

# The Tennessee River's Aquatic Biodiversity

Bernie Kuhajda



TENNESSEE  
AQUARIUM

CONSERVATION INSTITUTE

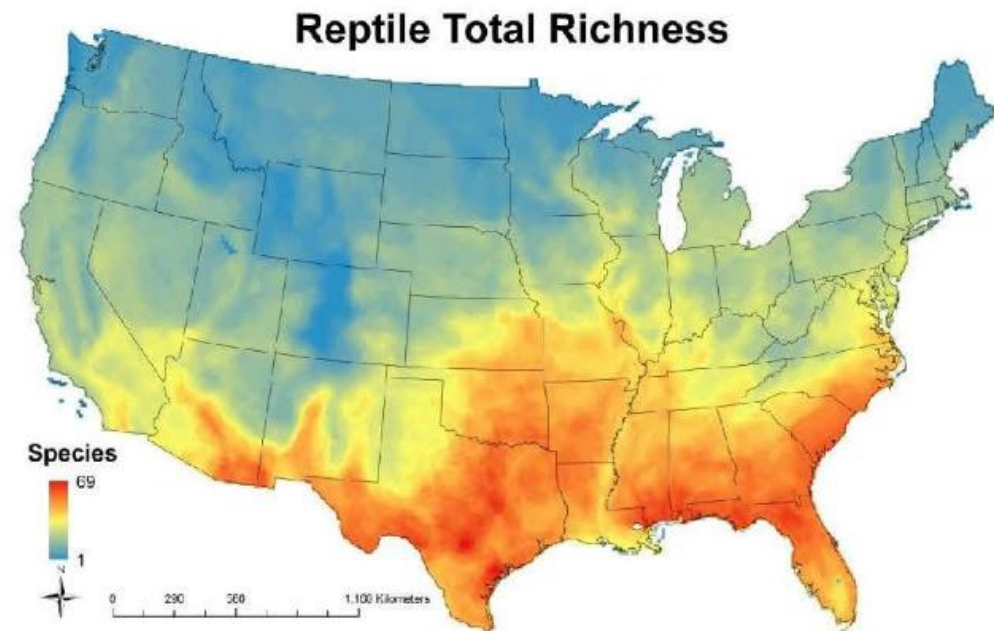
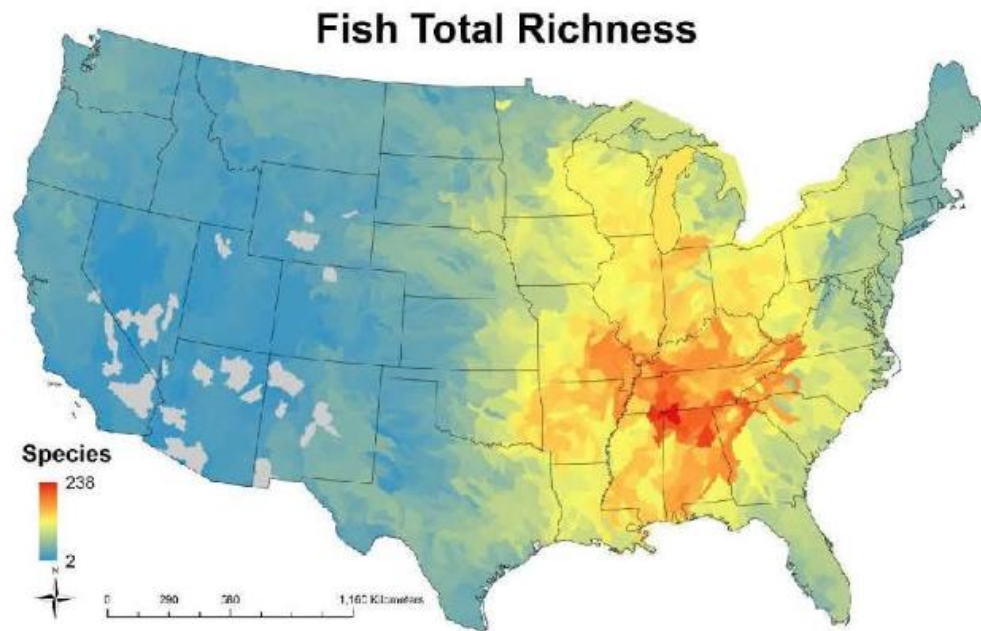
# Fresh Water Is Life!

- We depend on 0.01% of Earth's water for our existence
- Roughly 25% of all vertebrate species are found in these same freshwater habitats



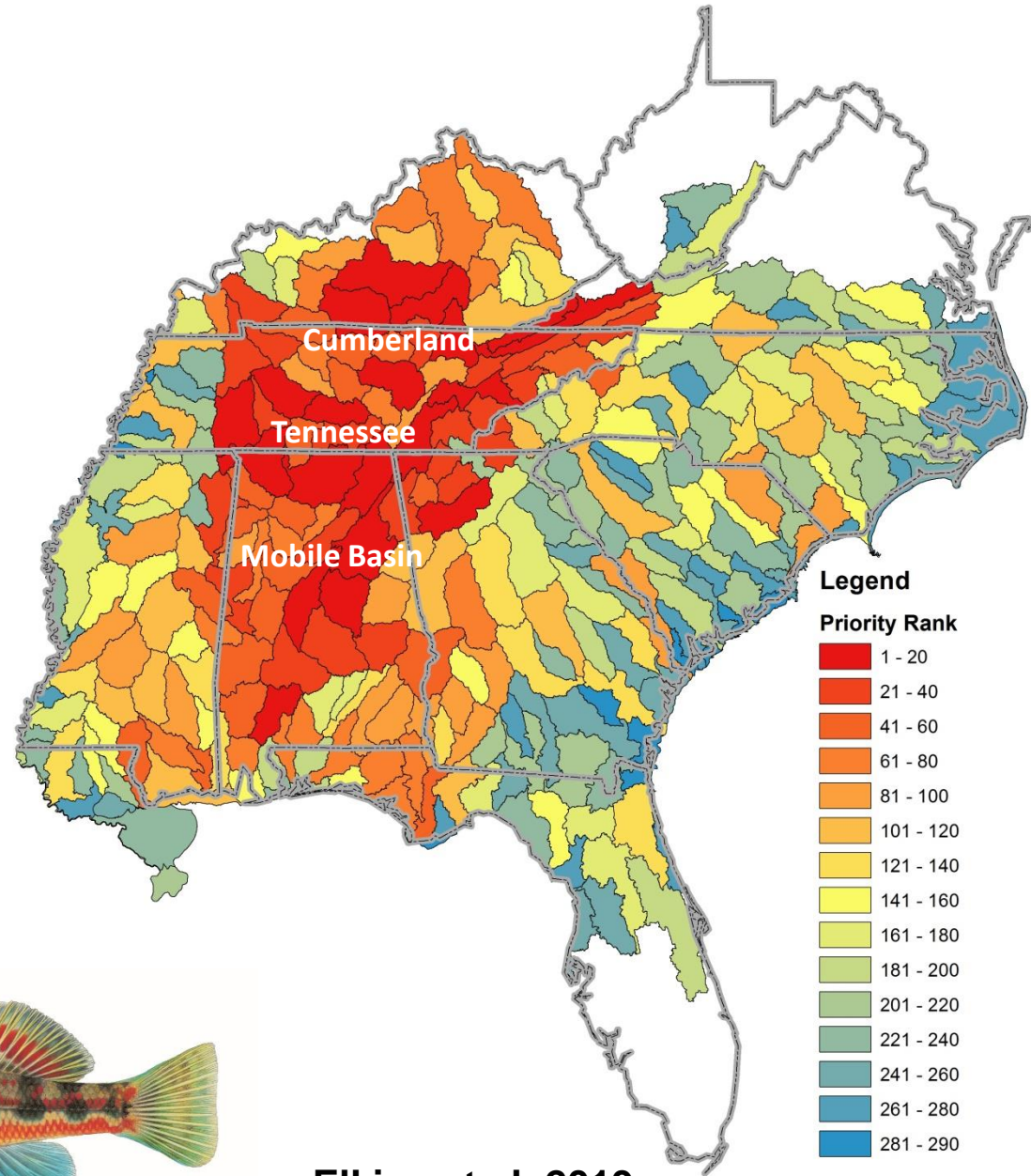
# Southeastern Biodiversity

Rich diversity of freshwater fishes, mussels, snails, crayfishes, turtles, salamanders, & others



# HUC 8 Priority Watersheds

1. Wheeler Lake
2. Pickwick Lake
3. Upper Clinch River
4. Lower Duck River
5. Cahaba River
6. Caney Fork
7. Lake Cumberland
8. Middle Coosa River
9. Etowah River
10. South Fork Cumberland



