

# Native Trout in Northeastern Arizona – Possibility of Another Native Salmonid

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# Introduction

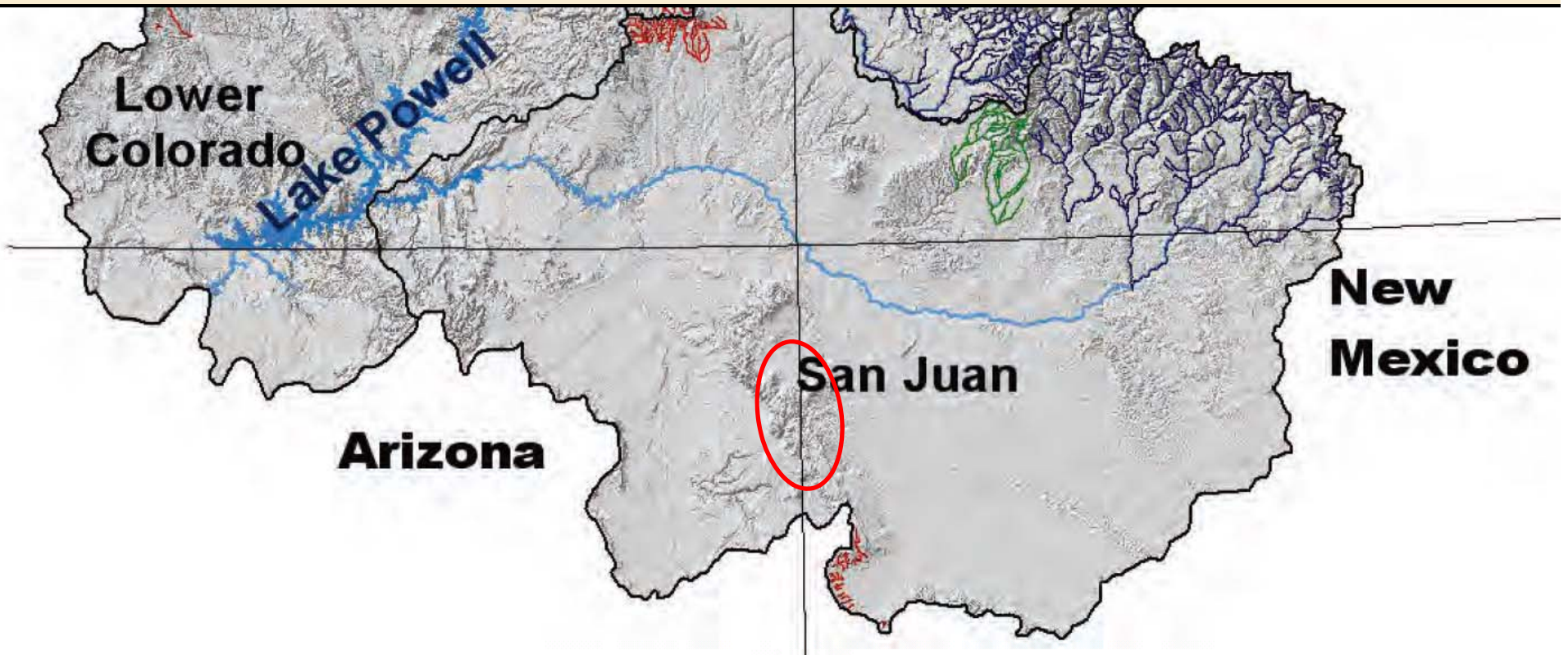
- Colorado River cutthroat (CRCT)
  - Approximately 500 populations throughout CO, UT, and WY
  - Reduced to <5% of historic range
- Why the importance?
  - Although not likely, CRCT petitioned in 2000 to be listed under the ESA
  - 2/14 subspecies of cutthroat have gone extinct

- The idea of CRCT in AZ and NM...
  - Commonly accepted by fisheries managers/researchers; discussed and/or identified in the following:
    - Behnke 1979
    - Behnke 1992
    - Hirsch et al. 2006
    - Young 2008
    - Minckley and Marsh
    - Haak et al. 2010



*Tsaile Creek, Chuska Mountains, AZ*

# Distribution



*Haak et al. 2010*

- Hirsch et al. (2006), Young 2008, and Haak et al. 2010 identify/discuss watersheds not mentioned by Behnke (1979, 1992)

- Obviously some confusion regarding historical distributions of CRCT in AZ and NM
- Three recent publications assume that CRCT no longer occurs in AZ or NM
- But more importantly, what evidence exists or did exist for CRCT in the Chuska Mountains?

# Methods

- Objective: Determine the historic and/or current presence of CRCT in the Chuska Mountains of AZ/NM
- Will be accomplished by:
  - 1) Review of historic literature and interview of past researchers
  - 2) Review of museum specimens
  - 3) Review of hatchery stocking records
  - 4) Genetic analyses of trout containing cutthroat characters

# Results

- Results ongoing
  - Anticipated Results:
    - Define extent of CRCT occurrence in Chuska mountain streams
      - Genetic analysis
    - Define extent of historical occurrence in San Juan Basin
      - Lit review, correspondence, museum specimens, etc.
    - Comprehensive Report/Manuscript

