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Bacterial Source Tracking

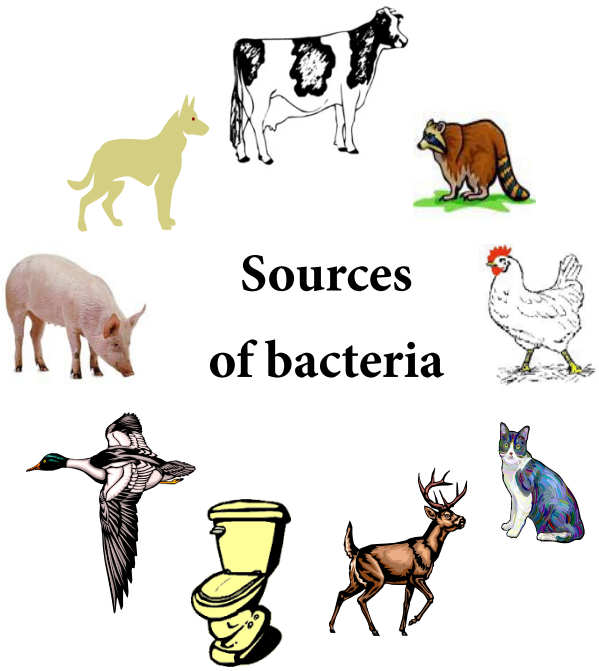
Big Cypress Creek
Bacteria Assessment Project

September 23, 2010

Steering Committee Meeting

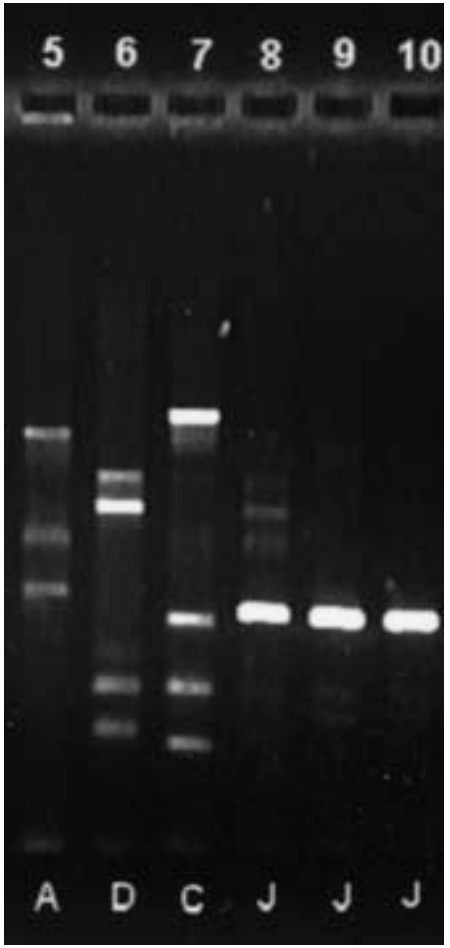
What is Bacterial Source Tracking (BST)?

- Laboratory test to determine if *E. coli* in water samples came from animal or human feces
- Library-dependent method
  - Compares DNA fingerprints of *E. coli* from water samples to fingerprint library of *E. coli* from known human and animal fecal samples
- Using large "local" watershed libraries will give us the most useful results
  - Cost and time need to be considered
  - Not always feasible



Library-Dependent BST

- Different strains of *E. coli* have specific sets of markers that help identify them
  - Similar to how fingerprints are used to identify a specific person
- Two methods of DNA "fingerprinting" used
  - **ERIC-PCR:** Enterobacterial repetitive intergenic consensus sequence-polymerase chain reaction
  - **RP:** RiboPrinting®