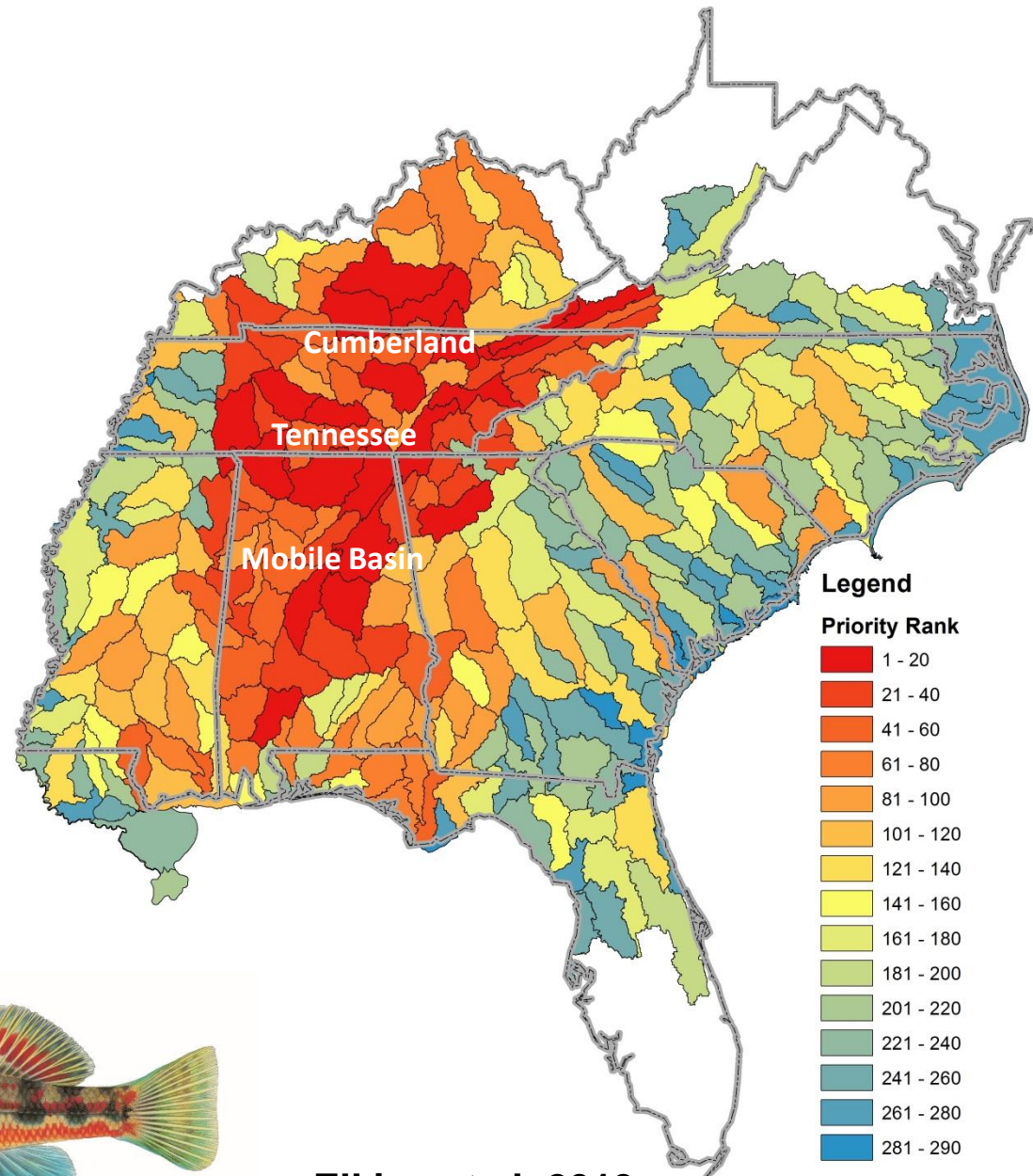
Elkins et al. 2019



Over 400 fish species  
Cumberland, Tennessee,  
and Mobile Basin

48% of fish diversity in U.S  
& Canada

1.4% of area

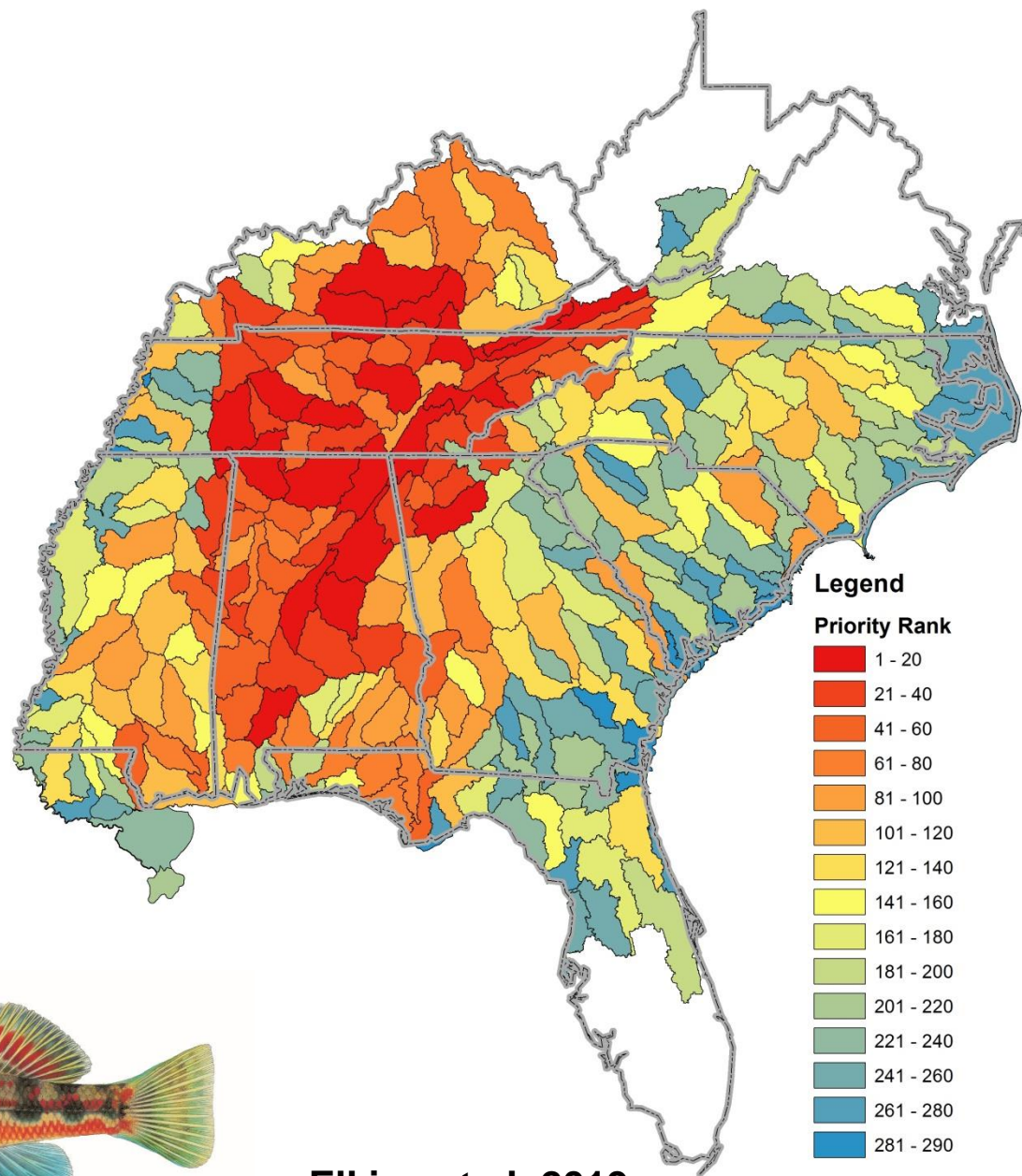


Elkins et al. 2019



# HUC 8 Priority Watersheds

1. **Wheeler Lake**
2. **Pickwick Lake**
3. **Upper Clinch River**
4. **Lower Duck River**
5. Cahaba River
6. Caney Fork
7. Lake Cumberland
8. Middle Coosa River
9. Etowah River
10. South Fork Cumberland



