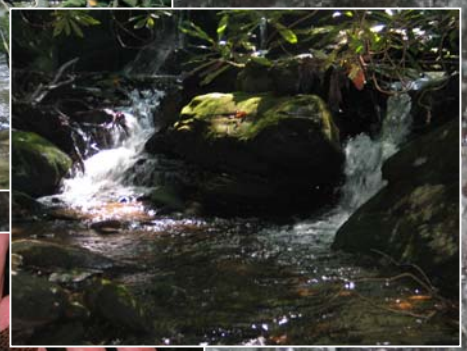
Fecal Coliform and *E. coli* in the Headwaters of the Brasstown Creek Watershed



University of Georgia

Cooperative Extension Service

By:

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Cooperators

- Union and Towns County Commissioner
- Chestatee-Chattahoochee Resource Conservation and Development
- University of Georgia
  - Union County Cooperative Extension Services
  - Agricultural and Environmental Services Labs
- Brasstown wildlife

Agenda

- Watershed Description
- Monitoring Methods
- TMDLs
- Fecal Coliform standards and *E. coli* Criteria
- Results
- Conclusions

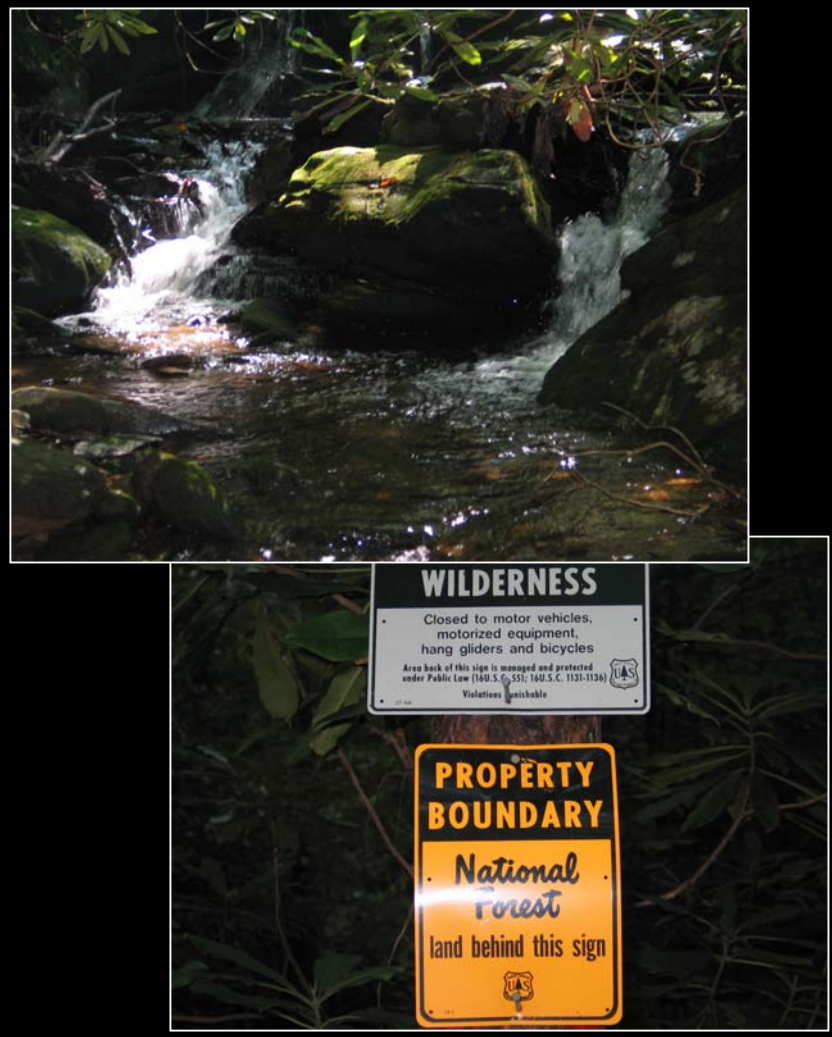
Objective

- Determine the level of fecal coliform and *E. coli* in headwaters of Brasstown Creek
- Use this information as the background level for Brasstown Creek to assist TMDL implementation

