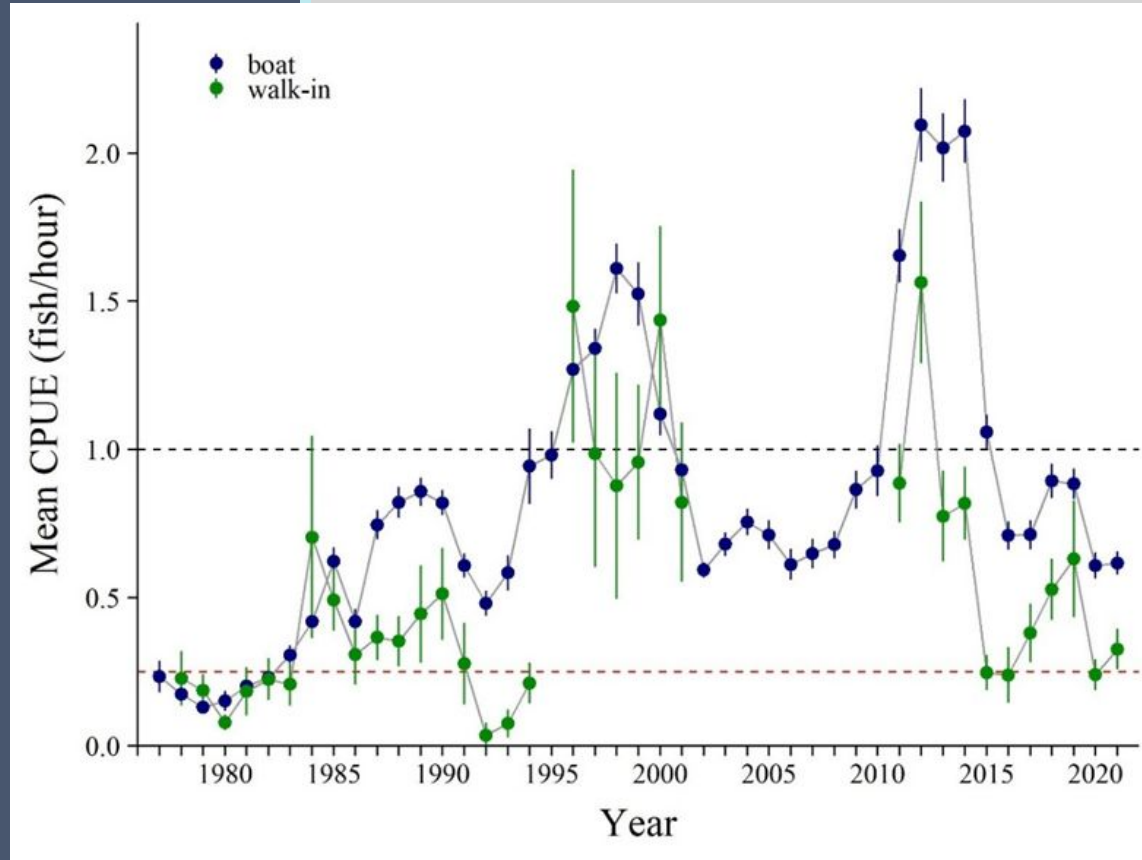
Status of the Fishery - In Decline



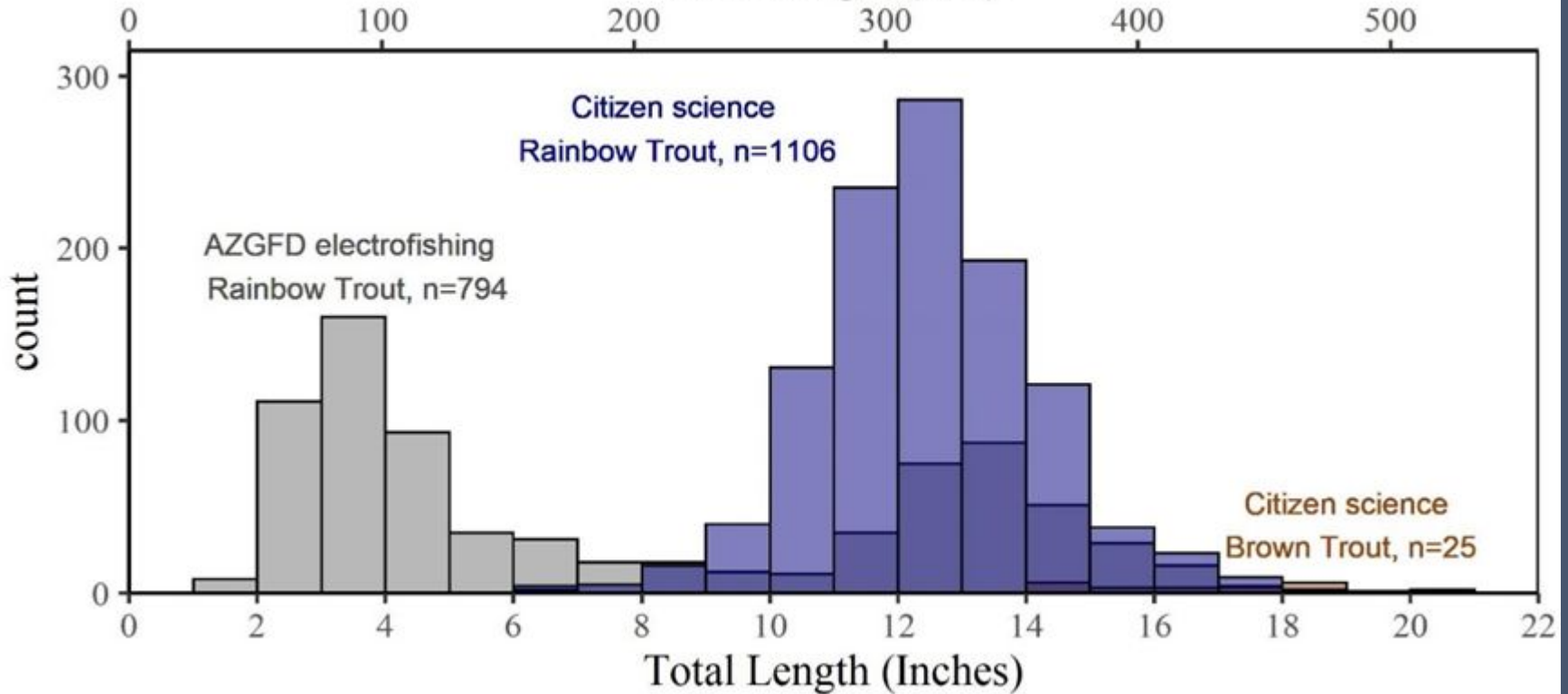