Elkins et al. 2019



**263 species of fishes  
Tennessee River**









B. Peoples

# 58 species of fishes only in Tennessee River



**16 species of fishes listed  
Tennessee River**





**125 species of mussels**  
**Tennessee River**

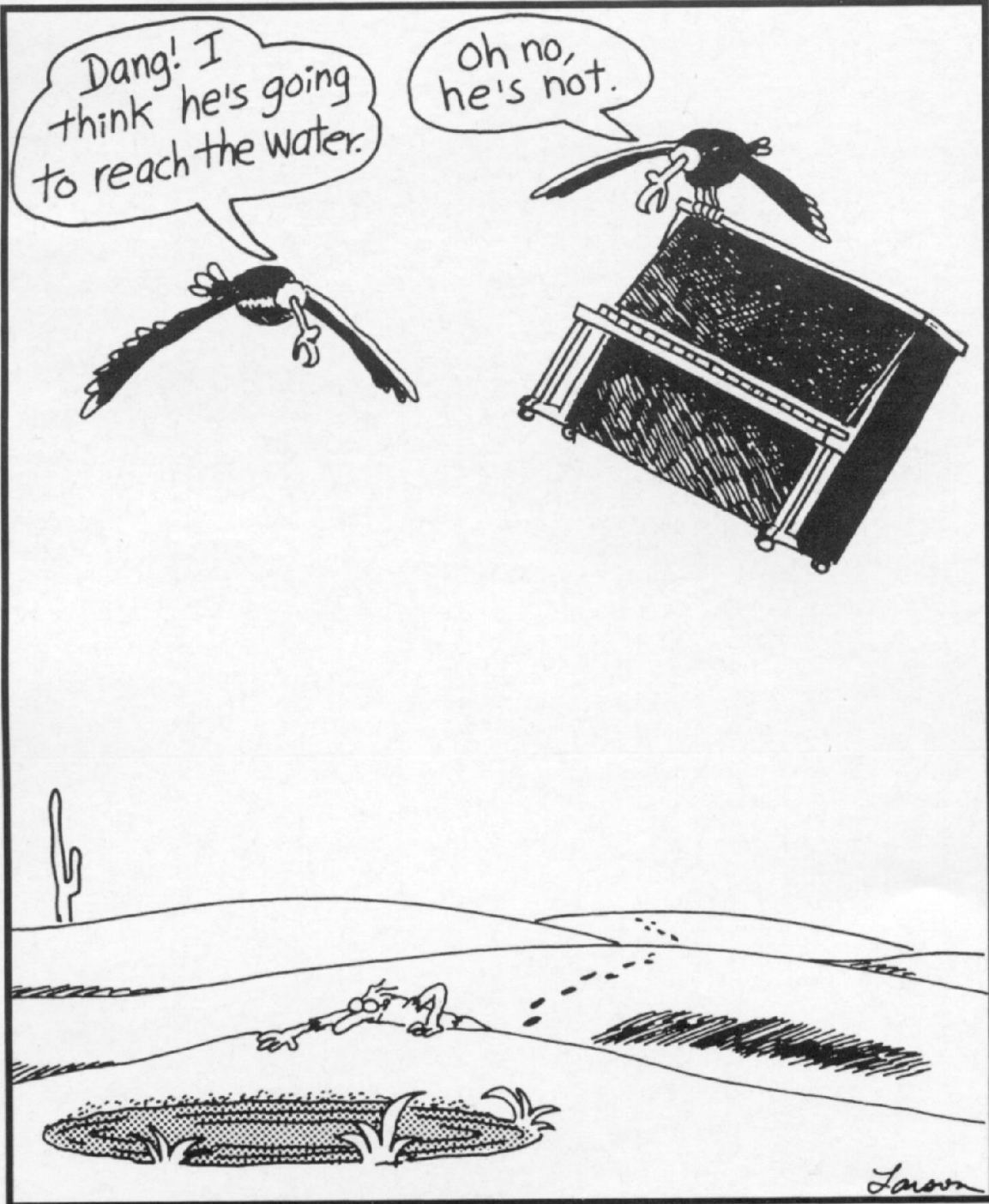


# 75 species of crayfishes Tennessee River



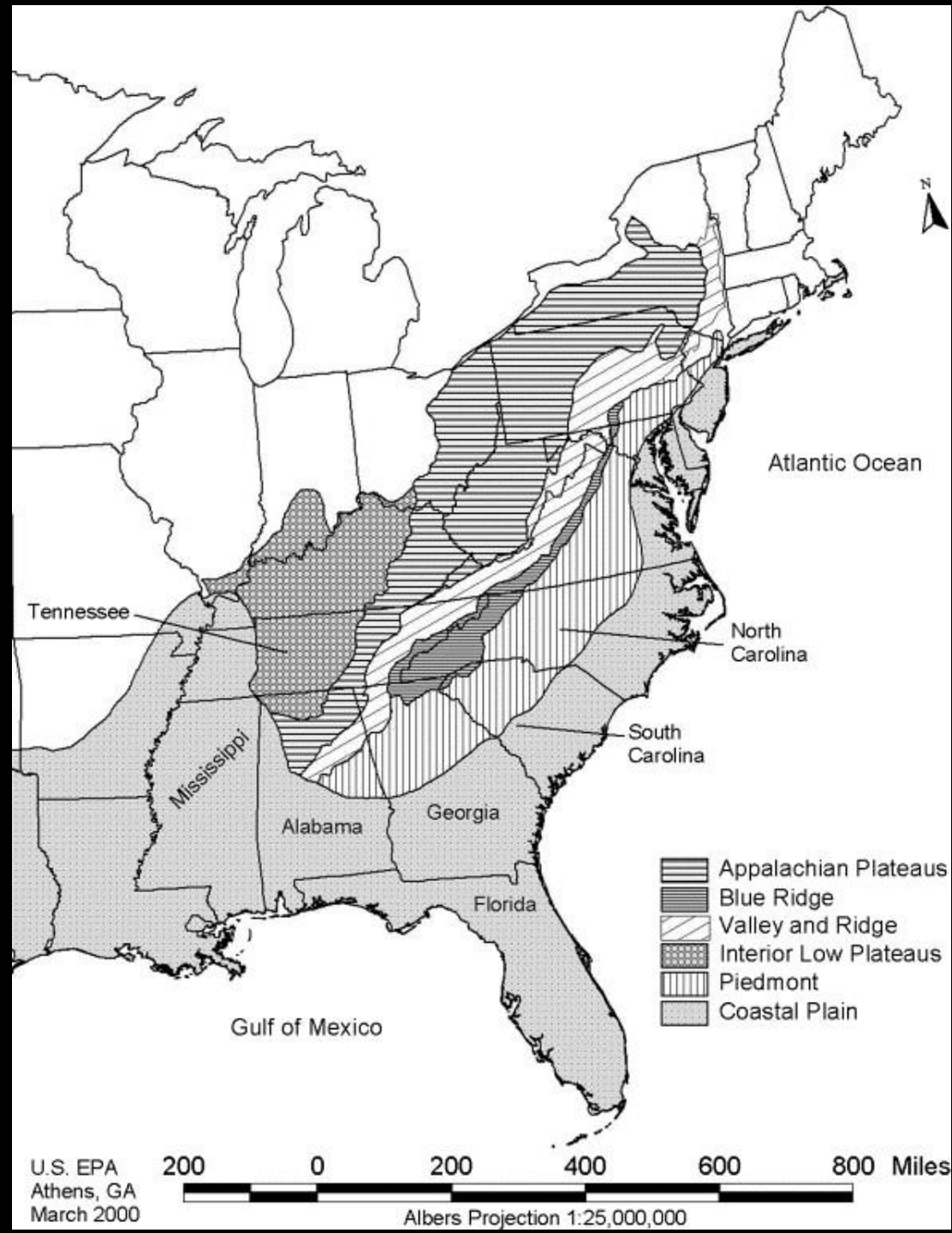
Dang! I think he's going to reach the water.

Oh no, he's not.