Union County Georgia

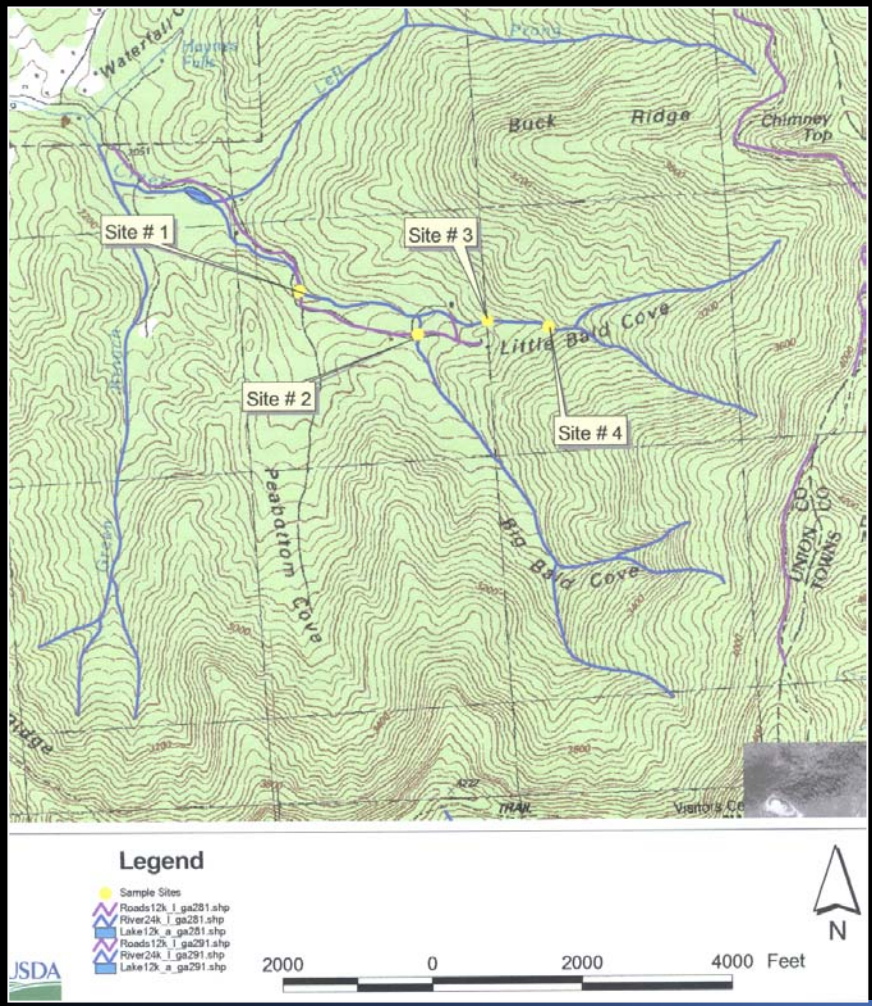
Union County

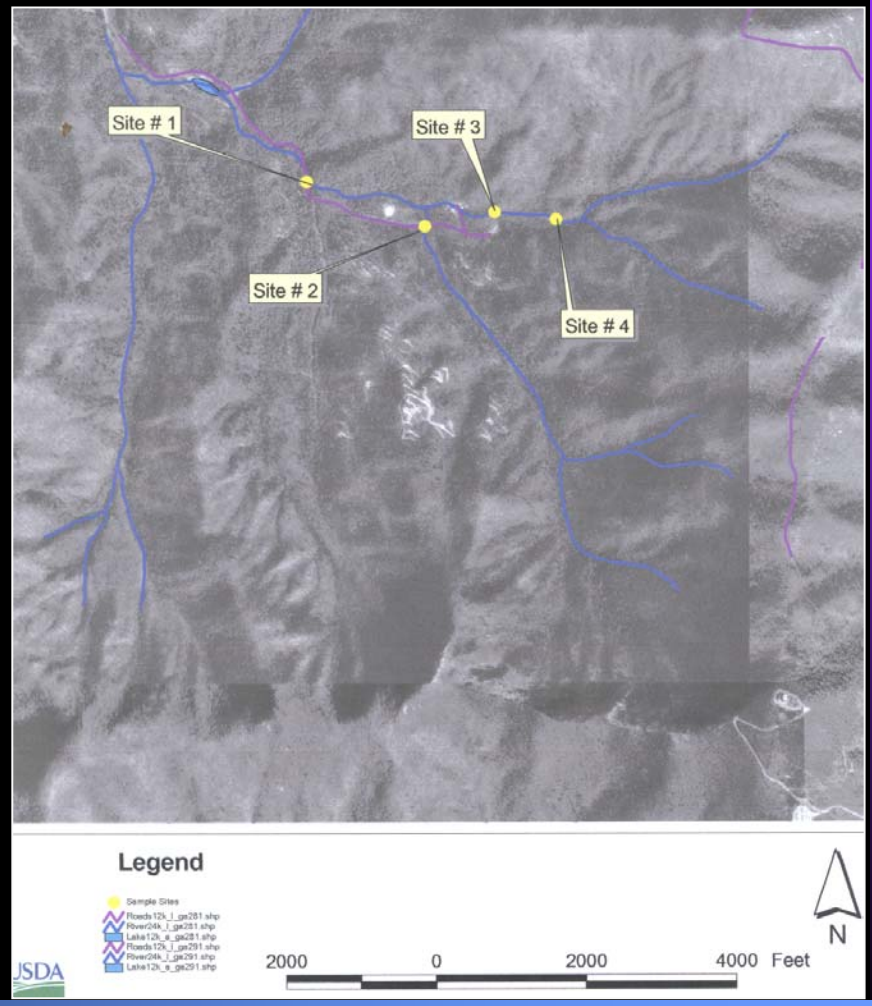
Watershed Description



- Headwaters of Brasstown Creek
- Only one house in sampling area
- No agricultural animals
- Wilderness area
- Trout stream

Brasstown Creek Sampling Locations





Monitoring Methods

- Collected grab samples all within an hour beginning at the lowest point and moving upstream
- Samples were collected approximately weekly for a month to calculate geometric means
- Samples were delivered to the Lab and analyzed the same day of collection
  - Fecal Coliform by multiple tube fermentation using A1 media
  - *E. coli* by Idexx, Inc. Colisure™ and Quantitrays™ (ONPG-MUG media)

Methods continued…….

- Stage was measured at site 1 using a staff gauge
- Geometric means were calculated for the four seasons (spring, summer, fall, and winter)

Georgia EPD Fecal Coliform Standard for Water Contact Activities

- Geometric mean (GM)
  - $GM = (Y_1 * Y_2 * Y_3 * Y_4)^{1/4}$
  - At least 4 samples
  - Over a 30-day period
  - At least 24 hours apart

Fecal Coliform Standards…cont.

- May thru October
  - GM not to exceed 200 MPN/100-ml
  - No individual samples exceeding 4,000 MPN/100-ml
- November thru April
  - GM not exceeding 1,000 MPN/100-ml
  - No individual sample exceeding 4,000 MPN/100-ml