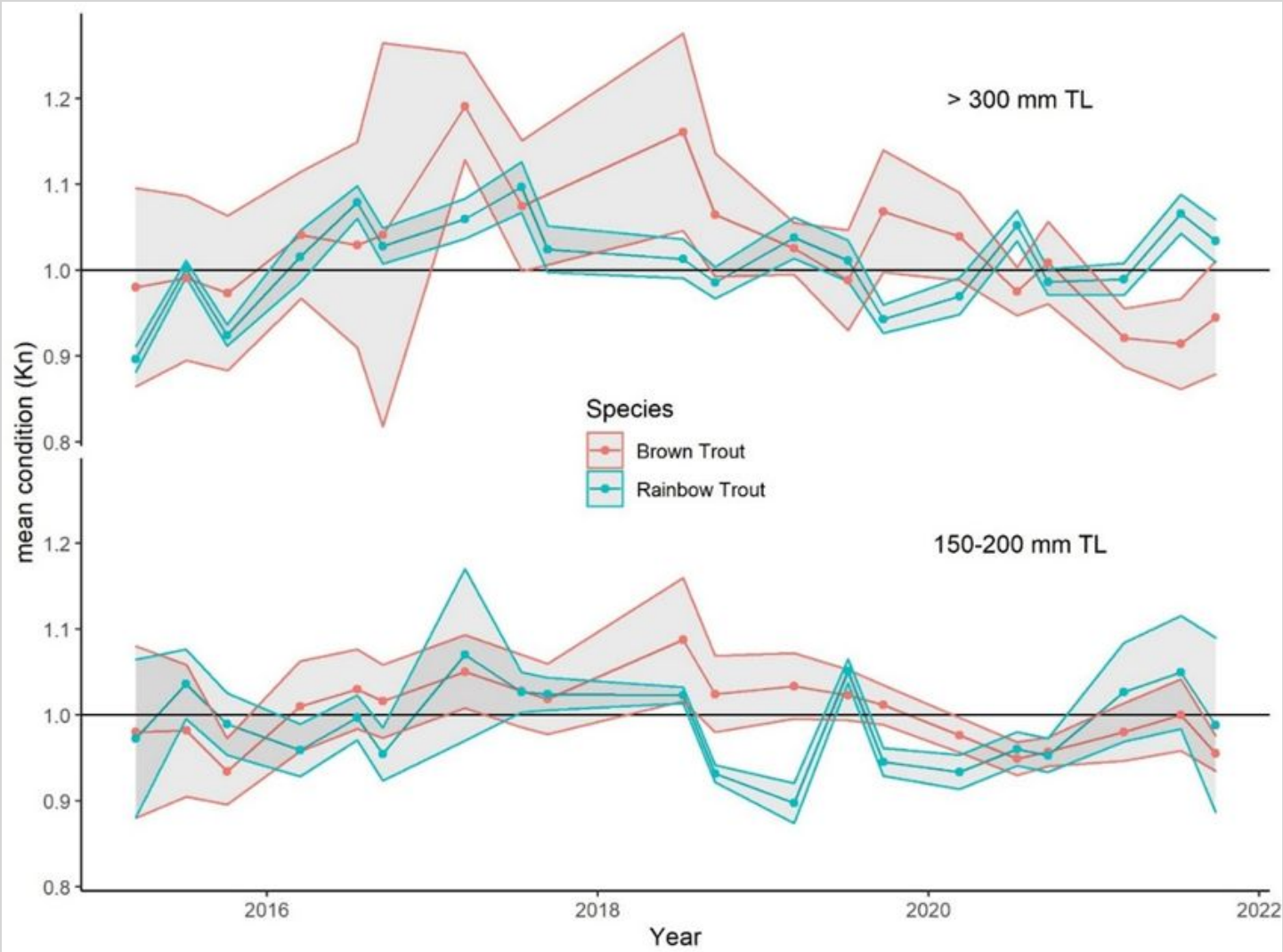
Creel Results 2022

- Boat
 - 595 anglers interviewed
 - RBT CPUE 0.74 fish/hr [0.67, 0.80]
- Walk-in
 - 94 anglers interviewed
 - RBT CPUE 0.52 [0.33 0.71]



Total Length (mm)