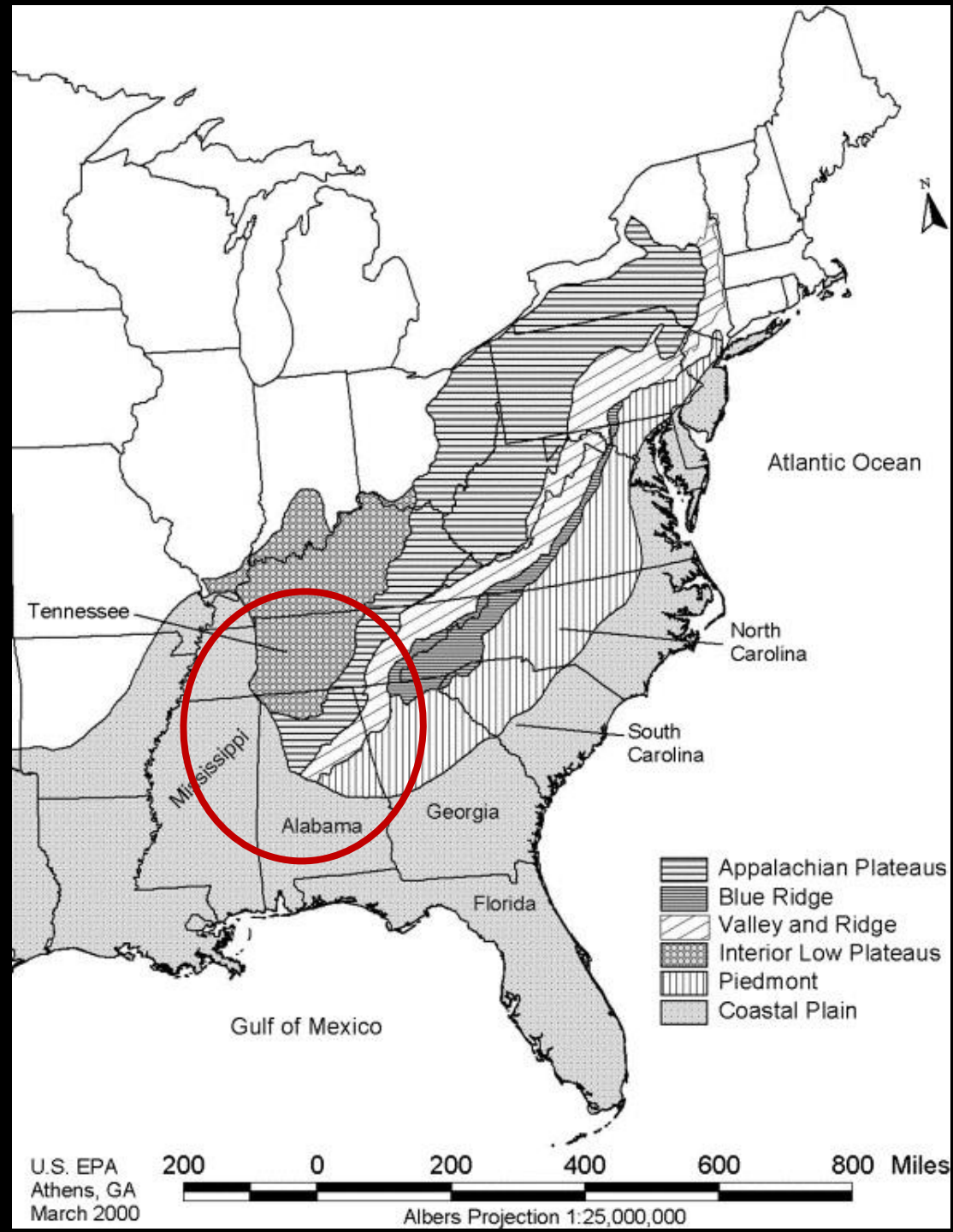
Larson

# Physiographic Provinces of Southeastern U.S.





# Physiographic Provinces of Southeastern U.S.

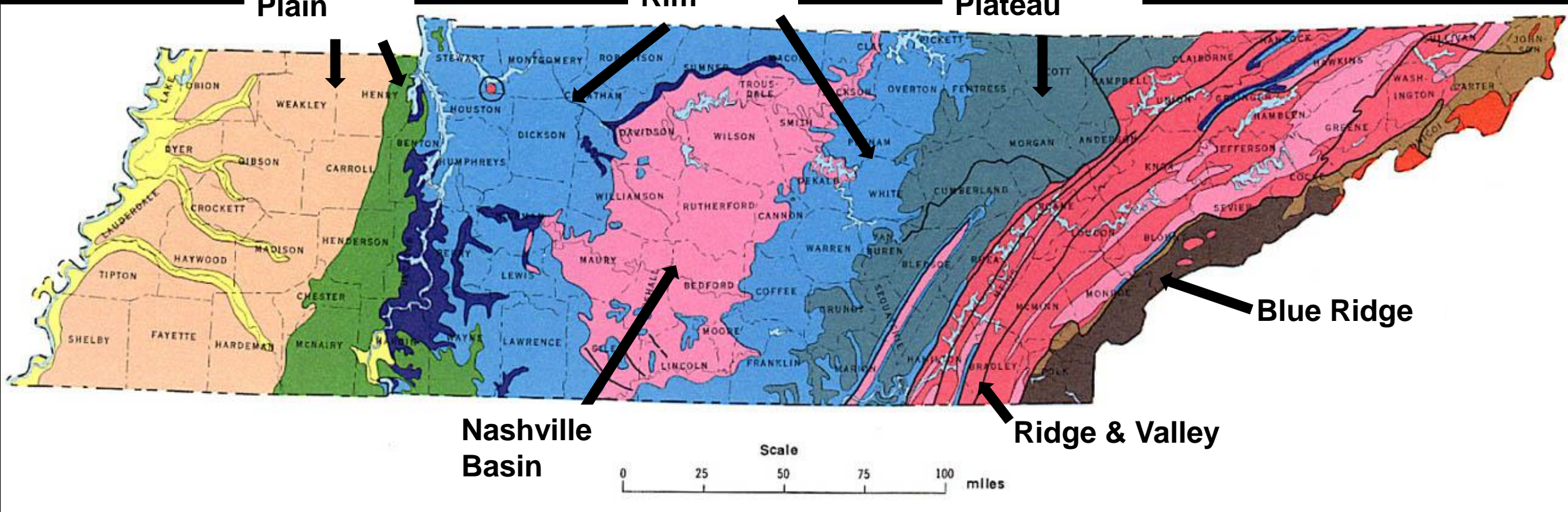


# Physiographic Provinces of Tennessee

Coastal Plain

Highland Rim

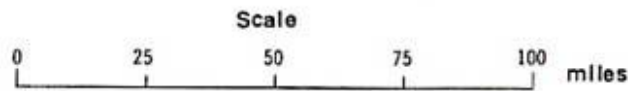
Cumberland Plateau

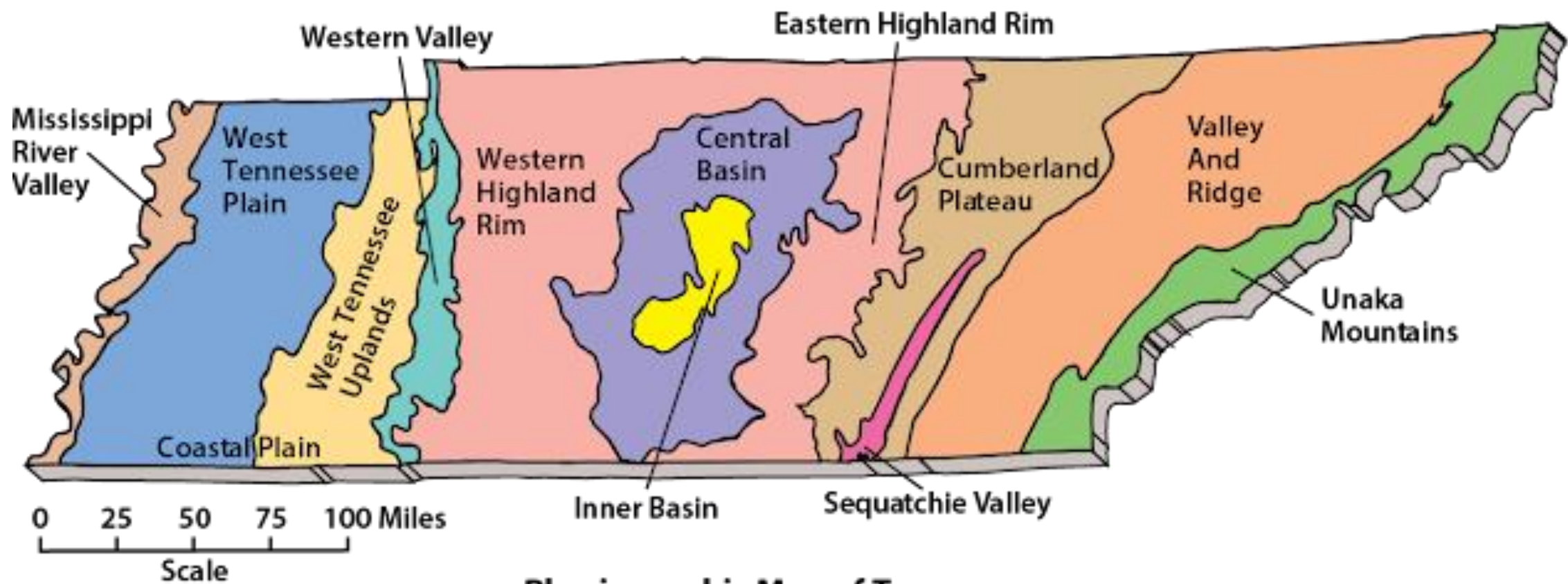


Blue Ridge

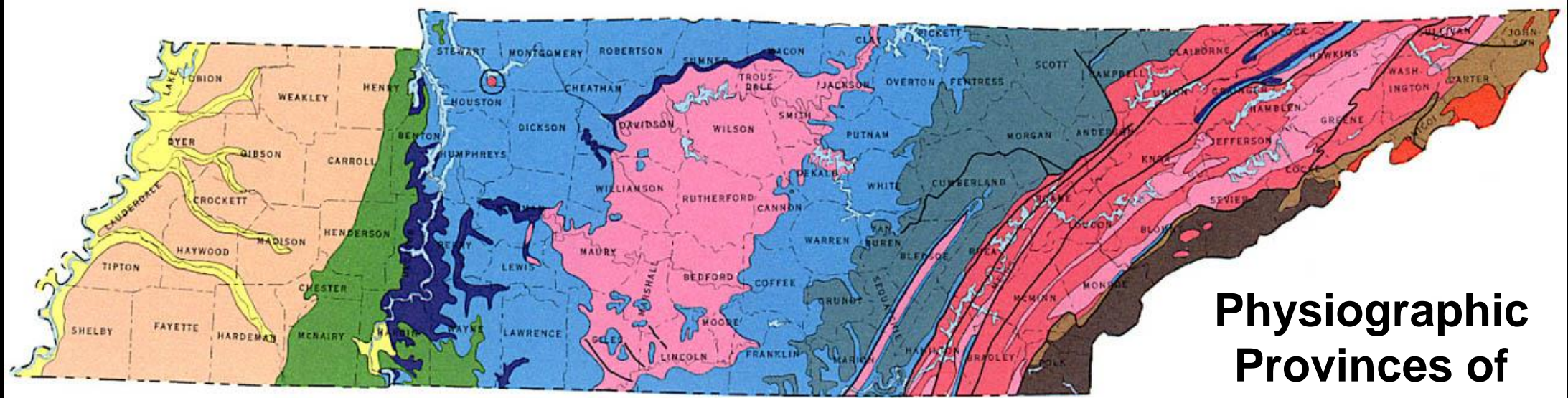
Nashville Basin

Ridge & Valley

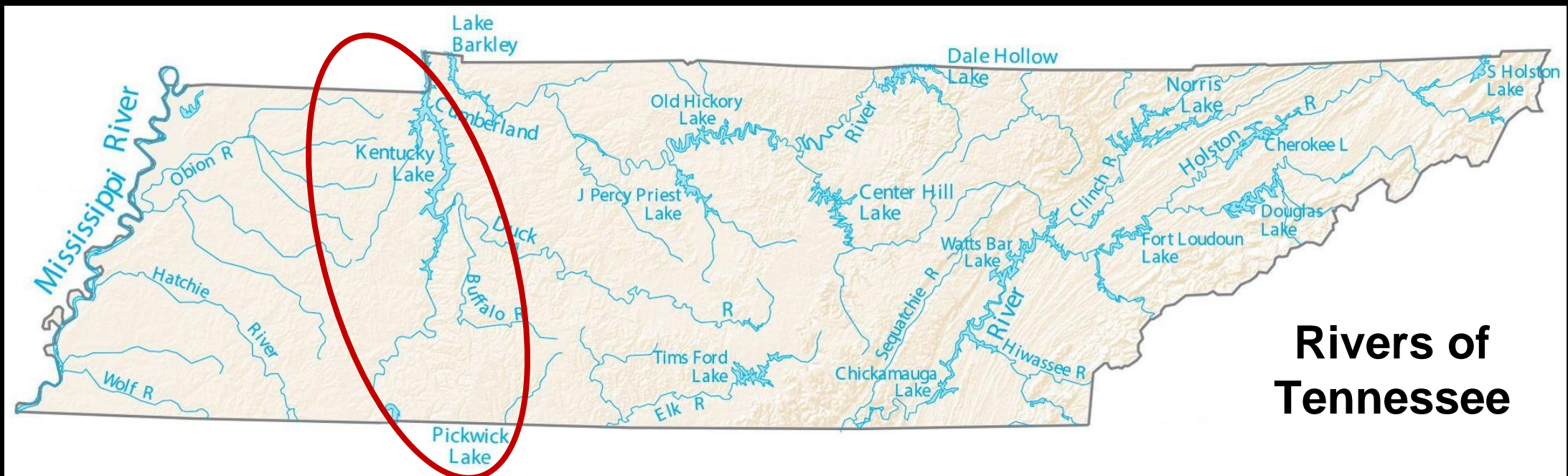
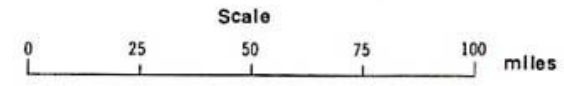




