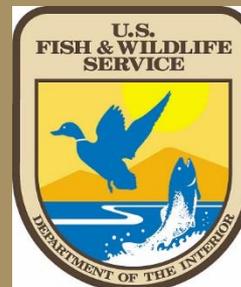


National Park Service  
U.S. Department of the Interior  
Grand Canyon National Park



# Brown Trout Management Considerations: An Update



# Brown Trout– A Review

- Brown trout stocked in Bright Angel Creek in the 1930's-expanded distribution post-dam.
- Brown trout recognized as a threat to native fish for more than 20 years:
  - Otis (1994) hypothesized the decline in native fish in Bright Angel as a result of increased dominance by brown trout since the 1970's and 1980's.
  - TWG Non-native Control Ad Hoc (2003):  
".....feasible methods to control non-native species should be implemented immediately because of the urgent need to protect humpback chub."

# History of Management Actions

- Bright Angel Creek weir feasibility study (2005)
  - Installation 2002 – 2003
- Little Colorado Inflow trout removal (2003-2009)
- NPS Bright Angel Creek Trout Reduction EA (2005)
- NPS Comprehensive Fisheries Management Plan (2013)
  - Includes “Comprehensive Brown Trout Control”
  - Intended to allow for control from Glen Canyon to Lake Mead, including tributaries

# History of Management Actions - Continued

- NPS Comprehensive Fisheries Management Plan (2013)
  - Removal of all brown trout captured during monitoring
  - Rapid response (mechanical removal only)
  - "Natal origins studies – target new source populations
- Arizona Game and Fish Department Lees Ferry Plan (2016)
  - Brown Trout are undesirable species in Lees Ferry
  - Removal of all brown trout captured during monitoring

# History of Management Actions - Continued

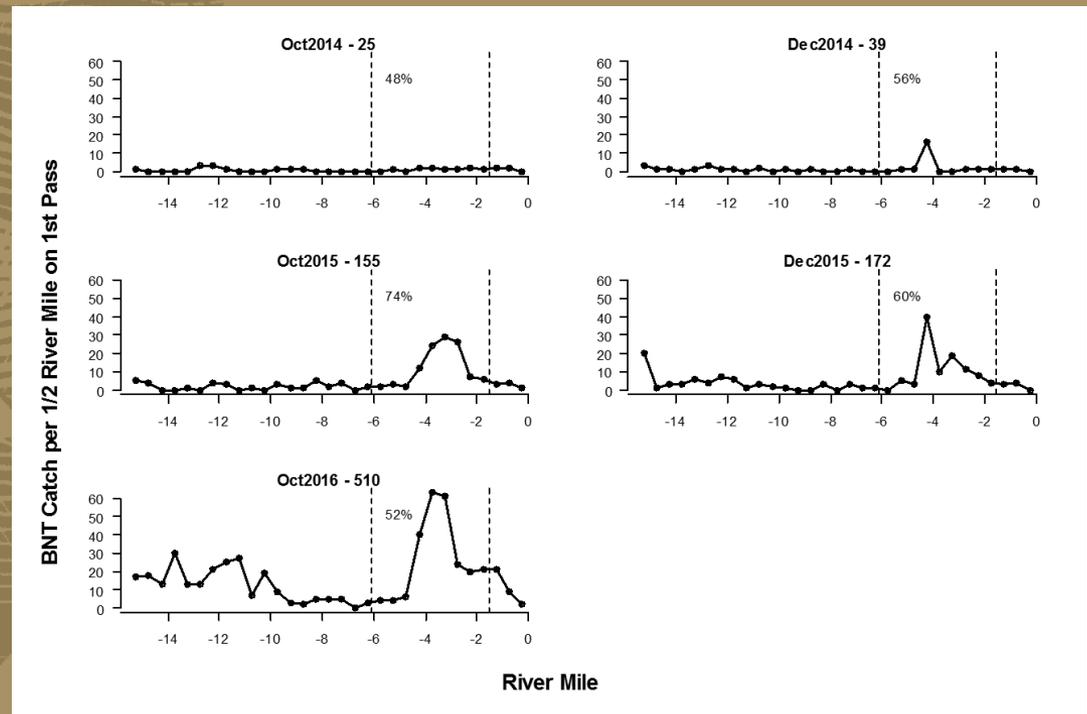
- LTEMP-Conservation Measures pertaining to brown trout – Biological Opinion, USFWS (2016):
  - Tributary nonnative fish control – consider rotenone
  - Bright Angel Brown Trout Control, and in other areas where new populations develop.
  - “Rapid Response” to newly establishing nonnative species
  - Consideration of experimental use of TMFs to inhibit brown trout spawning/recruitment in Glen Canyon

# Nonnative Control – Concerns

- Traditionally Associated Tribes: Taking of Life
  - Throughout Grand Canyon
  - Little Colorado River Confluence
  - “Beneficial Use”
- Anglers:
  - Bright Angel Creek (managed for native fish)
  - Lees Ferry fishery (managed for Rainbow Trout)
- Costs
- Sustainability of Control Efforts
- Effectiveness?
- No Action –brown trout will expand/increase