Escherichia coli Criteria in other States

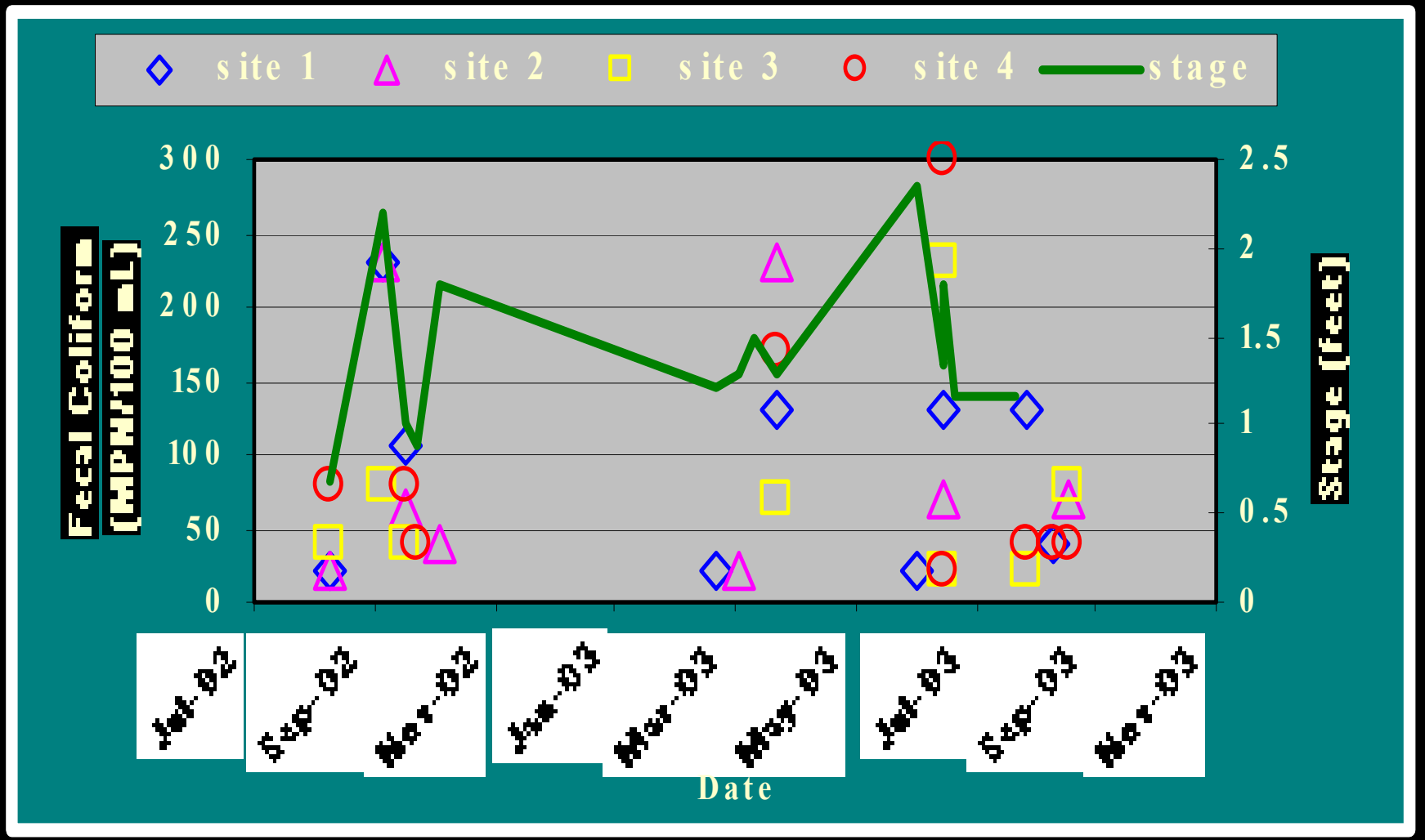
- GM not to exceed 126 MPN/100-ml
  - No individual samples exceeding 576 MPN/100-ml
  - Based on statistics for 8 illnesses per 1000 exposures