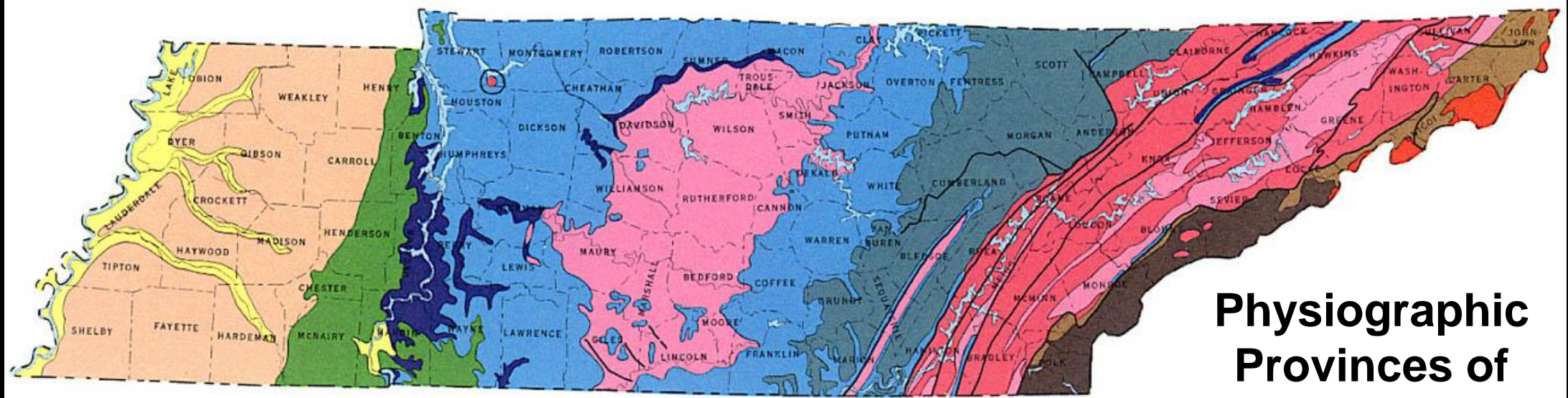
**Physiographic Map of Tennessee**



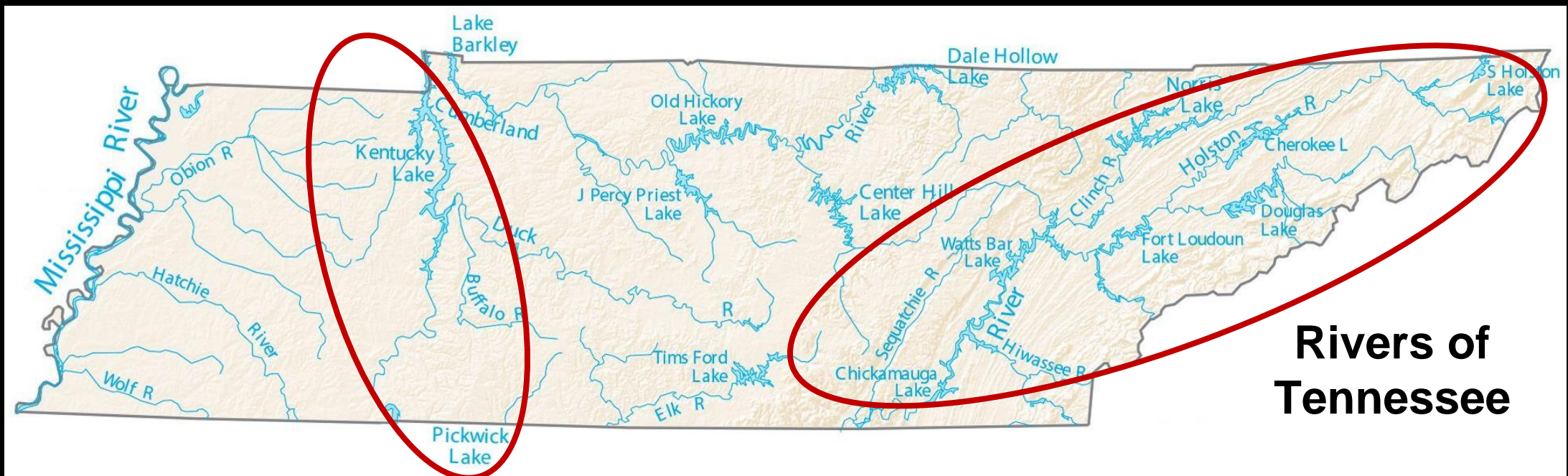
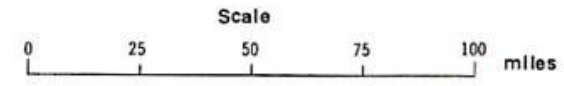
**Physiographic Provinces of Tennessee**



