

The History of Freshwater Mussels in the Buffalo National River

Shawn Hodges
Buffalo National River



Why are they Important?

- Food
- Indicators of water quality
- Mussel filter water for their food
- This includes sediment, bacteria, etc.
- An adult mussel can filter up to 15 gal/day

Math Time

- USGS uses cubic feet per second (cfs)

Math Time

- USGS uses cubic feet per second (cfs)
- 1 cubic foot of water = ~7.5 gallons

Math Time

- USGS uses cubic feet per second (cfs)
- 1 cubic foot of water = ~7.5 gallons
- Buffalo River – Harriet = ~3000 cfs

Math Time

- USGS uses cubic feet per second (cfs)
- 1 cubic foot of water = ~7.5 gallons
- Buffalo River – Harriet = ~3000 cfs
- Buffalo River – Harriet = 1.9 billion gal/day

Math Time

- USGS uses cubic feet per second (cfs)
- 1 cubic foot of water = ~7.5 gallons
- Buffalo River – Harriet = ~3000 cfs
- Buffalo River – Harriet = 1.9 billion gal/day
- 1 billion seconds = ~32 years

Math Time

- USGS uses cubic feet per second (cfs)
- 1 cubic foot of water = ~7.5 gallons
- Buffalo River – Harriet = ~3000 cfs
- Buffalo River – Harriet = 1.9 billion gal/day
- 1 billion seconds = ~32 years
- Take ~130 million adult mussels



Background

- Mussel Surveys –
 - Meek and Clark 1910 – 22 species
 - Gordon et al. 1980 – 27 species
 - John Harris 1995 – 27 species
 - Mickey Matthews 2006 – 25 species
- Partial (focused) Surveys
 - USFWS listings
 - Special projects

Background

- Total number of expected species = 27
 - 2 species never collected
 - Pondmussel
 - Pimpleback
- Total number confirmed species = 25

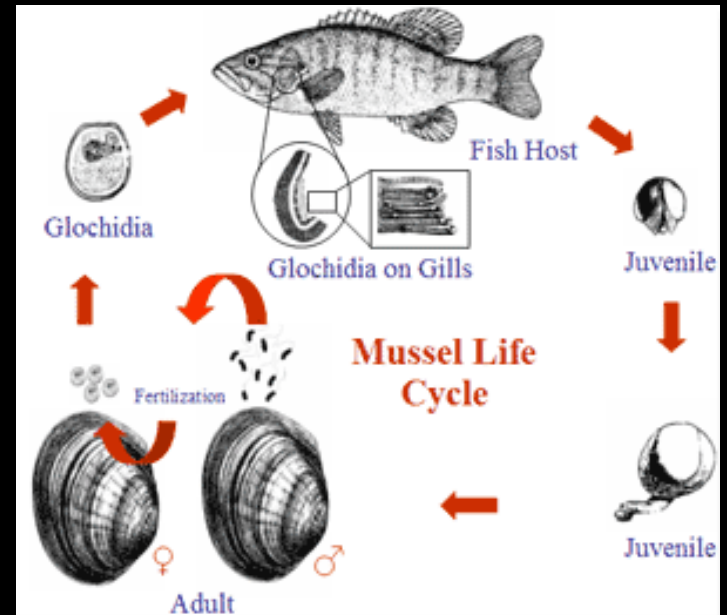
Background

- Total number of confirmed species = 25
 - Plus two species added in 2006
 - Snuffbox
 - Paper pondshell
 - Minus two species considered extirpated
 - Black sandshell
 - Bleufer
- Current number of species found = 25
 - Two are listed
 - Snuffbox (Endangered)
 - Rabbitsfoot (Threatened)