Rainbow Trout

Species Requirements

Coldwater Species

Water Temperature

Chronic tolerances

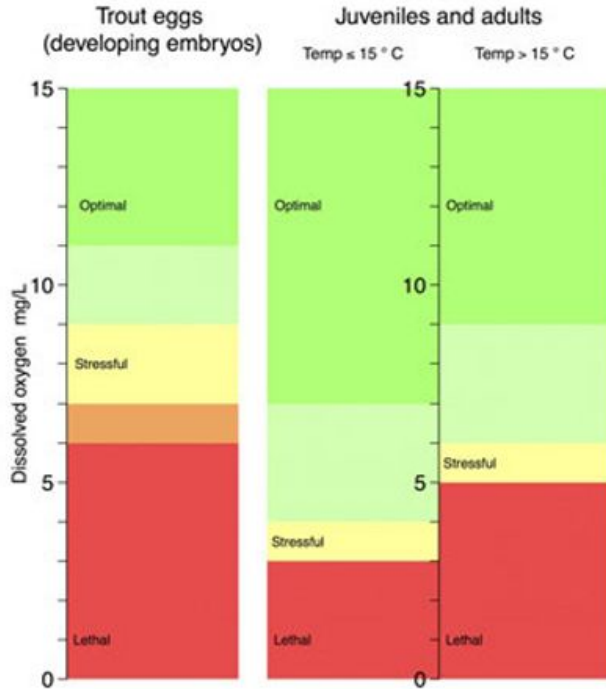
need < 20 degrees Celsius

Acute exposure

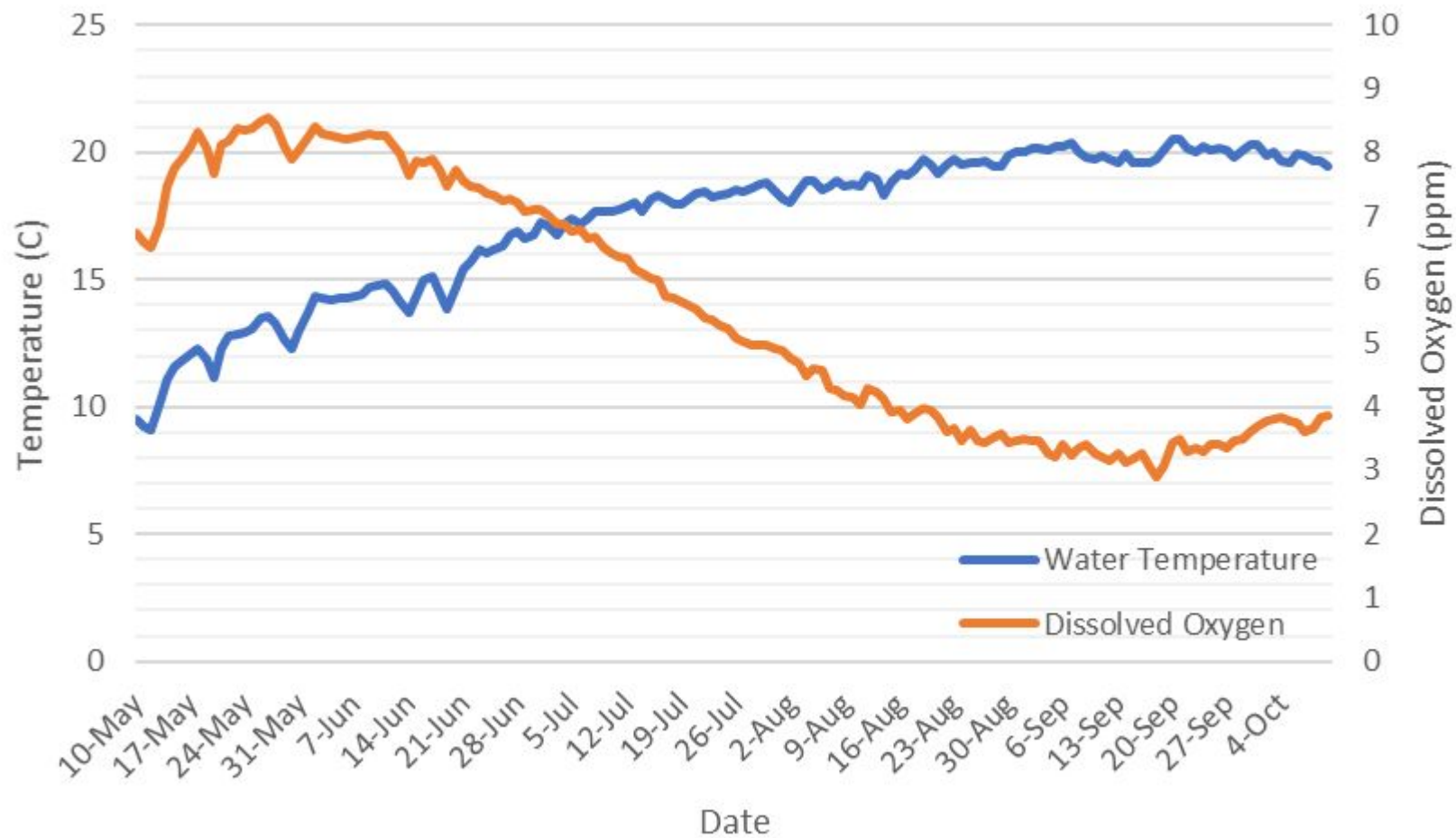
24-26 degrees Celsius