**Rivers of Tennessee**



**Physiographic Provinces of Tennessee**

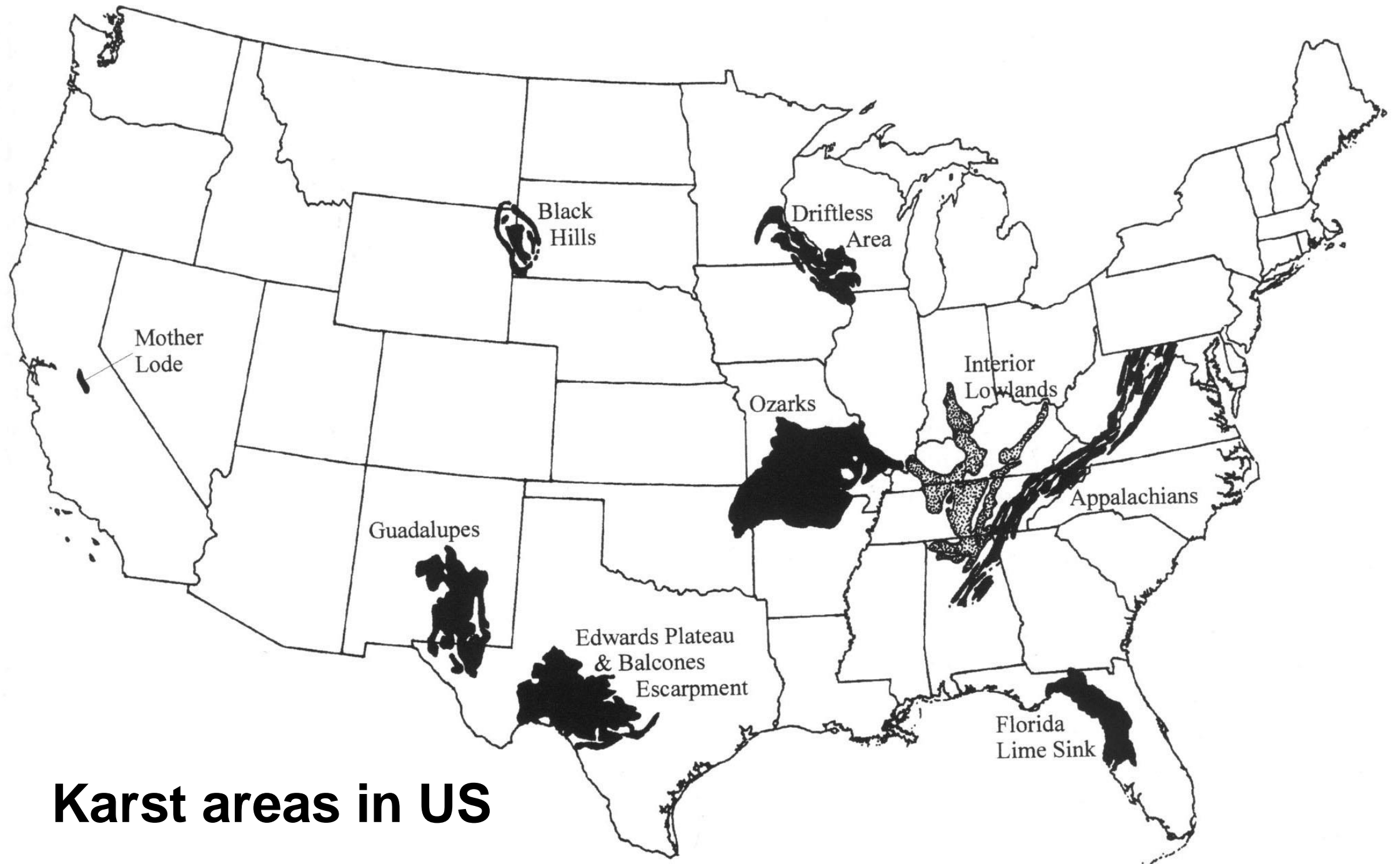


**Rivers of Tennessee**



# Stream & River Species

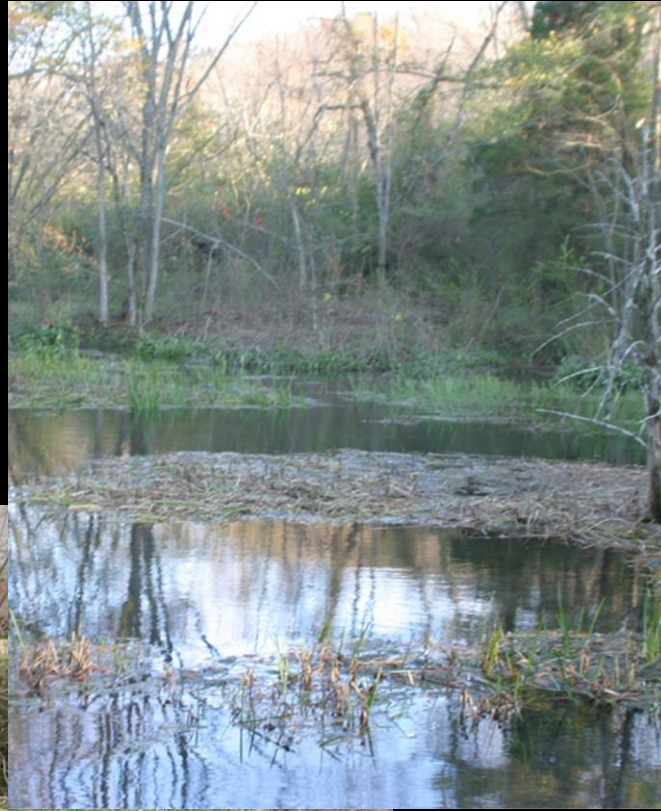




**Karst areas in US**

# Groundwater Habitats

**Springs**

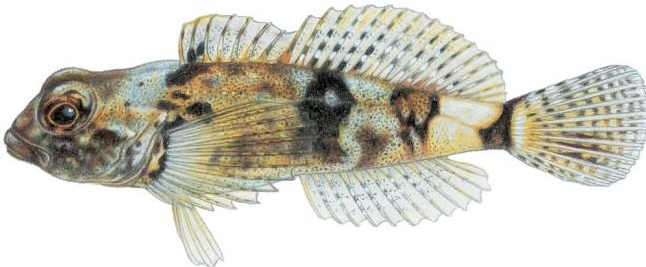
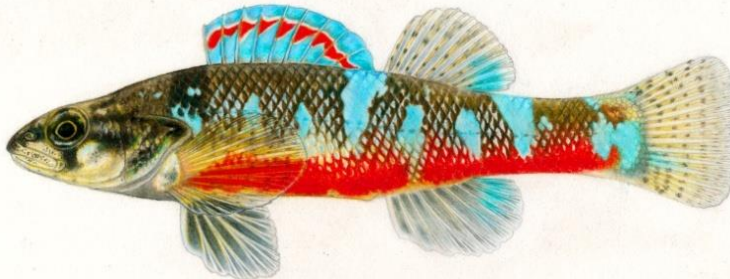
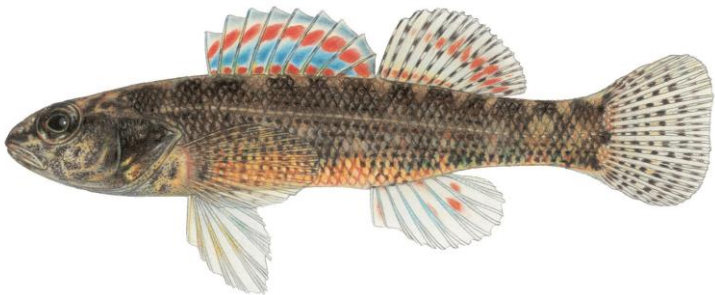
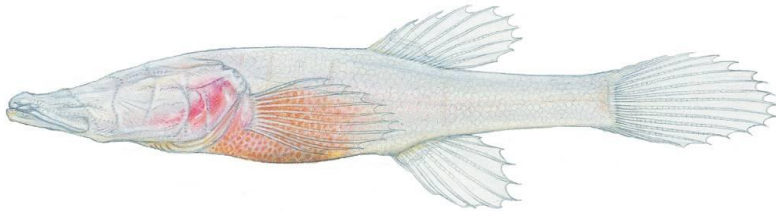


**Caves**





# Groundwater-dependent Species



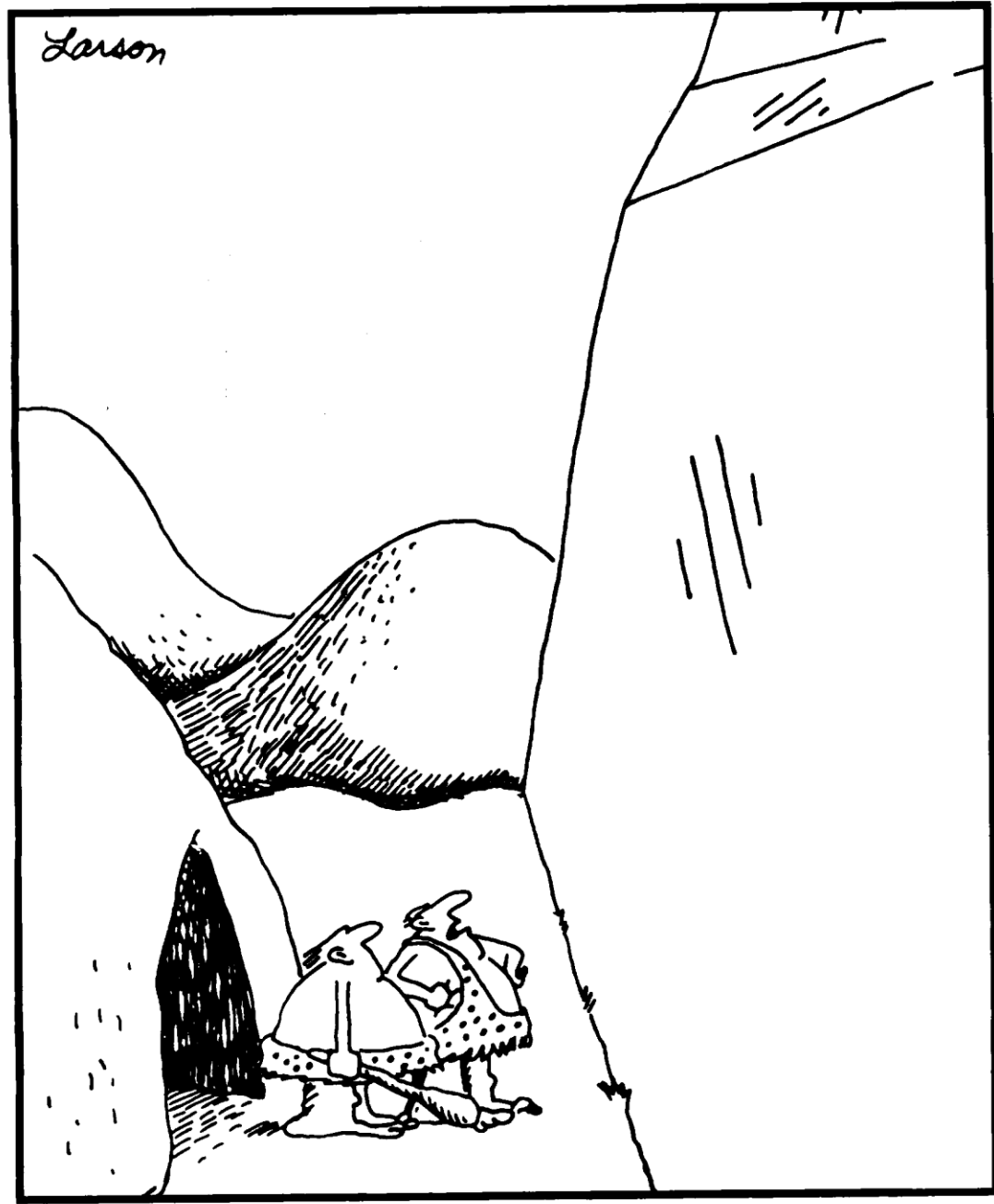
Joe Tomelleri





**Alabama Cavefish**  
***Speoplatyrhinus poulsoni***

Photos by Danté Fenolio



"Say, Thag ... wall of ice closer today?"