Mussel Life History



© M. C. Barnhart 2005





© M. C. Barnhart 2004



© M. C. Barnhart



Definitions

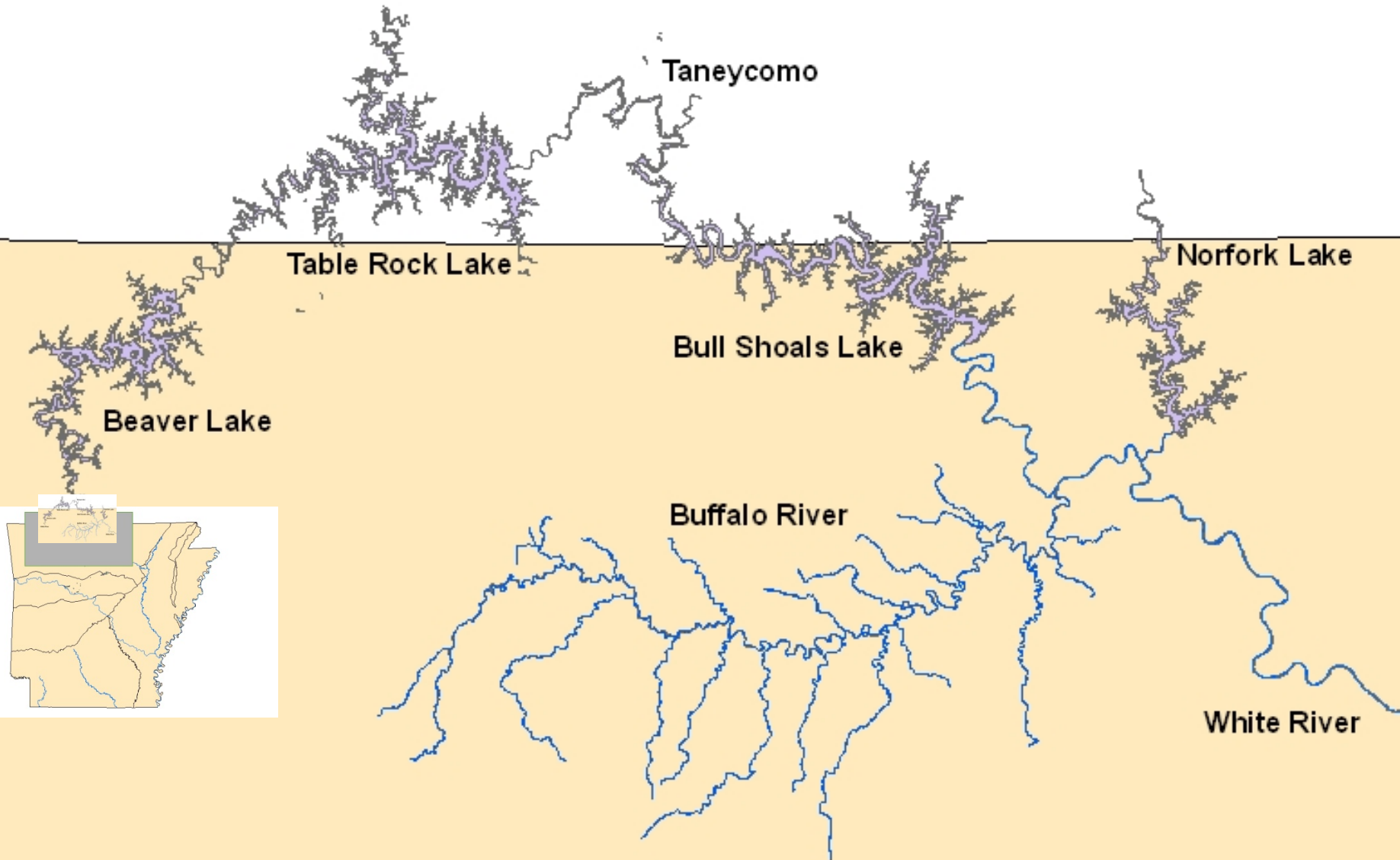
- Extinct – lost forever
- Extirpated – no longer found in certain areas but still in existence
- Functionally extirpated – Still present but remnant population no longer able to meet ecosystem requirements

White River Lock-and-Dam #1 at Batesville, Arkansas

(142-km below Buffalo River confluence)



