Little Shades Creek Restoration: Project Results & Future Initiatives

ADEM Nonpoint Source Conference

January 24, 2012

Kellie Johnston and Greg Jennings

Cahaba River
Clean Water Partnership

Little Shades Creek

Ashley Woods subdivision

City of Vestavia Hills, AL

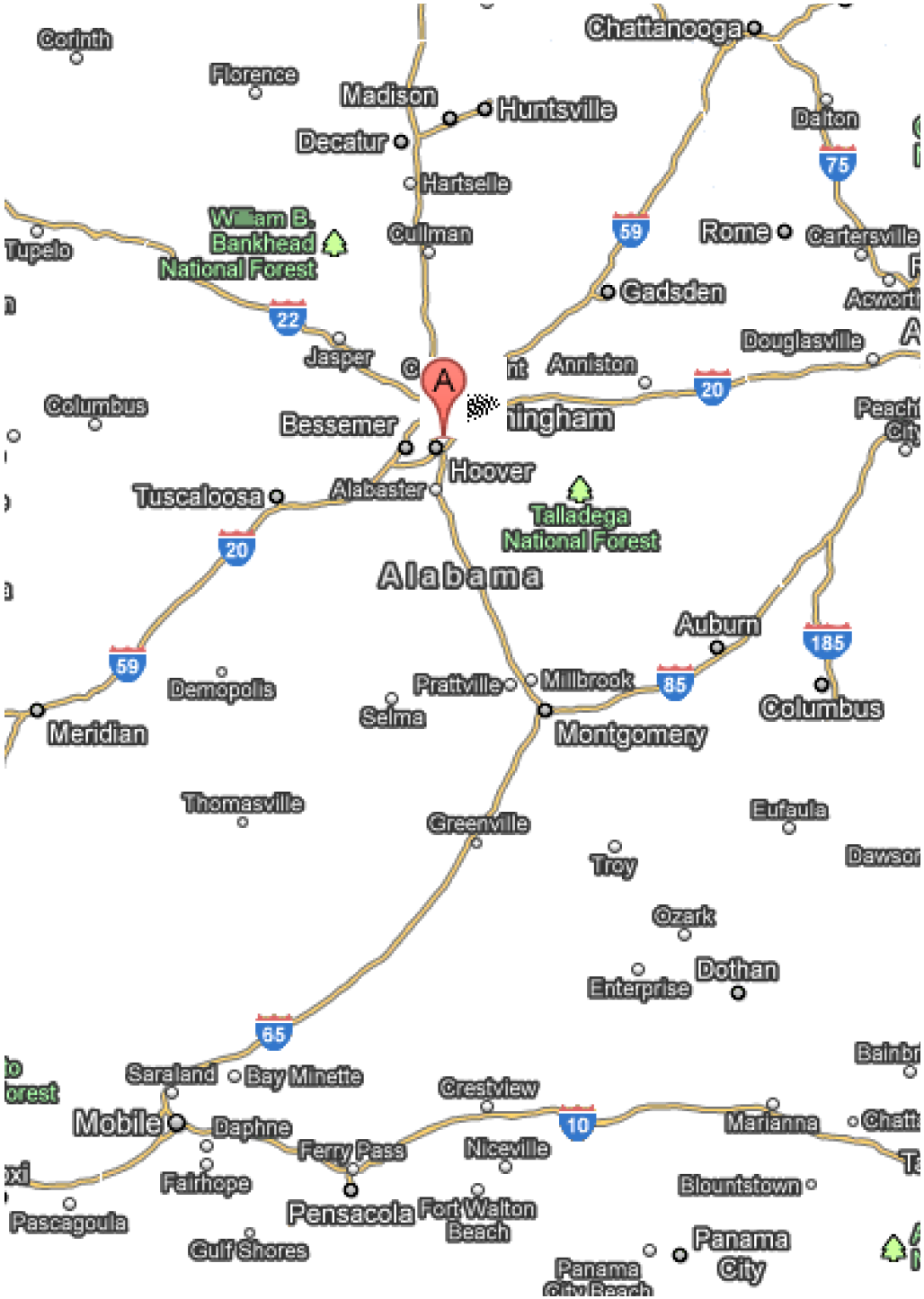
Jefferson County

Tributary to Shades Creek

Cahaba River Basin

Drainage Area = 8 sq miles

Impervious Surface = 35%



July 2008

- Contacted by Goodwyn Mills & Cawood on behalf of the Ashley Woods Homeowner's Assoc.
- Performed site visit.
- Developed proposal for Cahaba Clean Water Partnership Project Bank.