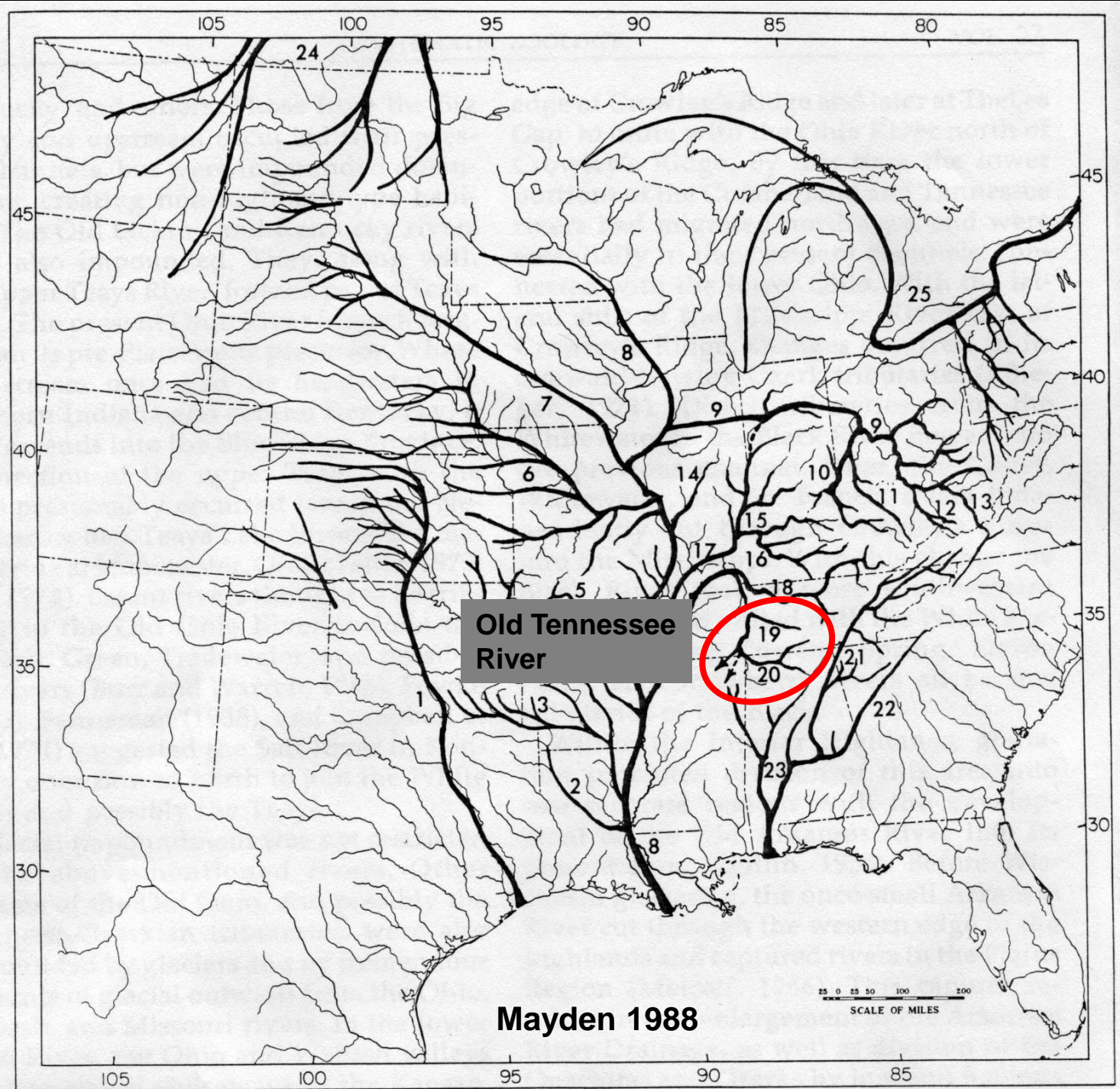
# Preglacial Watersheds

- 8. Old Mississippi River
- 9. Old Teays River
- 10. Old Kentucky River
- 11. Old Licking River
- 12. Old Big Sandy River
- 13. Kanawha River
- 15. Wabash River
- 16. Green River
- 17. Old Ohio River
- 18. Old Cumberland River
- 19. Old Duck River
- 20. Old Tennessee River
- 21. Appalachian River
- 22. Old Tallapoosa River
- 23. Mobile Basin



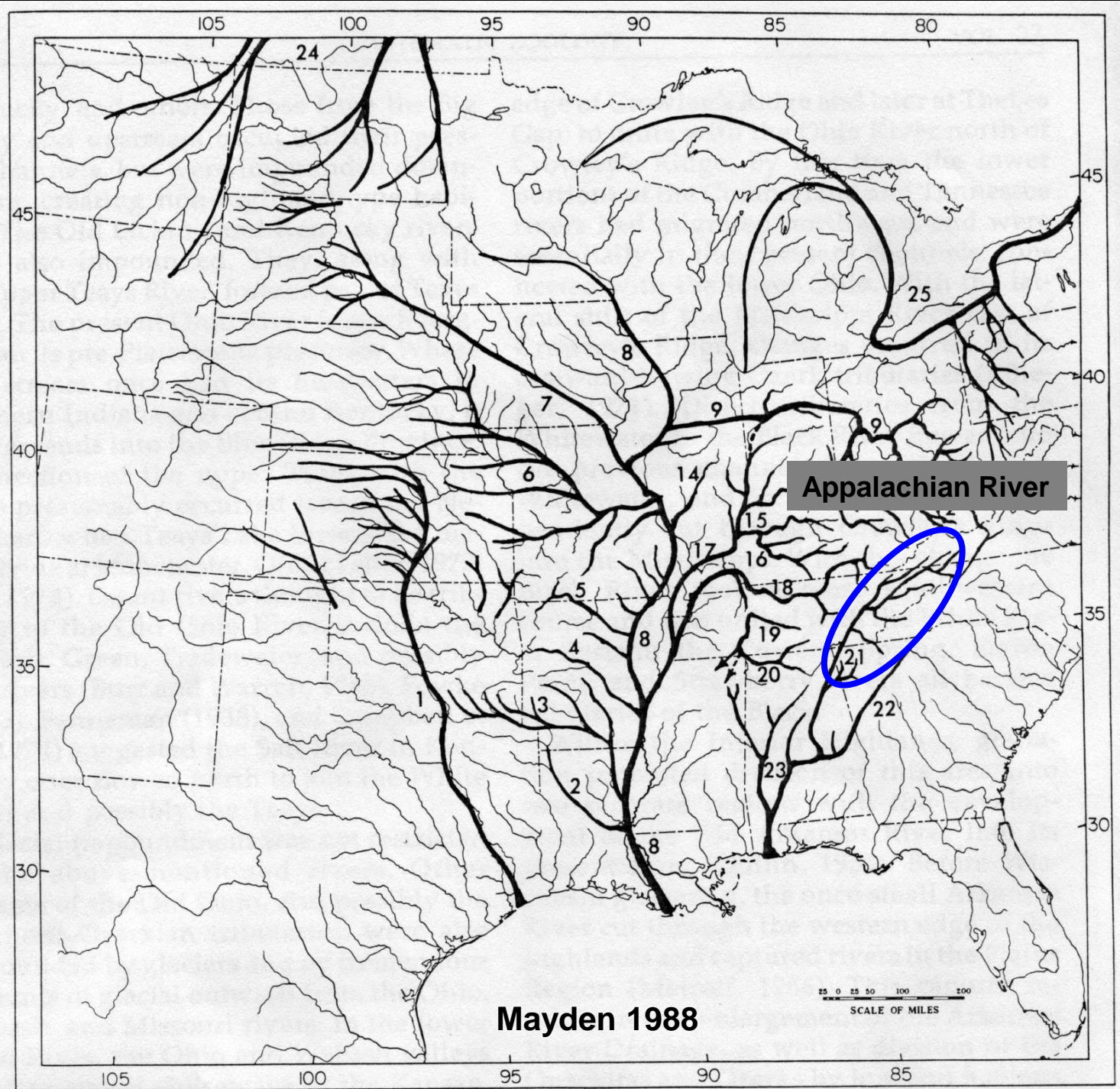
# Preglacial Watersheds

8. Old Mississippi River
9. Old Teays River
10. Old Kentucky River
11. Old Licking River
12. Old Big Sandy River
13. Kanawha River
15. Wabash River
16. Green River
17. Old Ohio River
18. Old Cumberland River
19. Old Duck River
20. Old Tennessee River
21. Appalachian River
22. Old Tallapoosa River
23. Mobile Basin