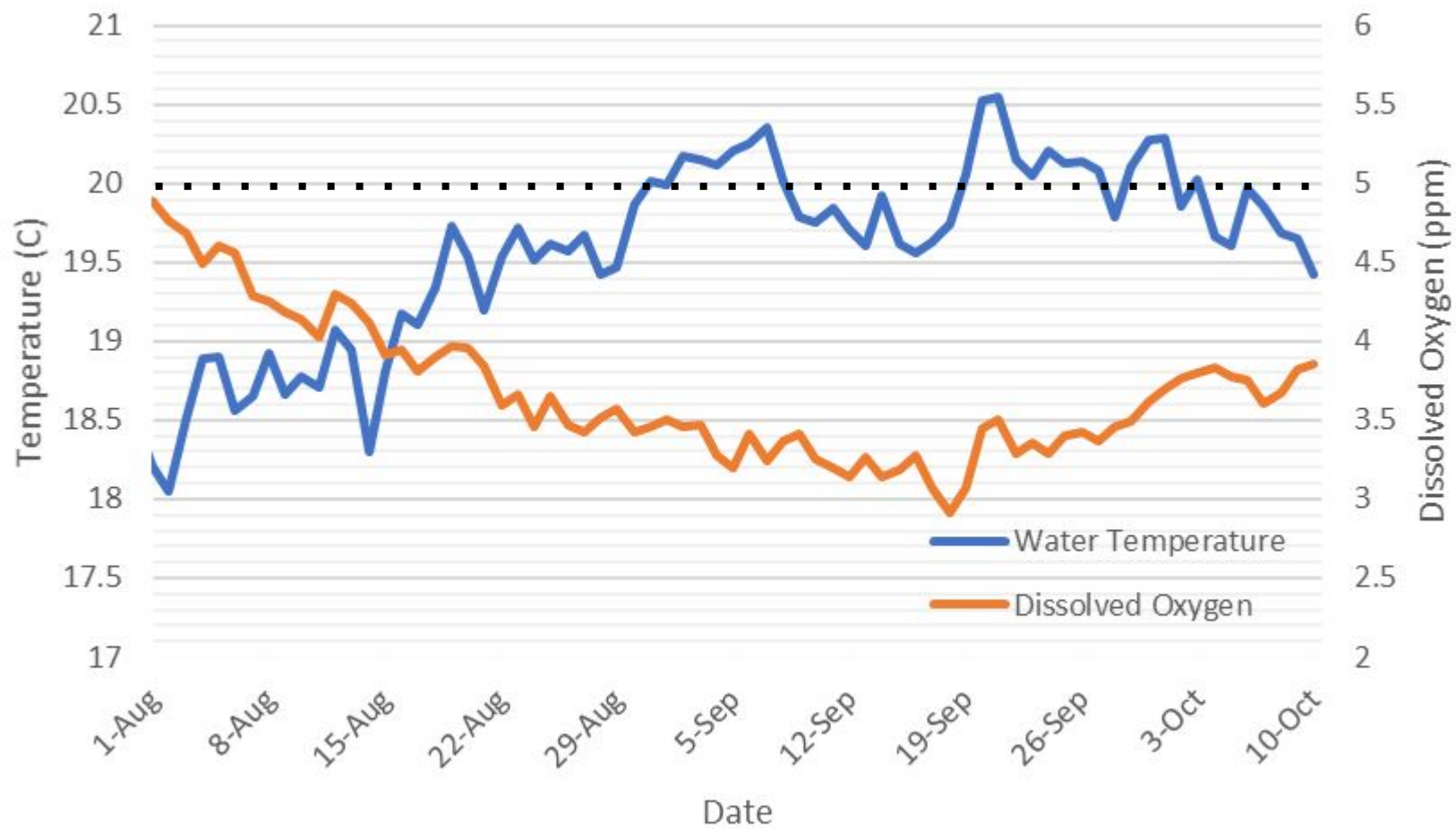
Dissolved Oxygen requirements
> 5 ppm

Average dissolved oxygen requirements for salmonids
Genera *Oncorhynchus* which includes Rainbow Trout and *Salmo* which includes Brown Trout

