

# Culverts and Other Stream Crossings in the Etowah

Developing Ecologically Sound  
Stream Crossing Guidelines

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# Overview

- The Problem with Culverts
- Research Methods
- Sites and Counties
- Results
- Future Work Required

# The Problems with Culverts

- Culverts can segregate streams, acting as small dams.
- This is likely to prevent slow swimming fish from migrating upstream. This may lead to increased risk of local extinction.
- Engineering guidelines which account for ecosystem requirements need to be developed for stream crossings.

# Different Types of Culverts



# Research Methods

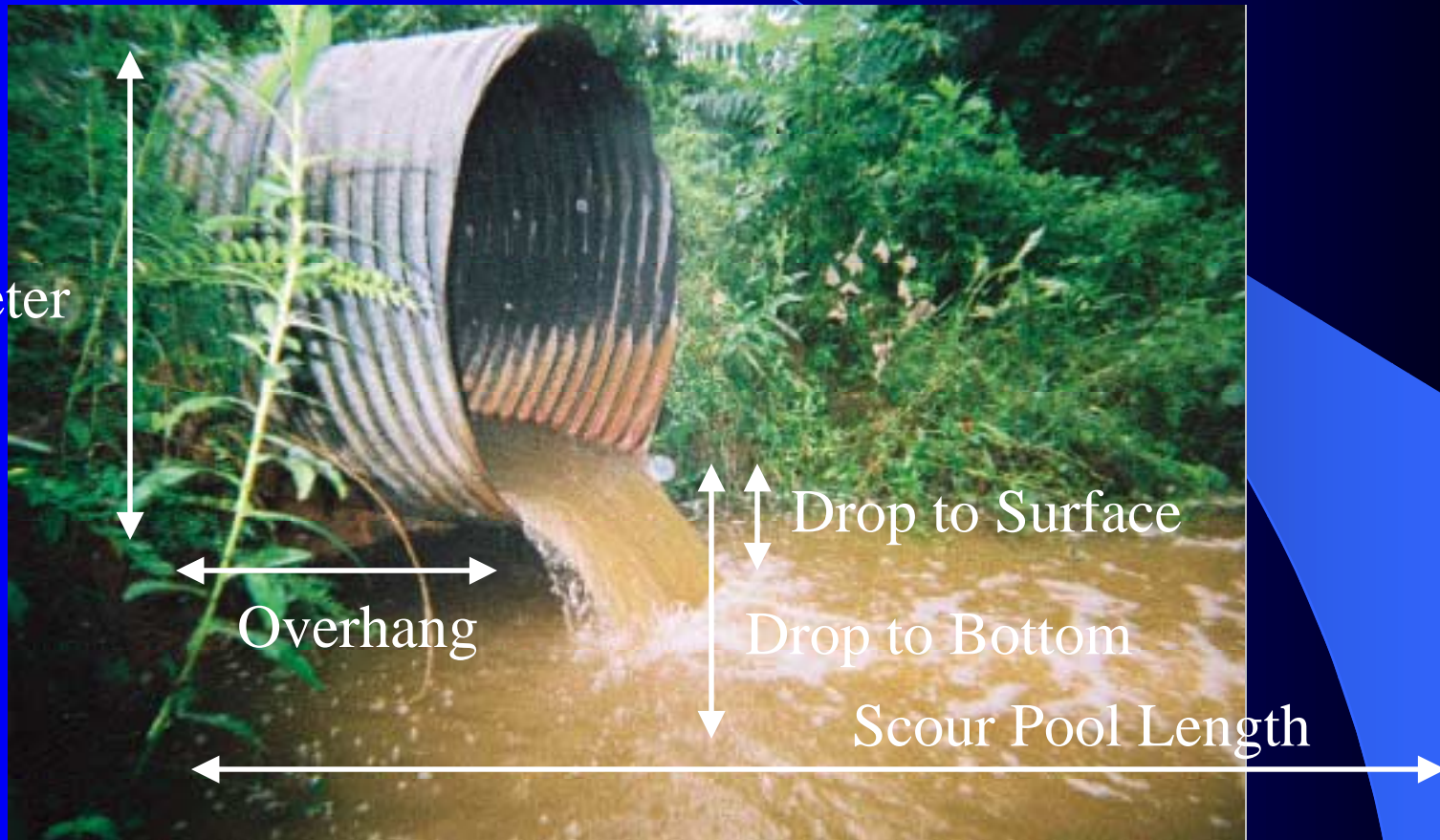
- Random – stratified site selection
  - 1-3 km<sup>2</sup>, 3-9 km<sup>2</sup>, 9-25 km<sup>2</sup>, >25 km<sup>2</sup>
  - Stratification levels selected to double two year flood
  - 20 sites in each stratification level
  - Random locations determined using global information systems (GIS) software