303(d) Listed for TMDLs to Reduce Fecal Coliform

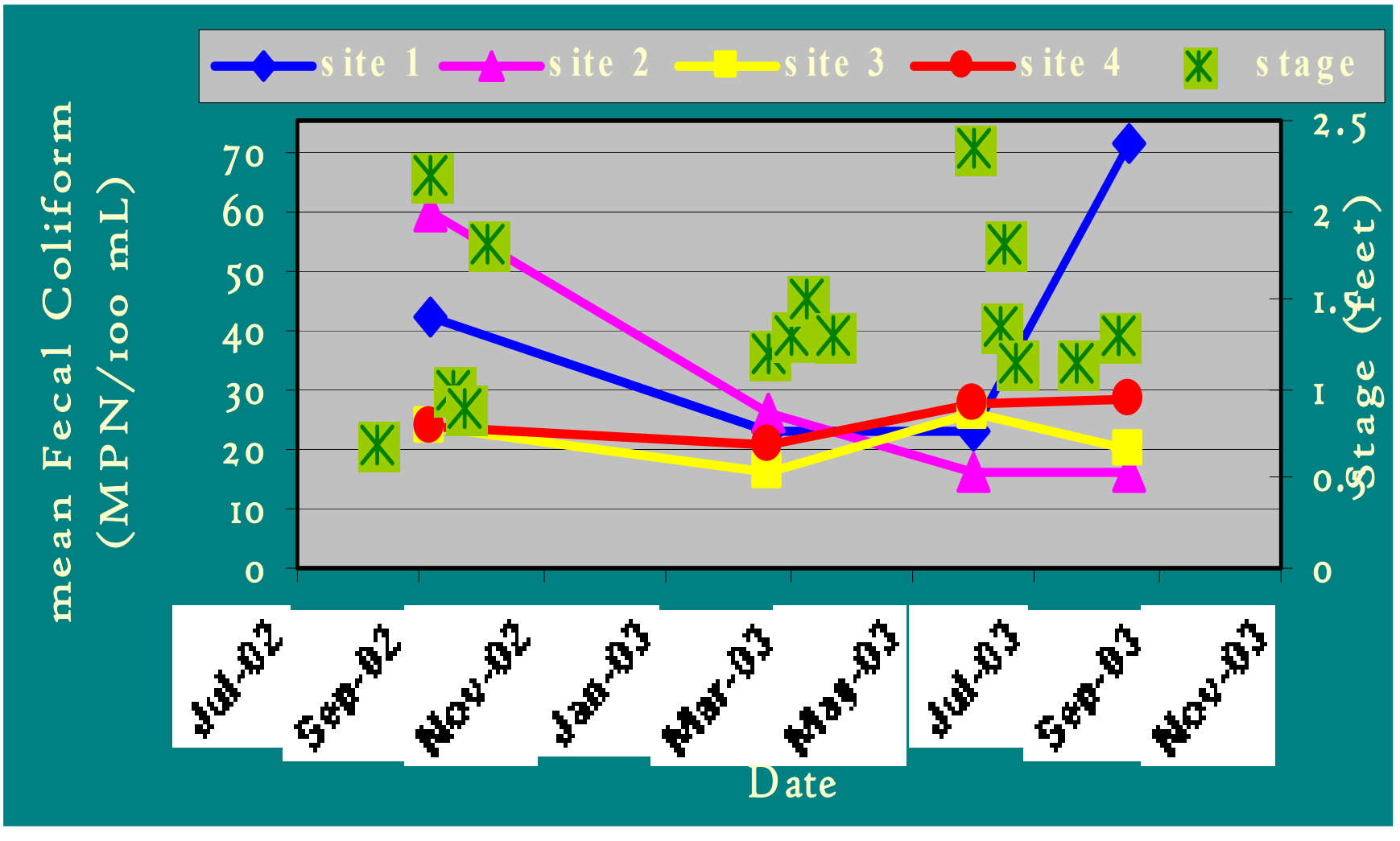
- Impaired reach:
  - Little Bald Cove to
  - Yewel Branch
- Impaired Level:
  - 354 MPN/100 mL
- Target Level:
  - 150 MPN/100 mL

- Sources
  - Urban runoff
  - Illicit discharges
  - Leaking sewer lines
  - Failed septic systems
  - Domestic animal waste
  - Municipal biosolids
  - Wildlife