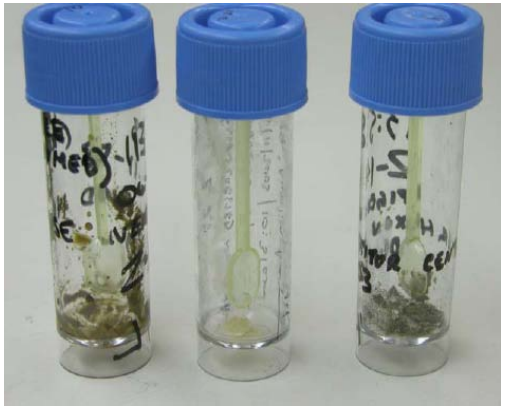


BST for the Lampasas River

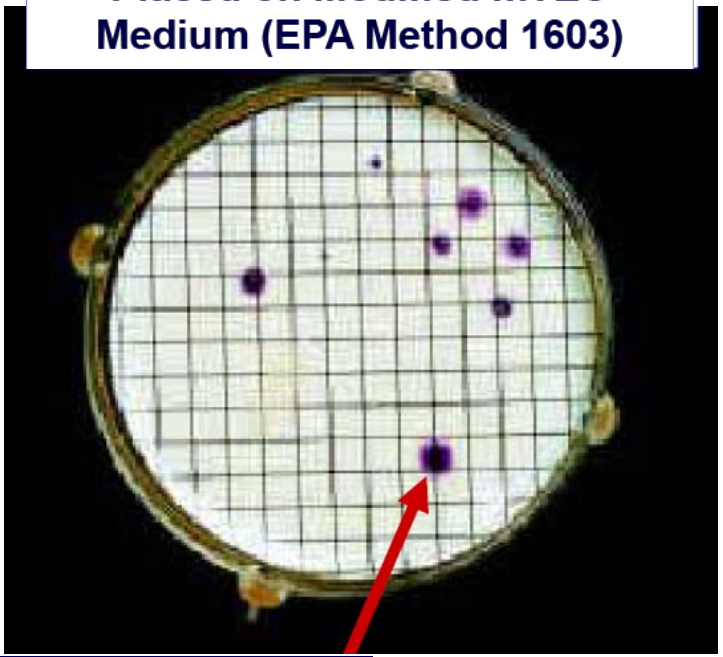
- **Conduct library-dependent BST on 144 samples from the Lampasas River watershed using both ERIC-PCR and RP fingerprinting**
- **Use Texas *E. coli* Library to identify likely human and animal sources of *E. coli***
- **In addition to using the library, 50 known-source fecal samples from the watershed will be collected**
  - **Potential to be added to the library for future use**
  - **Will help to build "local library" mentioned earlier**

Isolation of *E. coli* from feces and water

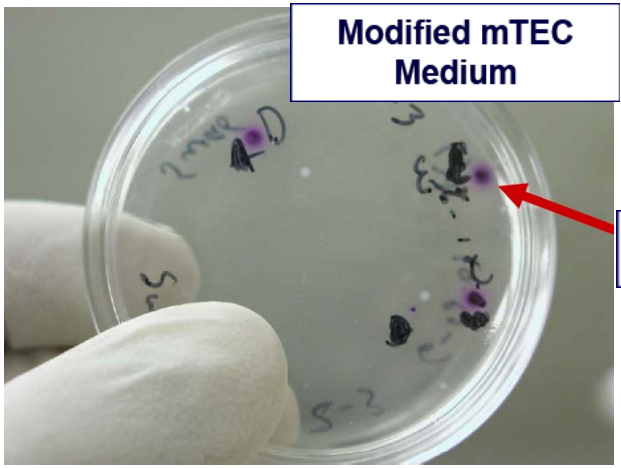
Fecal Specimens



Water Sample Filtered and Filter Placed on Modified mTEC Medium (EPA Method 1603)



Modified mTEC Medium



***E. coli* Colonies**

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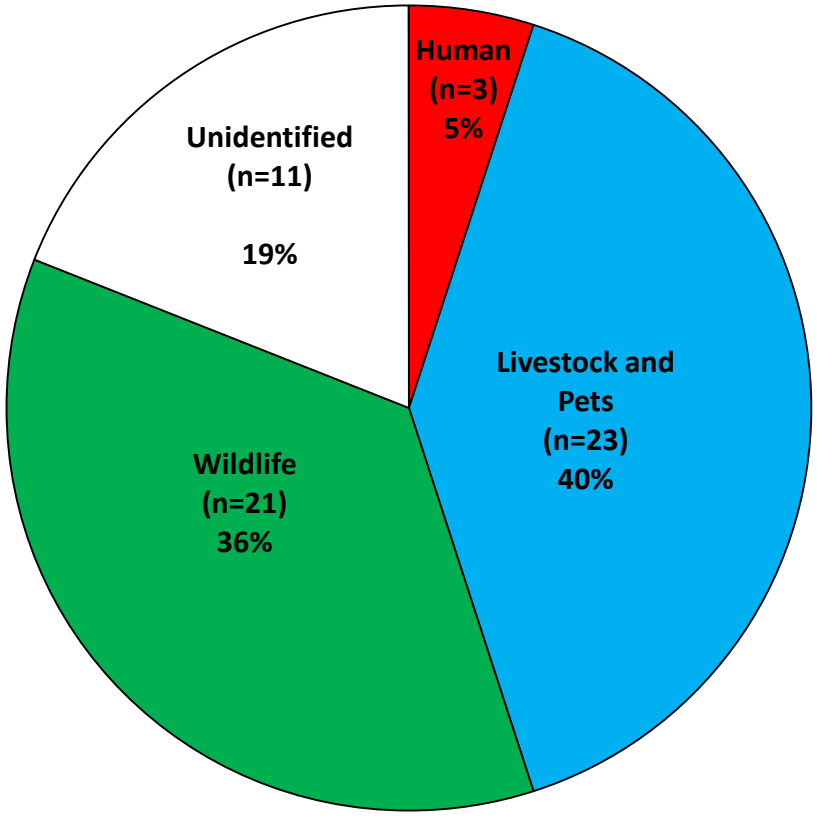
Example of *E. coli* BST Results
Base + Storm Samples – 3-Way Split

- Matches or "hits" for *E. coli* usually split into 3 categories
  - i.e., Human, Livestock and Pets, Wildlife
- Some *E. coli* cannot be identified
  - Need ≥80% similarity for match to call it a "hit"
  - Insufficient matches classified as "unidentified"
- Unidentified *E. coli* can be from:
  - Animals not currently in library
  - Less than min % match, *E. coli* strains not in library



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Questions?

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