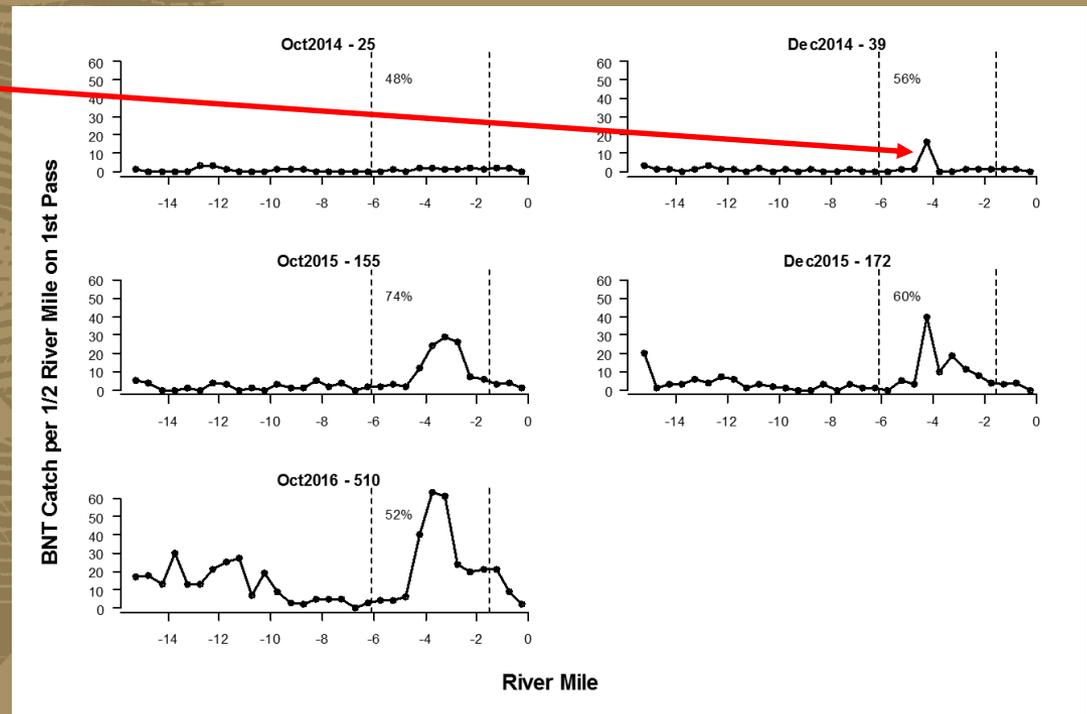
# Brown Trout – Review of Latest Trends

- Natal Origins (Yard/Korman):
  - Expanded distribution and abundance in Glen Canyon
  - Data indicate 50% or more of brown trout catch can be found concentrated around 4-mile bar
  - Capture probability may vary seasonally



# Brown Trout – Review of Latest Trends

- Natal Origins (Yard/Korman):
  - Expanded distribution and abundance in Glen Canyon
  - Data indicate 50% or more of brown trout catch can be found concentrated around 4-mile bar
  - Capture probability may vary seasonally
- Missed Opportunity?
- Area to target removals?



# What's next?

- ▶ Thus far:
  - ▶ NPS- Glen Canyon NRA hosted a meeting on October 27
  - ▶ Fisheries cooperators meetings/ Brown Trout Workgroup
- ▶ BNT Workgroup: Potential actions to target multiple life stages:
  - ▶ Short-term:
    - ▶ Mechanical suppression – either targeted at spawning areas or throughout Glen Canyon
    - ▶ Research – sonic/radio telemetry
  - ▶ Long-term:
    - Adapt experimental Trout Management Flows to target brown trout
    - ▶ Research and Development: “Daughterless Fish Technology”

# What's next?

- ▶ Uncertainties:
  - ▶ What is the cause of the brown trout increase?
  - ▶ How effective are various options?
    - ▶ TMFs, are untested, and designed to manage rainbow trout fishery by suppressing recruitment
    - ▶ Other methods; gill nets, redd disturbance?
  - ▶ How vulnerable are brown trout to electrofishing?
    - ▶ Suppression only, and mixed results
  - ▶ Impacts to non-target rainbow trout?
- ▶ Outreach and Consultation



# Sonic Telemetry- Brown Trout

Goal: Assess uncertainty in vulnerability to electrofishing

Objectives:

1. Determine diurnal/nocturnal habitat use in adult brown trout
2. Use tagged fish to find locations of spawning aggregations to target for future mechanical removal.

Methods – Pilot Study

- Tag n= 10 adults with radio/sonic tags
  - February 1-3
  - Manual tracking
- Deploy 5 SURs
- BIO-WEST, inc.
- USGS-GCMRC