# Key Parameters Measured

- Culvert type and culvert dimensions – opening height, width or diameter, length, slope where possible.
- Drop from culvert outlet to stream bottom. Drop to the water surface. Overhang.
- Scour pool dimensions. Is there sediment in the culvert?

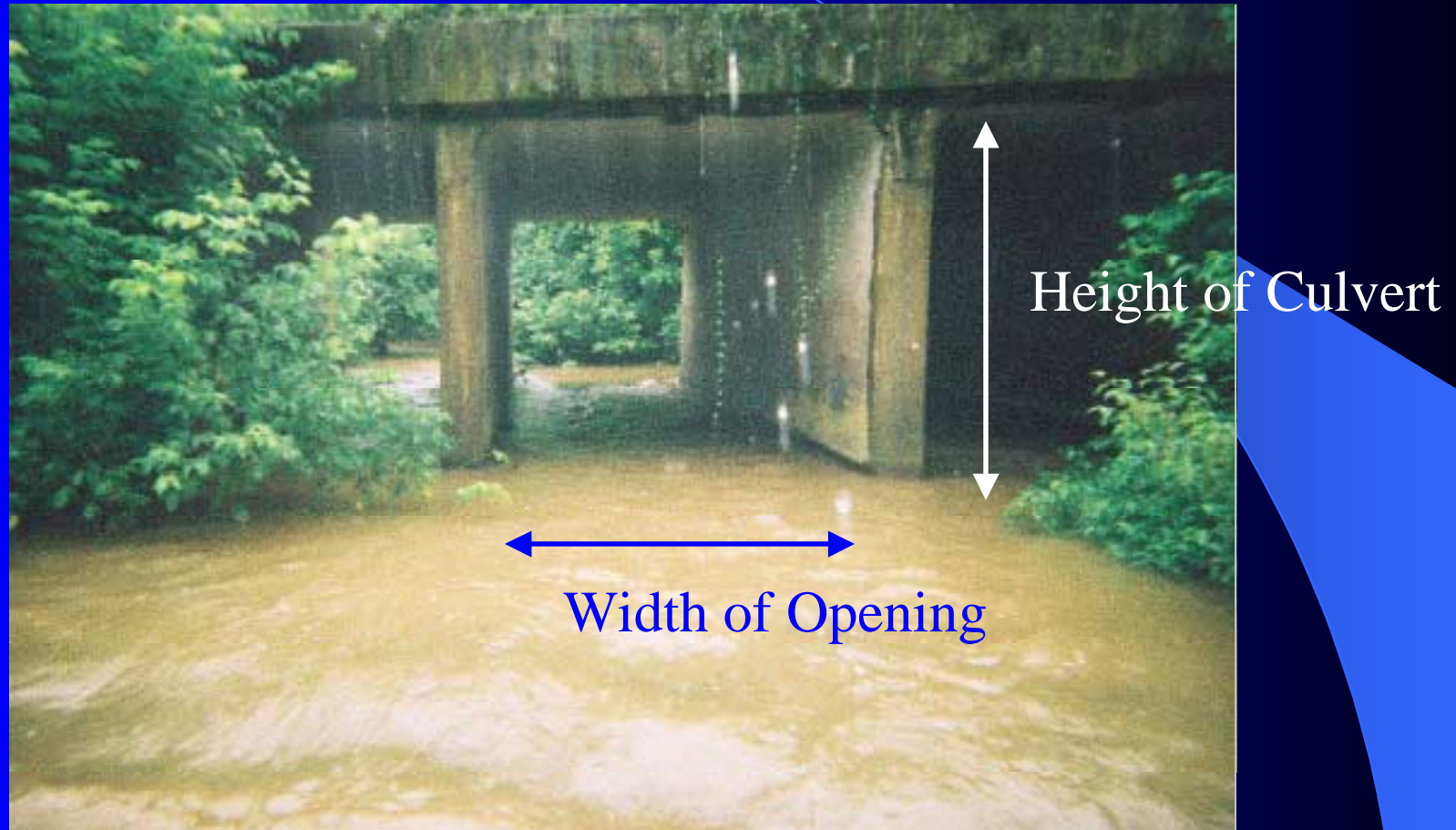
# Picture of Pipe Culvert

Diameter



A typical pipe culvert with a large overhang