Hydrology – Host Fish

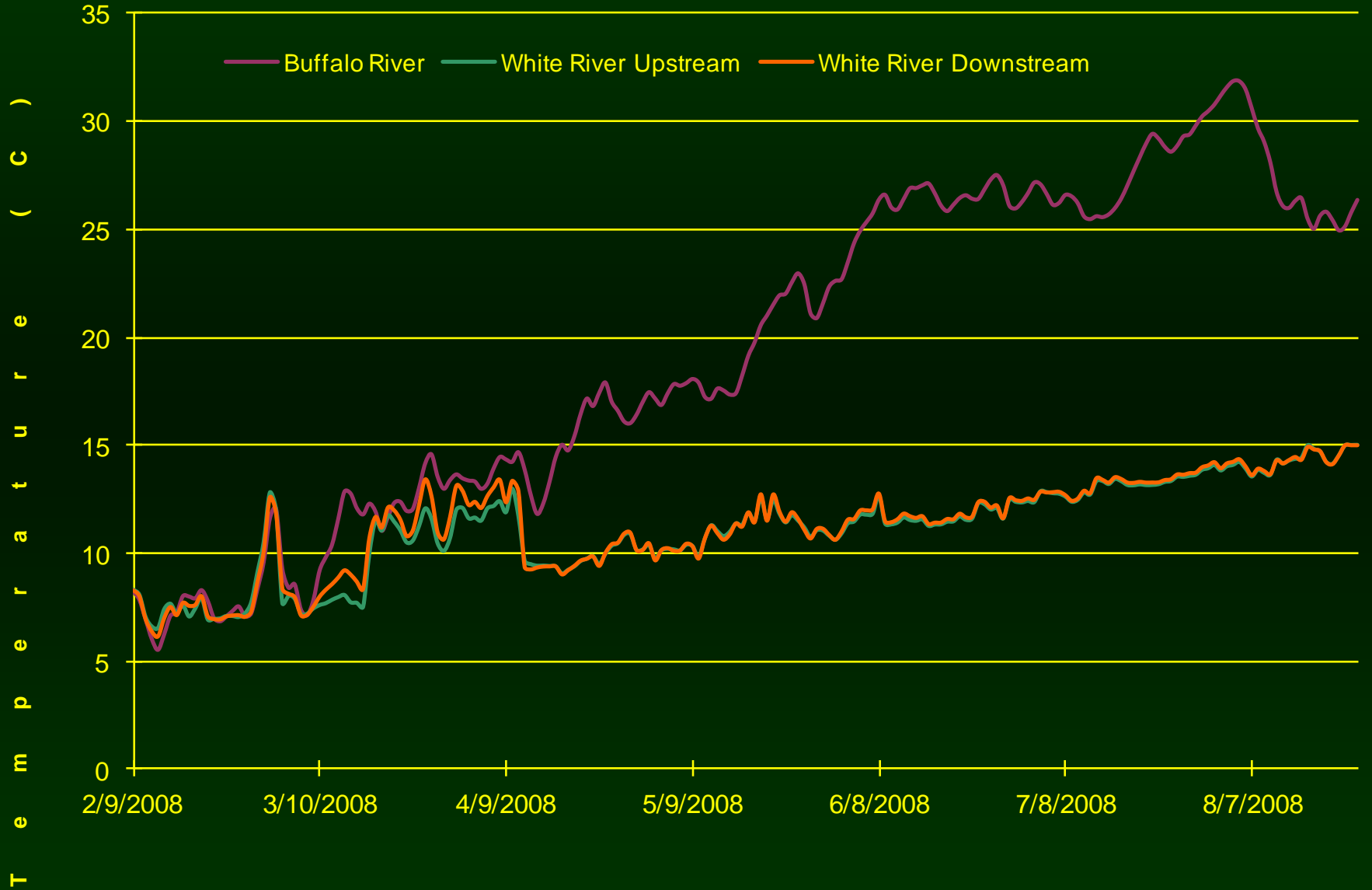








Daily Means for Confluence



What do we know

- Minus two species considered extirpated
 - Black sandshell (walleye)
 - Bleufer (freshwater drum)
 - White River has >50 species of mussels
 - Other expected species





What do we know

- Minus two species considered extirpated
 - Black sandshell (walleye)
 - Bleufer (freshwater drum)
 - White River has >50 species of mussels
 - Other expected species
- Two species on endangered species list
 - Snuffbox are declining range wide
 - Rabbitsfoot ???

Projects

- USGS mussel project – starting 2019
 - Survey of river – population trends
 - Nitrogen levels on recruitment
- T & E projects - needed
- Complete second round of geomorphology at long-term monitoring sites - needed



Questions?