August 2008:
Grant Approved by ADEM

Project Partners

- ADEM
- US Environmental Protection Agency
- City of Vestavia Hills
- Cawaco Resource Conservation & Development Council, Inc.
- Cahaba River Basin Clean Water Partnership
- Alabama Cooperative Extension System
- Ashley Woods Homeowner’s Association
- The Nature Conservancy
- Alabama Department of Transportation
- North State Environmental
- North Carolina Cooperative Extension
- Goodwyn Mills & Cawood, Inc.
- Representatives Jabbo Waggoner
- Representative Greg Canfield
- Representative Jack Williams
- USDA/NRCS
- Morgan Properties

Grant Objectives

- Control erosion and reduce sedimentation utilizing natural channel design techniques
- Install BMPs to remediate runoff from urban sources.
- Provide education regarding nonpoint source pollution and effective stormwater management techniques.

Grant Deliverables

- 1,900 feet restored stream using natural channel design.
- Enhance existing constructed wetland.
- Workshops to promote natural channel design for improving water quality and aquatic habitat.
- Workshops to promote innovative stormwater runoff water quality and quantity best management practices.
- Development of a watershed-based management plan.

Need: Protect water quality + infrastructure

Opportunity: Community Support + Technical Expertise + Administrative Persistence

Project Specs

1,900 feet stream length

30-60 feet riparian buffer

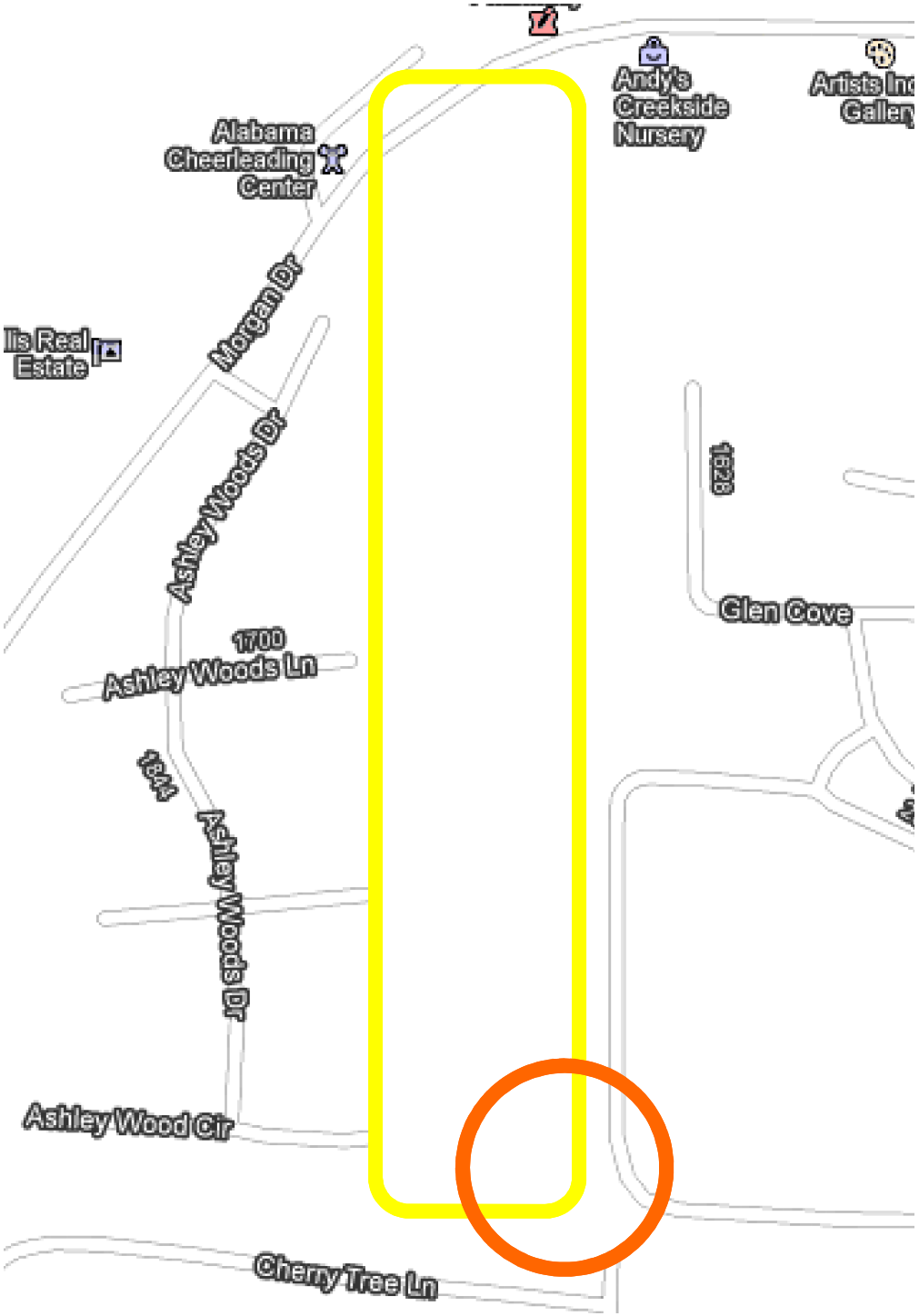
0.5 acre stormwater wetland

10 stormwater outfall channels

Sewer crossing

Greenway trail on East bank

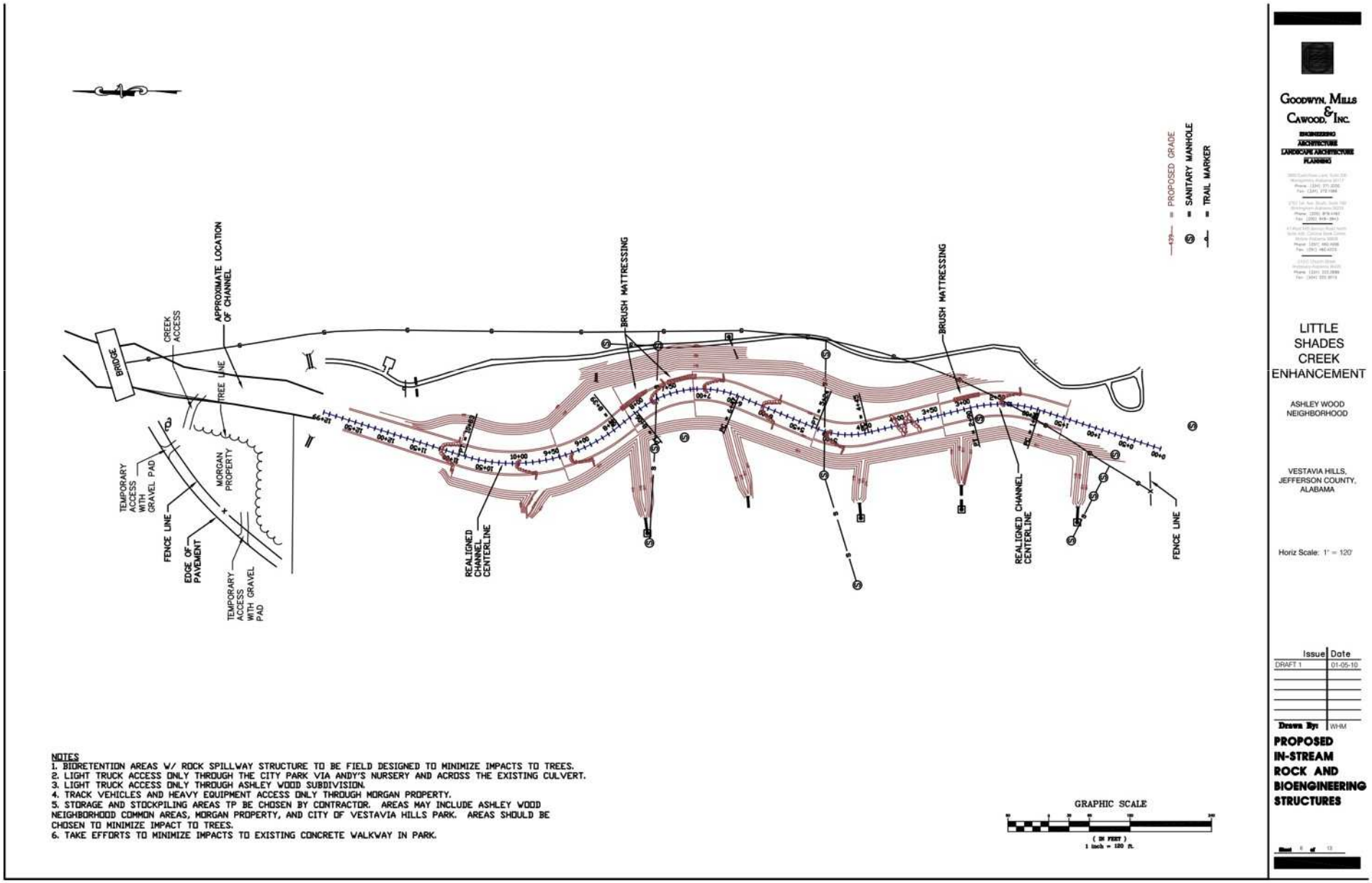
Gravel/cobble – high bedload



Project Components

1. Channel morphology
2. Floodplain structure
3. Hydrologic & hydraulic analysis
4. In-stream structures
5. Habitats & vegetation
6. Site & watershed conditions
7. Monitoring, maintenance, education

Engineering Design: William McLemore, PE



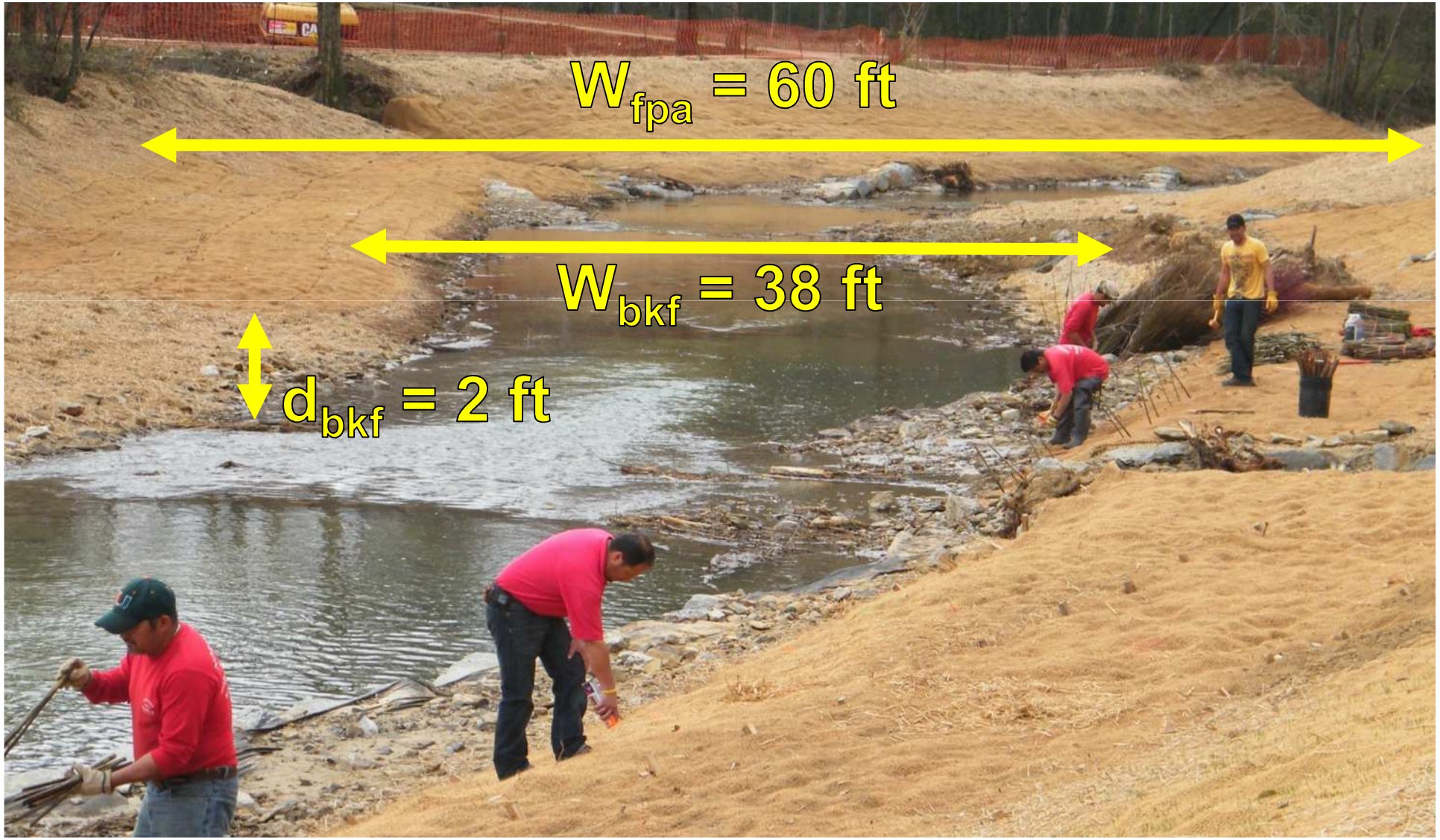
Priority 3: Excavate narrow floodplain benches in confined corridor

