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**
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
Questions?

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