



Mitigation Approaches to Fund Stream Restoration Projects

6th Conference on Natural
Channel Systems

Presentation Outline

- Overview of Mitigation
 - On-Site
 - Banking
 - In-Lieu Fee
- Example In-Lieu Fee Programs
- Other Funding Mechanisms

Overview of Mitigation

- It all Started with the Clean Water Act
- 2008 Final Compensatory Mitigation Rule
- Forms of Mitigation
 - On-Site
 - Mitigation Banks
 - In Lieu Fee Programs
- All Forms Offer Viable Mitigation



On Site Mitigation

- Direct Mitigation for Project Impact
- Simplified Permitting Process
- Can be a Piece-Meal Approach
- Cost Considerations





Middle Fork Beargrass Creek Restoration Project





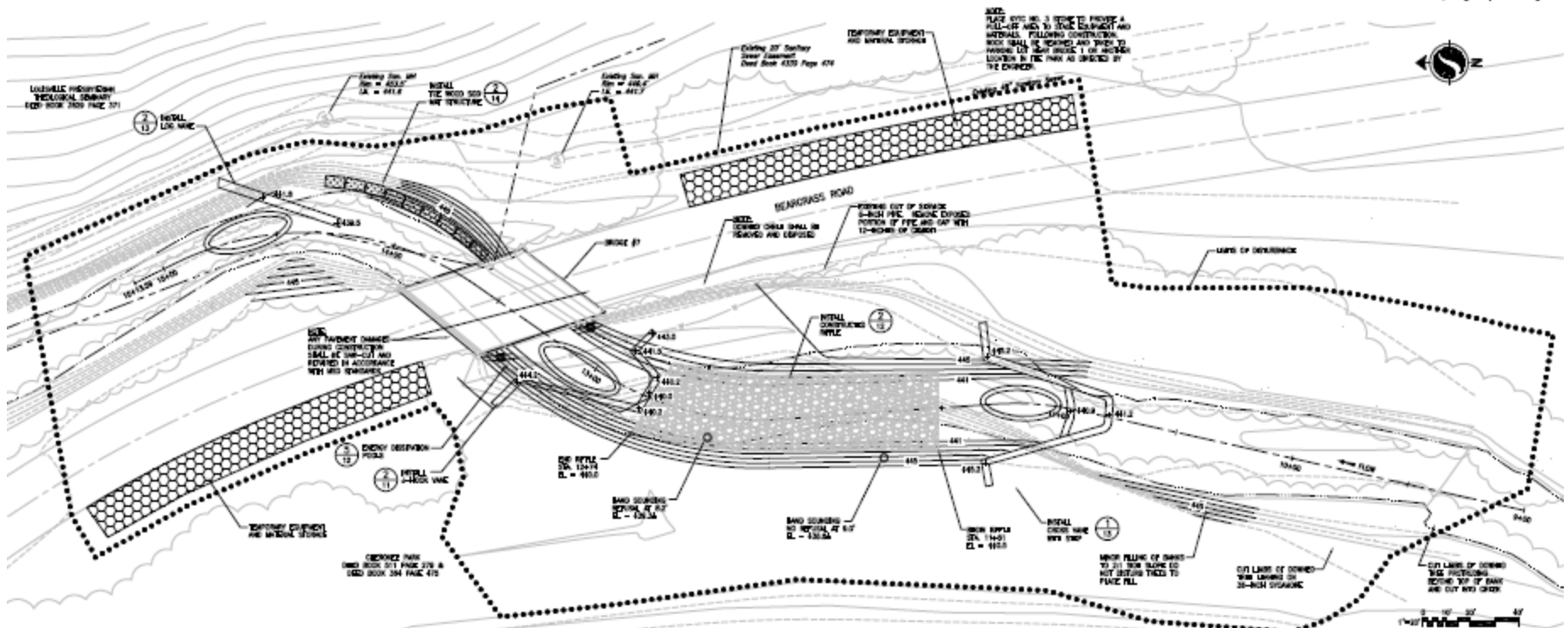
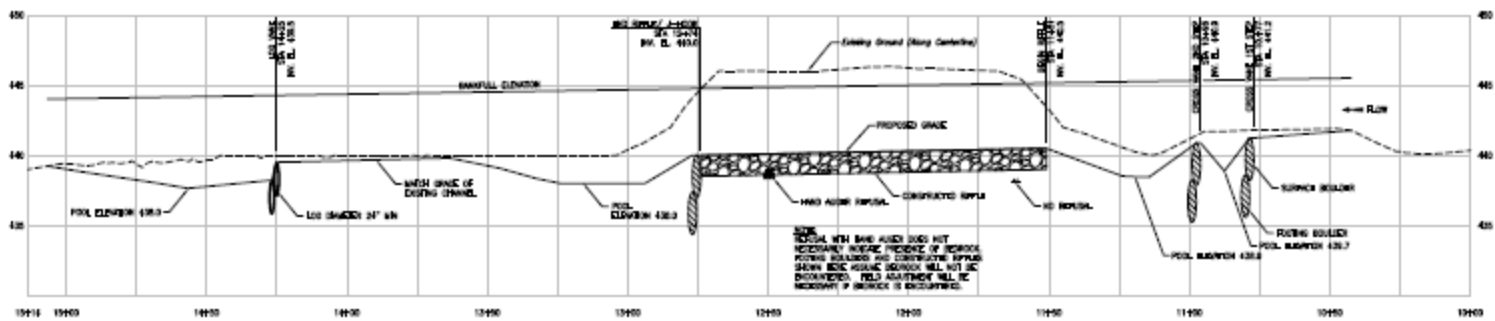
Design Objectives