ER = 1.6
W/d = 19
K = 1.2
R_c/W = 2-3

Construction:
Jan-Mar, 2010

Entrenchment Ratio = W_{fpa} / W_{bkf} = 60/38 = 1.6

Width to depth Ratio = W_{bkf} / d_{bkf} = 38/2 = 19



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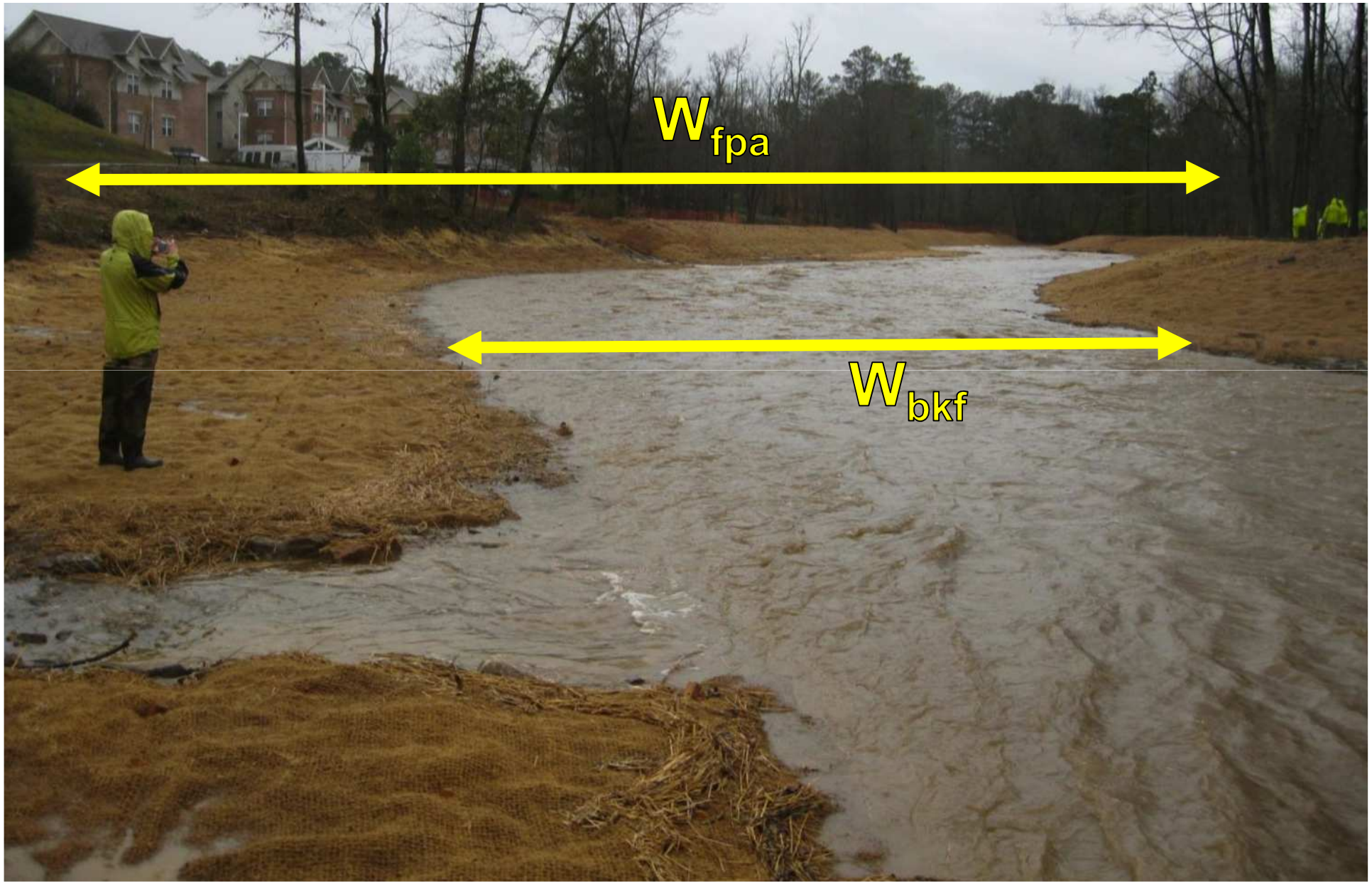