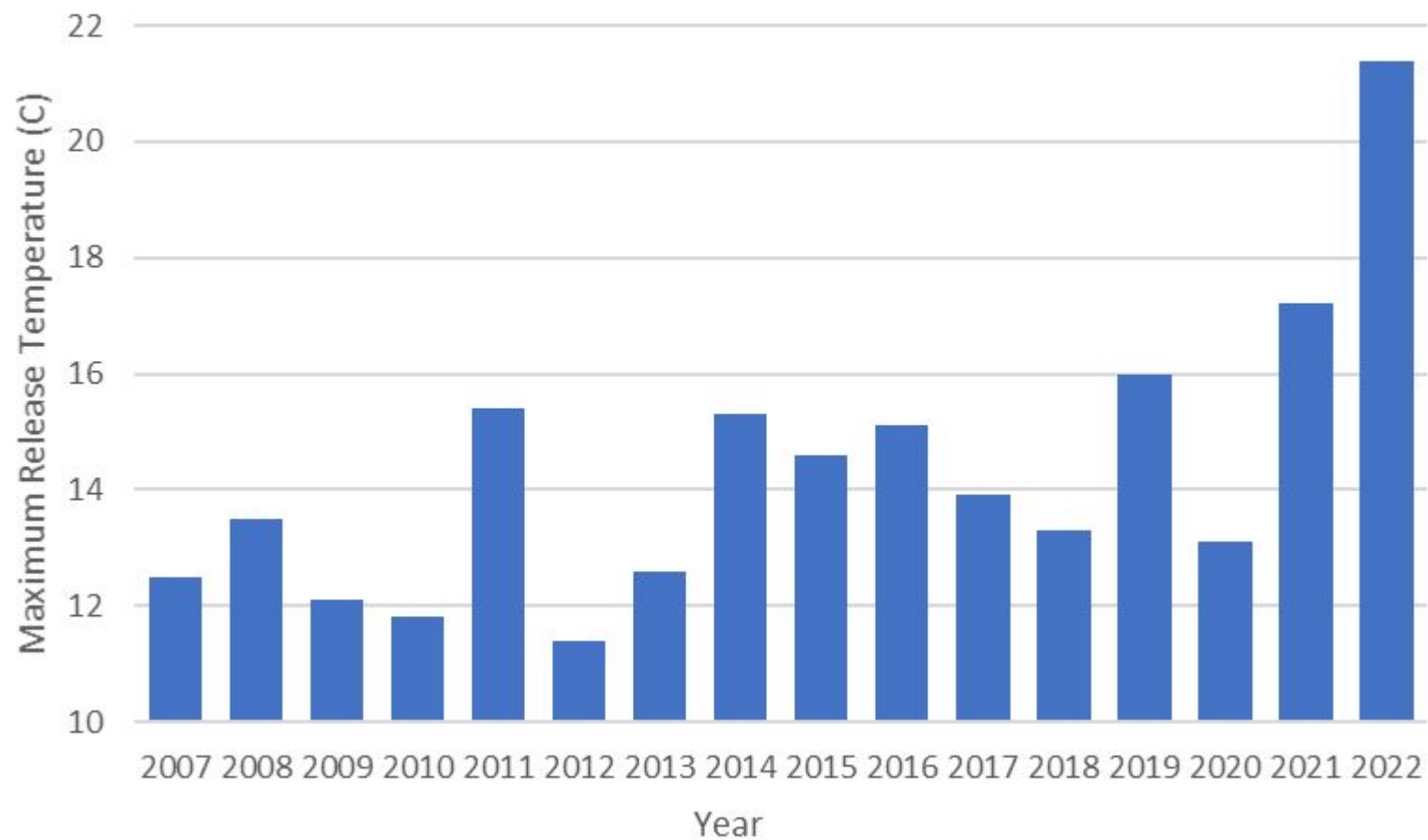


References: Chapman, G. 1986. Ambient water quality criteria for dissolved oxygen. U.S. E.P.A. EPA 440/5-86-003. 46 pp
Raleigh, R.F., T. Hickman, R.C. Solomon, and P. C. Nelson. 1984. Habitat suitability information: Rainbow trout. U.S. Fish Wildl. Serv. FWS/OBS-82/10.60. 64 pp
Raleigh, R.F., L. D. Zuckerman, and P. C. Nelson. 1986. Habitat suitability index models and instream flow suitability curves: Brown trout, revised. U.S. Fish Wildl. Serv. Biol. Rep. 82(10.124). 65 pp.