- Minimize Erosion
- Restore Habitat
- Create a Better Flow Path through the Bridge
- Improve Riparian Corridor

Design Process

- Review of Watershed
- Overview of Site (Toothpick Survey)
- Gage Analysis/Region Geomorphic Relationships
- Geomorphic Data Collection
 - Cross Sections
 - Longitudinal Profile
 - Pebble Counts
 - Bar Samples
- Sediment Transport Analysis





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Mitigation Banking

- Form of Compensatory Mitigation
- Requires Upfront Investment
- Once Approved Owner Sells Credits
- Credits Approved for Sale Based on Release Schedule
- Private Investment



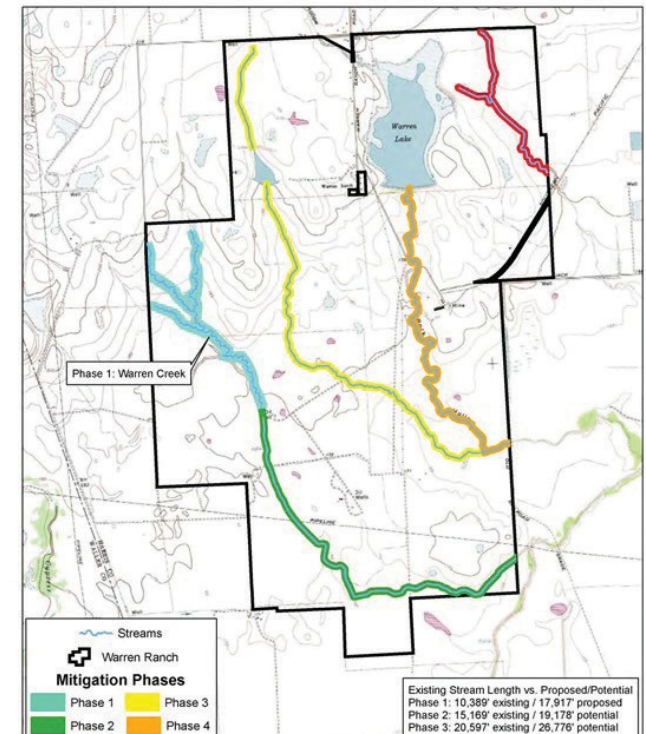
Katy Prairie Stream Mitigation Bank

Key Issues

- Project permitted on fast track bases to secure funding
- 80,000 feet of impairments
- Sand bed system