# Picture of Box Culvert



**A box culvert that is potentially passable. Water is high and the culvert has sediment in it.**



# Pictures of Freespan Bridges



# Number of Sites, Counties

Total number of sites studied = 46 out of 80 (plus 8 sites not stratified)

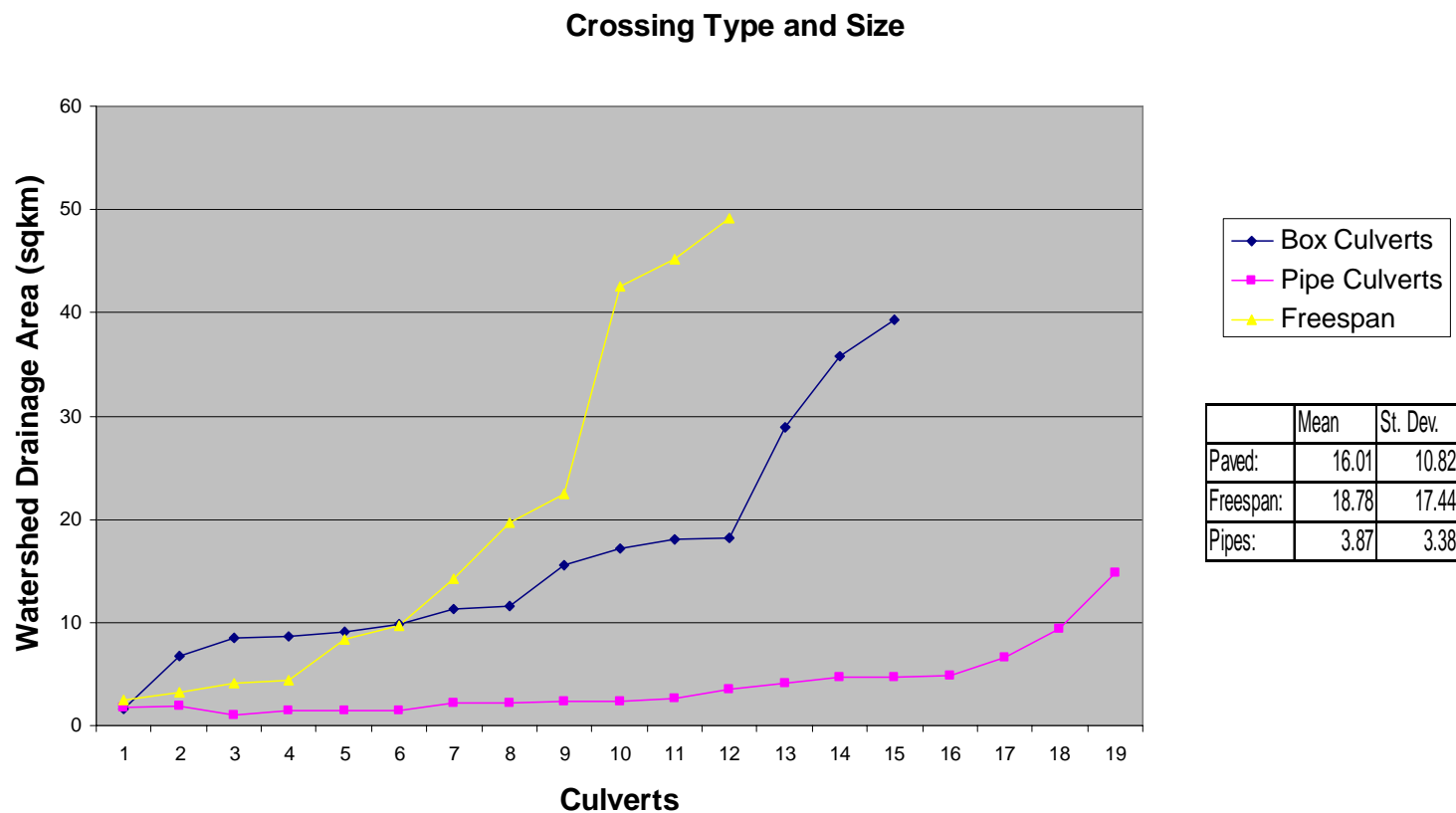
Counties studied to date: Dawson, Forsyth, Cherokee, Pickens, Fulton, Cobb