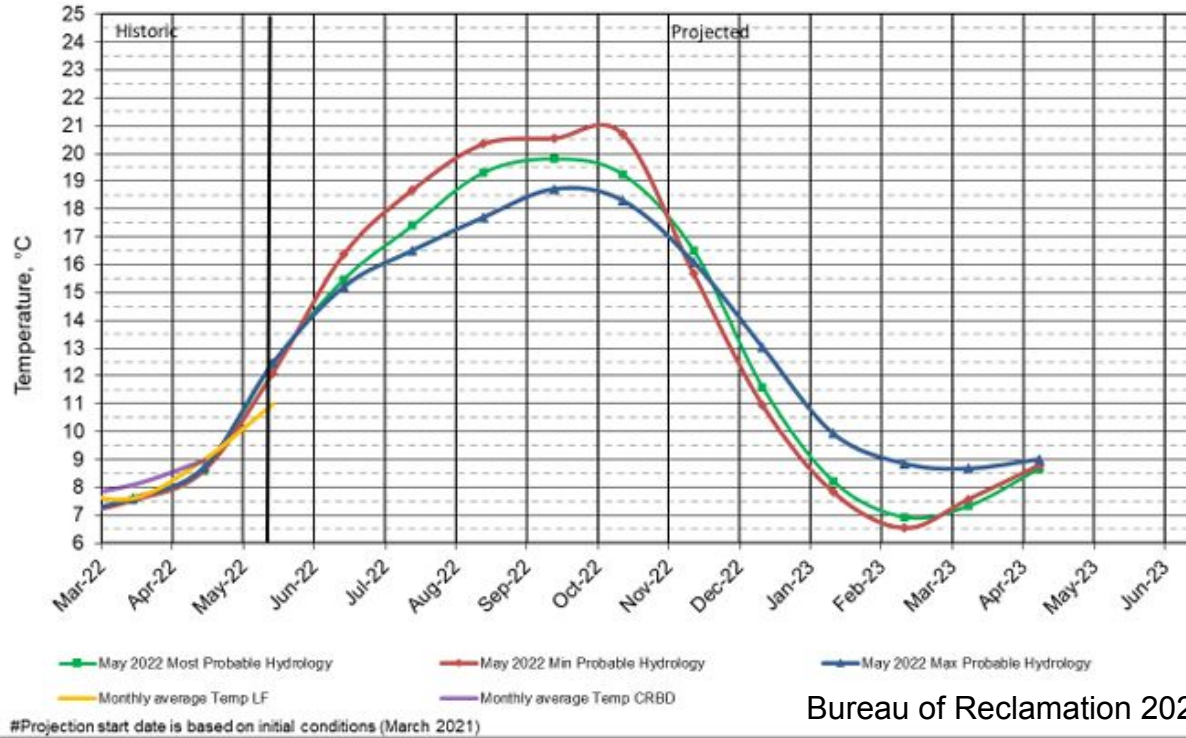




Maximum Release Temperature



Lake Powell Release Temperature Projected Temperature based on May 2022 Forecast



Bureau of Reclamation 2022

- Higher water temperatures for summer and fall of 2022+ are predicted to result in substantive weight loss for larger rainbow trout, leading to poor condition and a die-off by late 2023

Korman 2022

LTEMP Resource - Rainbow Trout Fishery

Goal: **Achieve a healthy high-quality recreational rainbow trout fishery in GCNRA** and reduce or eliminate downstream trout migration consistent with NPS fish management and ESA compliance.

- Economically important
 - Local businesses, guides,, recreational experience
 - \$13 million in direct expenditures, 2013 Economic Report
- Impact from warm water and low DO
 - Reports of fish mortality
- If mitigation measures existed, they would already be implemented.
- Expectations for further warming of system



Discussion Points

- Threat of catastrophic loss of fishery
- What management options exist?
 - Thresholds for implementation
 - Water Temperature
 - Dissolved Oxygen
- Warmwater non-natives represent a threat to RBT and native fish
 - Opportunity to simultaneously sustain Rainbow Trout fishery while disadvantaging high-risk warmwater non-natives and protect against establishment
- Water conditions in the Basin may limit effective management options

What Happens if Larger Rainbow Trout Die Due to Poor Growth and Condition?

- A large proportion of population will be lost
 - Owing to limited recruitment (new births) after 2017, current population is dominated by older/larger fish which are more sensitive to high water temperatures and low dissolved oxygen
- Recovery of fishery will be slow
 - Few young and small (less temperature-sensitive) fish are present to grow into larger size classes that support the fishery
 - Recovery of catch rates in fishery from 2014 collapse took ~ four years
- Higher brown trout abundance may impede recovery
 - Rainbow trout population recovered from collapses in 2006 and 2014, but brown trout abundance was much lower





THANK YOU