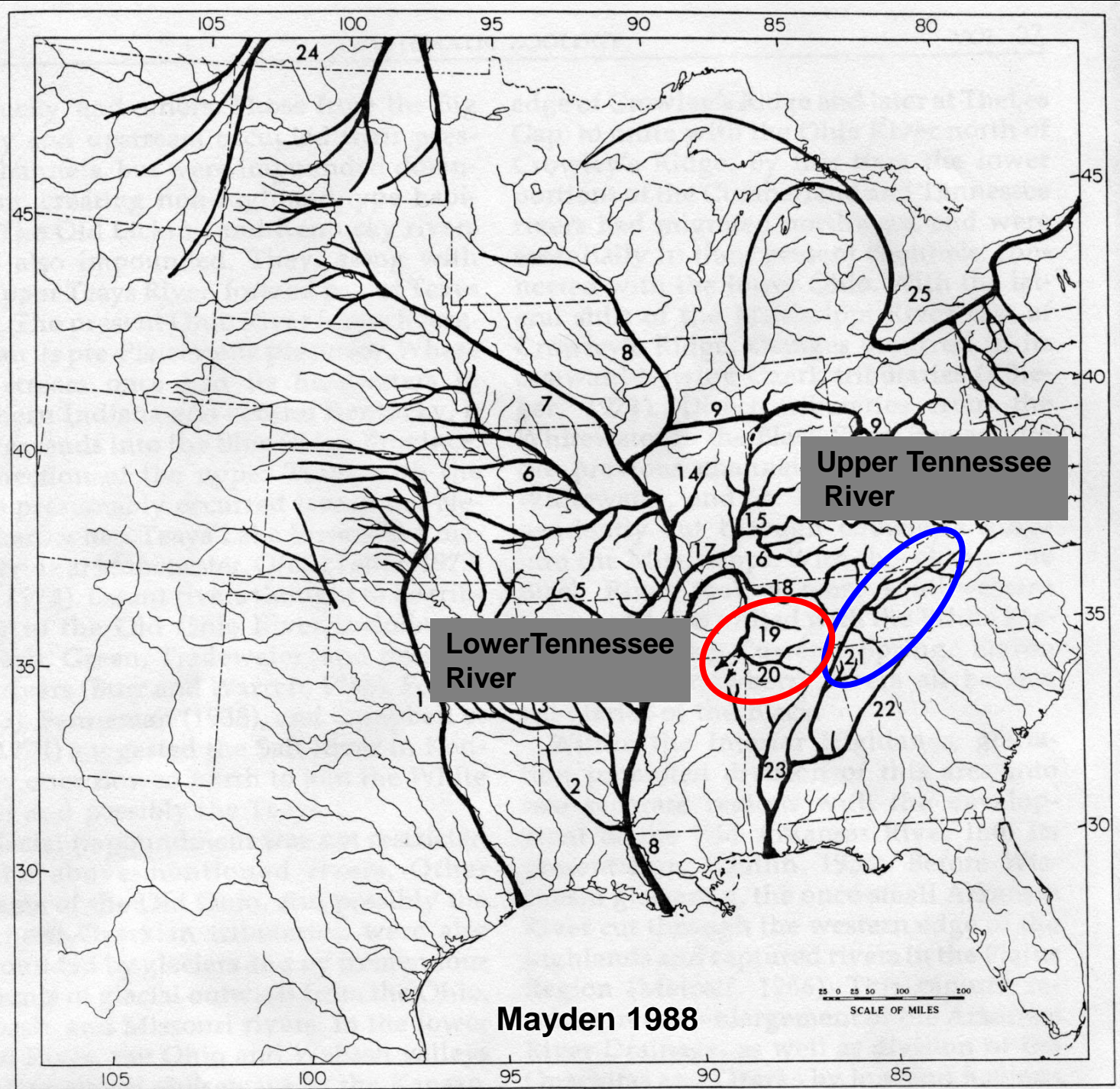
# Preglacial Watersheds

8. Old Mississippi River
9. Old Teays River
10. Old Kentucky River
11. Old Licking River
12. Old Big Sandy River
13. Kanawha River
15. Wabash River
16. Green River
17. Old Ohio River
18. Old Cumberland River
19. Old Duck River
20. Old Tennessee River
21. Appalachian River
22. Old Tallapoosa River
23. Mobile Basin



# Preglacial Watersheds

8. Old Mississippi River
9. Old Teays River
10. Old Kentucky River
11. Old Licking River
12. Old Big Sandy River
13. Kanawha River
15. Wabash River
16. Green River
17. Old Ohio River
18. Old Cumberland River
19. Old Duck River
20. Old Tennessee River
21. Appalachian River
22. Old Tallapoosa River
23. Mobile Basin

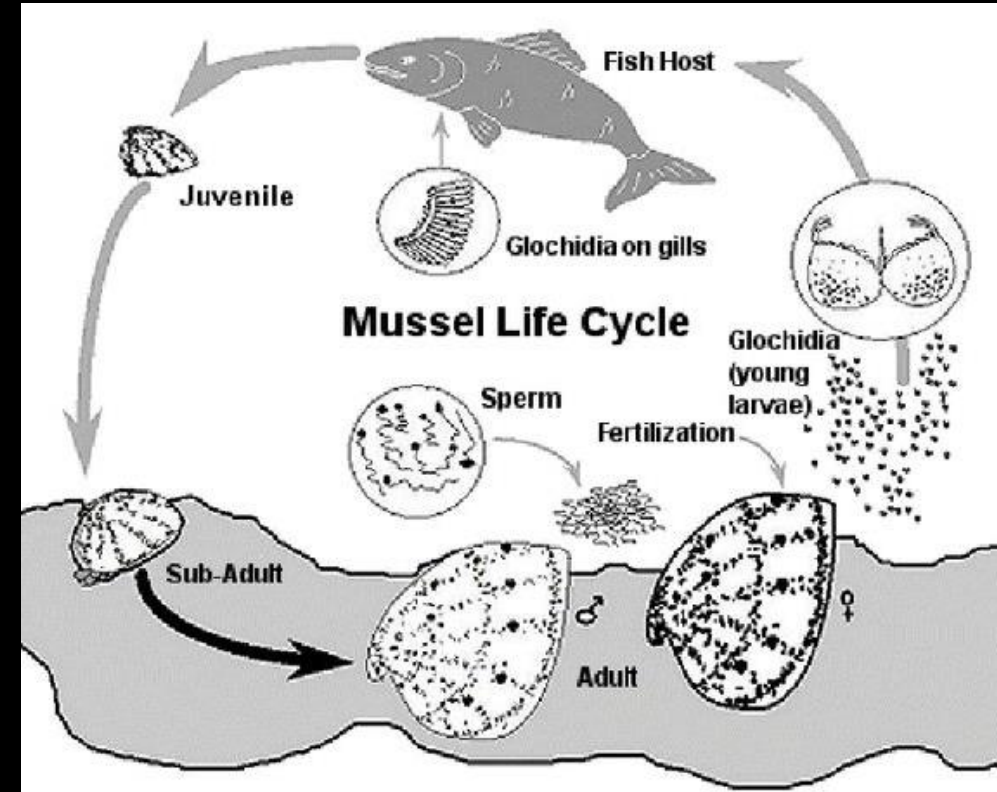




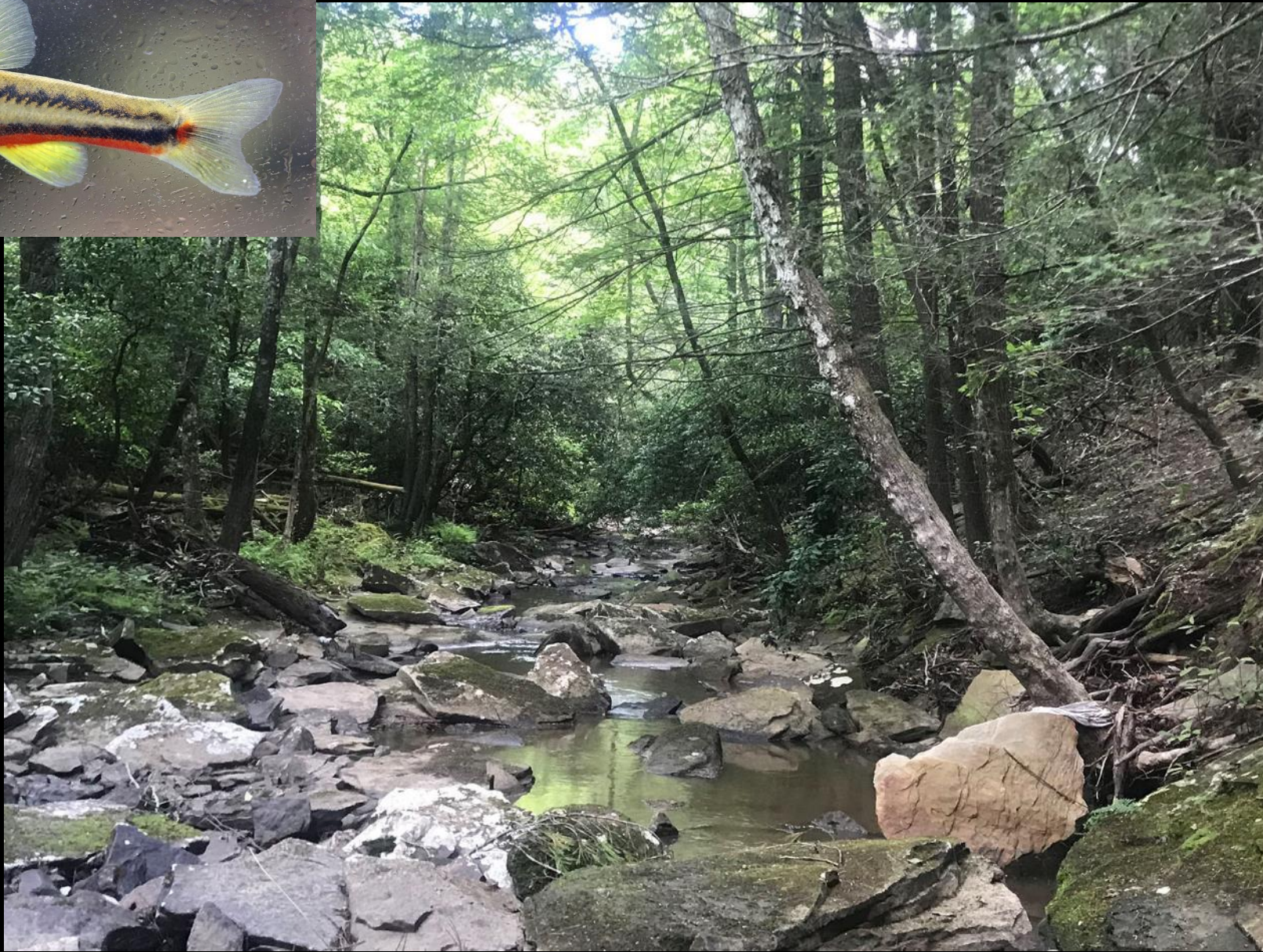












**Bumbee Creek – occupied Laurel Dace habitat**



**Historical localities, but no longer suitable habitat**

# Other Recovery Challenges





**Bumbee Creek – 2024 Drought**





# Regional Conservation Partnership Program



- **National Resource Conservation Service**
- **Regional Conservation Partnership Program**
  - **\$10 million over 5 years**
  - **Through 2018 Farm Bill**





**Cover crops, stream buffer zones**



**Exclusion fencing**

**Alternate water source**

**Rotational grazing**

**Tennessee River  
Lake Sturgeon  
Reintroduction  
Program**



# Clean Water Act 1972



**Tennessee Aquarium Conservation Institute**



# TVA Dam Improvement Program



**2,000+ Lake Sturgeon  
early June**

**About 1/2 inch long**







**Over 250,000 Lake Sturgeon released since 2000 by Tennessee Aquarium and its many partners**



**Over 250,000 Lake Sturgeon released since 2000 by Tennessee Aquarium and its many partners**







**\$46 to \$1**



**30% T&E fishes  
0.9% funding**





**Clementine**



**TENNESSEE  
AQUARIUM**