## 1) Review of historic literature and interview of researchers

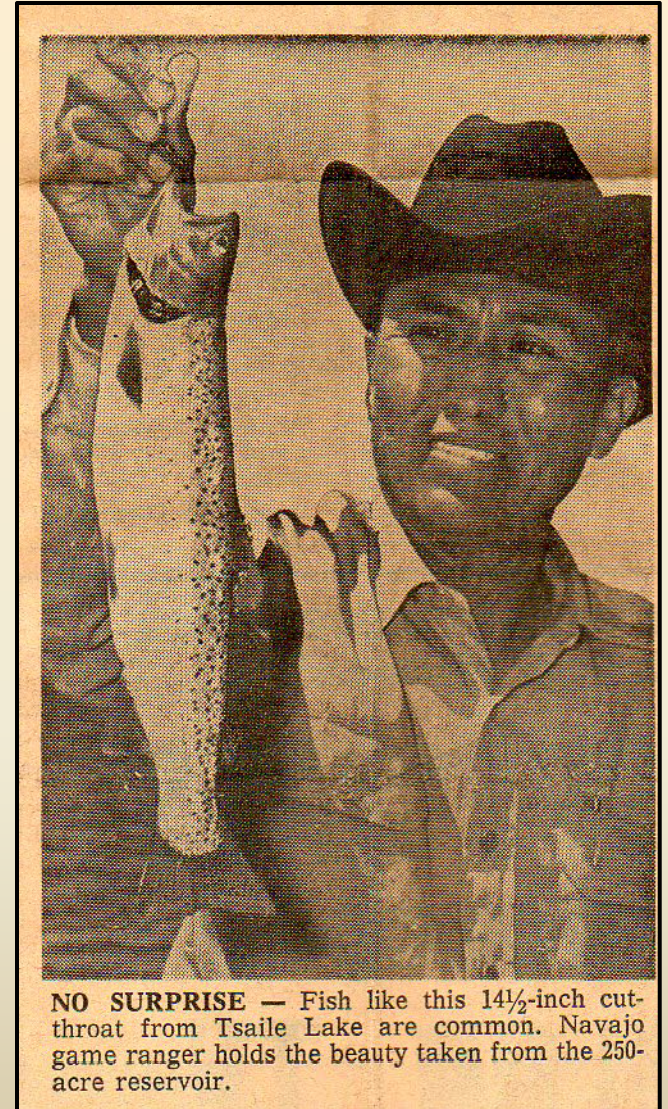
- Cope and Yarrow 1875: no information
- Behnke's notes, Trout and Salmonid Collection, Montana State University: no information regarding possible CRCT mentioned in Behnke 1979 or Chuska Mountains
- 3 retired USFWS employees and Robert Behnke

## 2) Review of museum specimens

- Contacted about 12 museums throughout US and region
- No information regarding possible CRCT mentioned in Behnke 1979; could be located at Monte L. Bean Life Sciences Museum
- CRCT specimens found at:
  - University of Colorado Museum of Natural History: 19 specimens collected from South Fork of Wheatfield Creek in 1967 by Behnke's grad students
  - University of New Mexico Museum of Southwestern Biology: 6 specimens collected from South Fork of Wheatfield Creek in 1975 by C. Sanchez

### 3) Review of hatchery stocking records

- Searched stocking records ( $\geq 1960$ s) at Alchesay NFH
  - Stockings of rainbow and brook trout in Tsaile Creek during the late 1960s
  - No records of CRCT stockings in creeks
  - Newspaper article describes Yellowstone cutthroat stockings in 1963 in Tsaile Lake; could have been Rio Grande cut hybrids



*Courtesy of G. McFaul*

## 4) Genetic analyses of trout containing cutthroat characters

- 1 sampling trip in October 2010
  - Majority of Tsaile Creek Watershed sampled
  - 90 rainbows captured
  - 5 cutthroat hybrids captured
  - No genetic analyses completed



*Young 2008*



*Possible cutthroat hybrid; notice large spots oriented to caudal region and yellowish coloration.*

# Discussion

- Literature and museum specimens suggest that CRCT occurred in the Chuska Mountains
- Previous and current surveys show that Tsaile and Wheatfield Creek watersheds contains rainbow-cutthroat hybrids but species unknown
- Large scale distribution of cutthroat in the West and lack of natural barriers that would not have prevented colonization of the Chuska Mountains

- As discussed, introductions of Yellowstone/Snake River cutts could have occurred. However, Metcalf et al. 2007 discusses repeated transfers of CRCT throughout Colorado beginning in the late 1800s
- Even if we find no evidence... does this mean CRCT didn't occur in the Chuska Mountains?

# Future Efforts

- Review additional hatchery stocking records from Williams Creek NFH and hatcheries from southern Colorado
- Additional field work in Tsaile, Wheatfield, and Whiskey watersheds
  - Goal of  $\geq 20$  samples/watershed (>60 samples total)

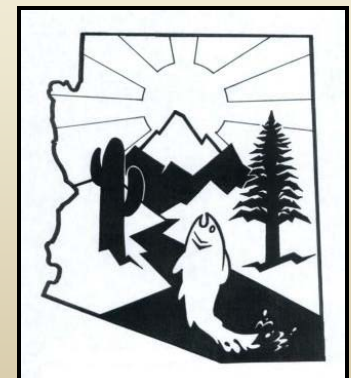
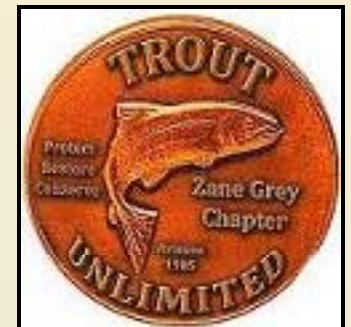
- Review of most appropriate genetic technique
  - AFLP vs microsatellite
- Additional literature reviews
  - Military journals from Fort Defiance (if available)



*Tsaile Creek tributary*

# Acknowledgments

- Jeff Cole, Navajo Nation Department of Fish and Wildlife
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- Glenn McFaul, interested fly fisherman
- Stewart Jacks and Jeremy Voeltz, USFWS Arizona Fish and Wildlife Conservation Office



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