In-Stream Structures (11): Boulder & Log

- Grade Control
- Bank Protection
- Sediment Transport
- Habitat Enhancement

Boulder Vanes (J-hooks)

- 3-6 % arm slopes
- 20-25 degree arm angles
- Boulder footers & non-woven geotextile
- 0.5 ft drops over j-hook inverts

Log Vanes

- 2-4 % arm slopes
- 20 degree arm angles
- Sealed with woven geotextile & backer logs

Stormwater Outfall Channels (10)

- Vegetated bio-swales (low slope)
- Rock step-pools (high slope)

Construction Practices

- Track equipment
- Spill management plan
- Staged construction phases to limit exposure

Temporary Erosion Control

- Soil prep, seed, straw
- Biodegradable matting (coir, 700g)
- Wood stakes

Vegetation – Streamside Forest

- Native plants
- Grasses, shrubs, trees
- Live stakes, bare roots, containers

Stormwater Wetland Enhancement

- Runoff from 90 acres
- Sediment retention (78% reduction)
- Native plants – nutrient cycling

Education & Engagement

- Signs
- <u>Workshops:</u> Construction, Planting, Maintenance

Maintenance *(Workshop Feb 23, 2012)*

- Planting
- Invasive plant removal
- Bank erosion – brush mattress, coir logs

Natural Succession

Partridge Pea, *Chamaecrista fasciculata*

Is the Project Achieving Goals?

- Streambank erosion eliminated
- Floodplain & wetlands functioning
- Vegetation, water quality, & habitats improving
- Public understanding enhanced

The Value of Demonstration: Shades Creek

Samford University

1,000 ft enhancement

3 workshops

Construction:
January 2011

Shades Creek Enhancement: 2011

Stream Restoration as a BMP

- Sediment control
- Nutrient cycling (instream & floodplain)
- Peak discharge attenuation
- Habitats (aquatic & terrestrial)
- Infrastructure protection

Stream Restoration = Public Enthusiasm

NPS Project Success Matrix

High

Community Support
Land Available
Technically Feasible

Opportunity

Resistance
Severe Constraints
Not Feasible

Low

Low

Need

High

No Impairment

NPS Pollution

Urban Stream Maintenance Workshop
Thursday, February 23, 2012
1pm – 4pm

Shades Creek

Samford Univ Soccer Fields

Little Shades Creek

Western Supermarket, Vestavia Hills

Cahaba River
Clean Water Partnership

Contact:
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Cahaba CWP Facilitator

Email: Littgn@yahoo.com
Phone: (205) 217-2591

RSVP REQUESTED SO THAT WE MAY HAVE AN ESTIMATE OF THOSE PLANNING TO ATTEND