Counties still to look at: Paulding, Bartow, Lumpkin

# Results (Stratified Points)

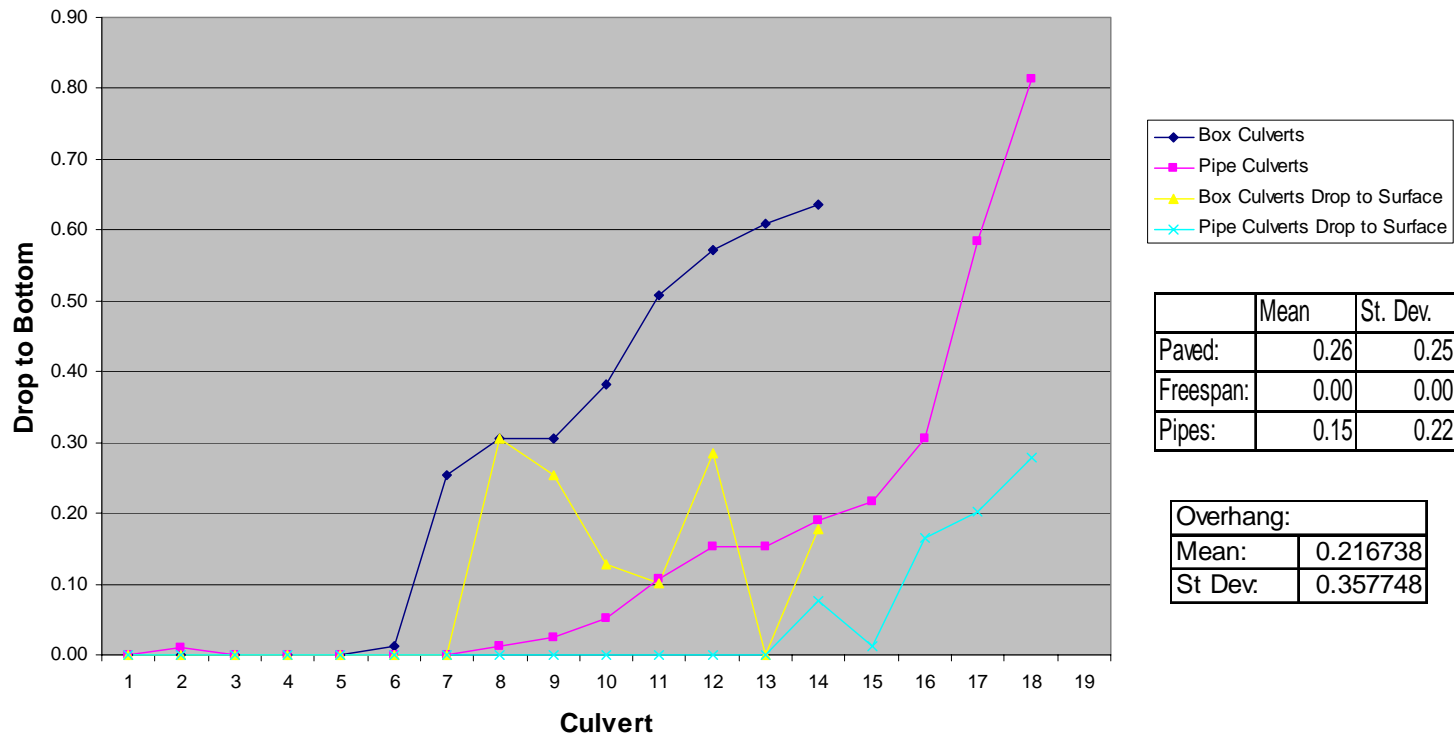
- Which culvert types are being installed, where and why
- Which culverts are problematic

# Crossing Type and Size



# Crossing Type and Drop to Bottom

Drop to Bottom and Surface for Different Culvert Types



# Future Work

- Cost analysis of different installations
- Complete data set
- Fish Studies