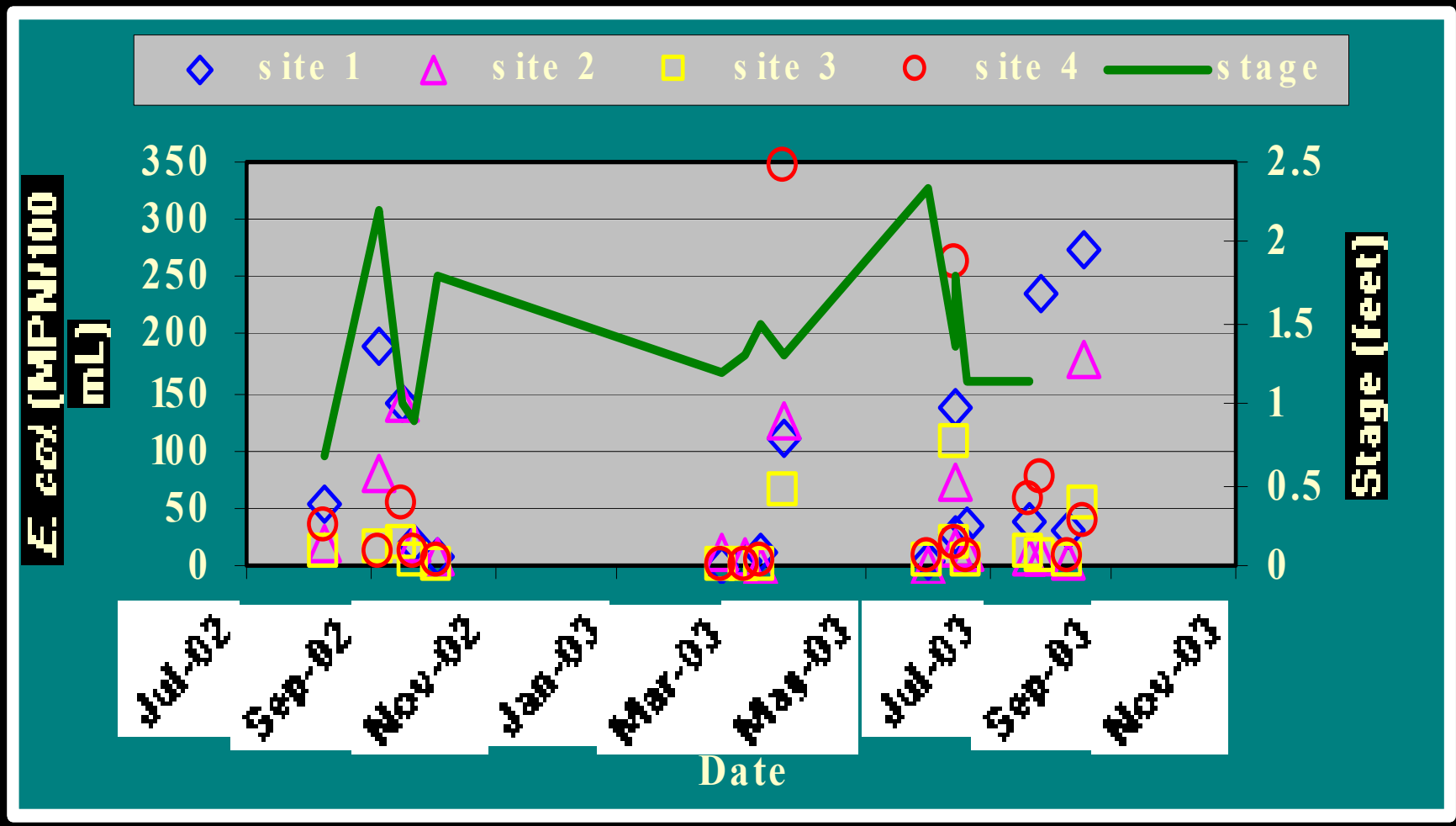
Individual Sample Fecal Coliform



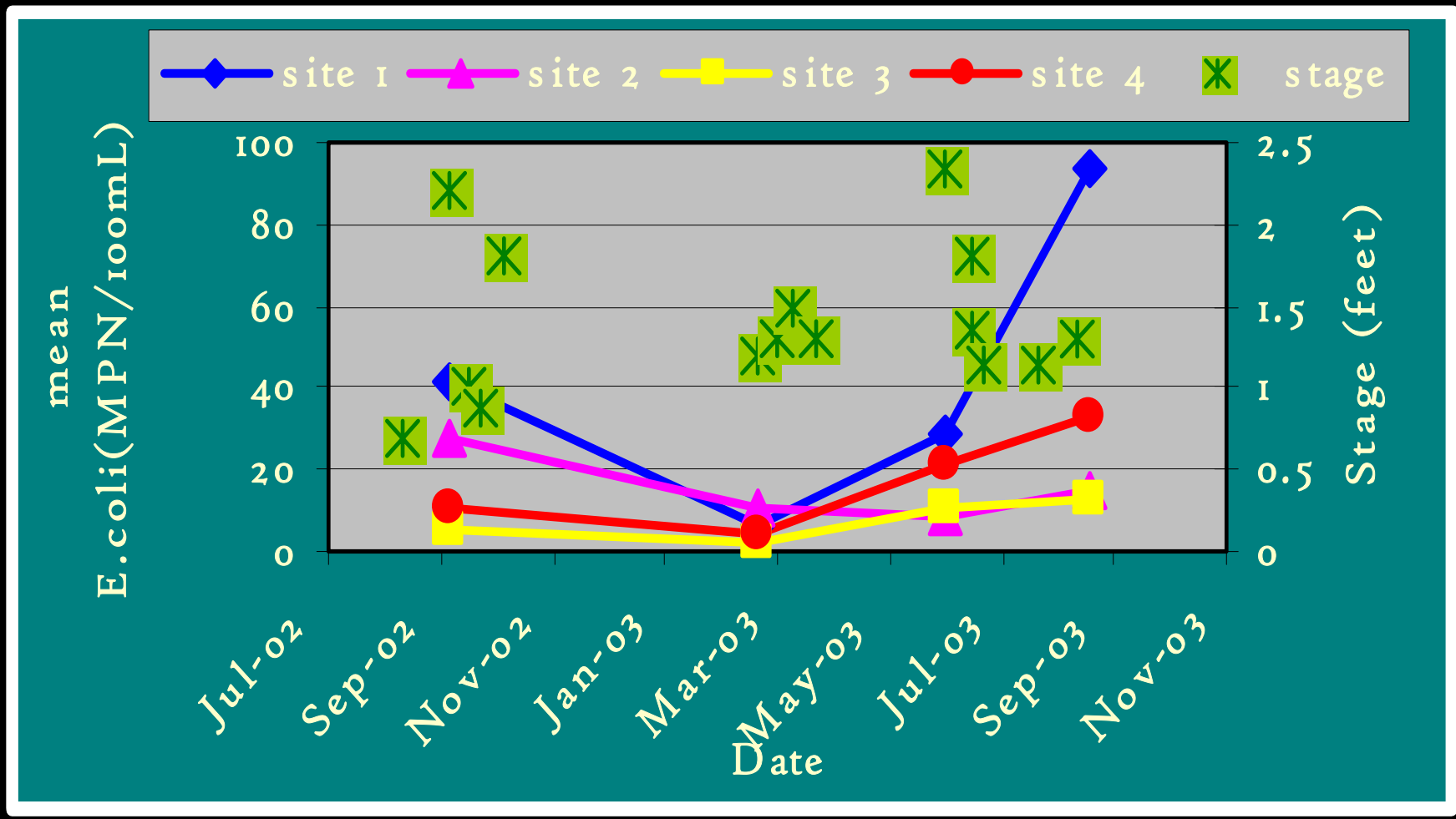
Geometric Mean Fecal Coliform



Individual Sample *E. coli*



Geometric Mean *E. coli*



Percentage of Target from Wildlife

	E. coli	Fecal Coliform
site	% of Target*	% of Target**
1	44	26
2	16	20
3	8	14
4	18	17
average	22	19
* 75% of 126 (95)		
**75% of 200 (150)		

Conclusions

- All Fecal Coliform levels were below Georgia's In-stream Standards for the:
  - geometric means <200
  - individual samples <4,000
- *E. coli* produced similar results with slightly lower geometric means
- On average, wildlife contributed approximately 20% (11 to 48%) of the TMDL target level
  - Fecal Coliform Target (150)

How will this information be used?

- Comprehensive land-use plan
- Education:
  - Local government
  - Livestock producers
  - Developers
  - Watershed coalition
- Provide to the Resource Conservation District for TMDL target refinement