Solutions

- Designed completed in 3 months
- Significant use of wood structures
- Services included:
 - Design
 - Construction observation
 - As-built survey/monitoring





In Lieu Fee

- Form of Compensatory Mitigation
- Provides Means to Pool Mitigation Dollars
- Allows for Larger More Comprehensive Restoration Projects
- Typically Paid at a Set Rate Per Unit of Impact

North Carolina In Lieu Fee

- First Initiate in 1997
- Administered by NC DMS (formerly NCEEP)
- Annual Income Approx. \$23M
- Fees Per Unit
 - Urban - \$374
 - Rural - \$283
- Initially Followed Design/Bid/Build
- Currently Follows Full Delivery Format



North Carolina In Lieu Fee

- Have Implemented Over 500 Projects
- 630+ Miles of Streams
- 30,000 Acres of Wetlands
- 680 Acres of Buffers
- Average Length of Project – Approx. 10,000 feet



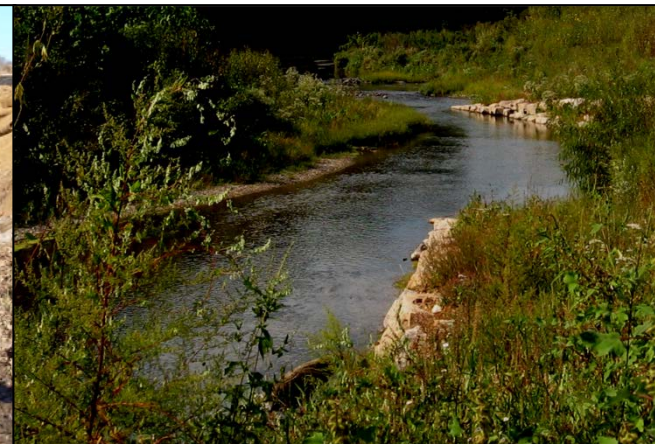
Tennessee In Lieu Fee

- First Initiate in 2003
- Administered by TSMP
- Annual Income Approx. \$5.5M
- Fees Per Unit - \$200
- Stream Mitigation Only – No Wetlands
- Follows a Hybrid Design/Build Format



Hybrid Design/Build Format

- TSMP Selects On-Call Designer
- TSMP & On-Call Designer Selects Contractor
- Present Project to IRT
- If Approved, TSMP Contracts with Designer
- Designer Completes the Design with Input from Contractor
- Contractor Develops Final Cost Based on 100% Design



Tennessee In Lieu Fee

- Have Implemented Over 30 Projects
- 45+ Miles of Streams
- Average Length of Project – Approx. 8,800 Feet



Kentucky In Lieu Fee

- First Initiate in 2000
- Administered by Kentucky Department of Fish & Wildlife
- Annual Income Approx. \$12M
- Fees Per Unit
 - Eastern KY - \$650
 - All Other Areas - \$240
 - Initial Fee - \$125 for all Areas
- Follows a Design/Bid/Build and Design/Build Format



Kentucky In Lieu Fee

- Have Implemented 59 Projects Thru 2012
- 110+ Miles of Streams
- Average Length of Project – Approx. 13,500 feet
- 45 Acres of Wetlands





In Lieu Fee Case Study: Kyles Ford Stream Restoration



An aerial satellite photograph showing a large, dark, winding river bend. The river flows from the bottom left towards the top right. A smaller, narrower creek joins the river from the top right, forming a sharp bend. The surrounding landscape is a mix of green fields, brownish soil, and some buildings. Two white arrows point from text labels to the respective water bodies.

Wallen's Bend
Creek

Clinch River

Project Overview

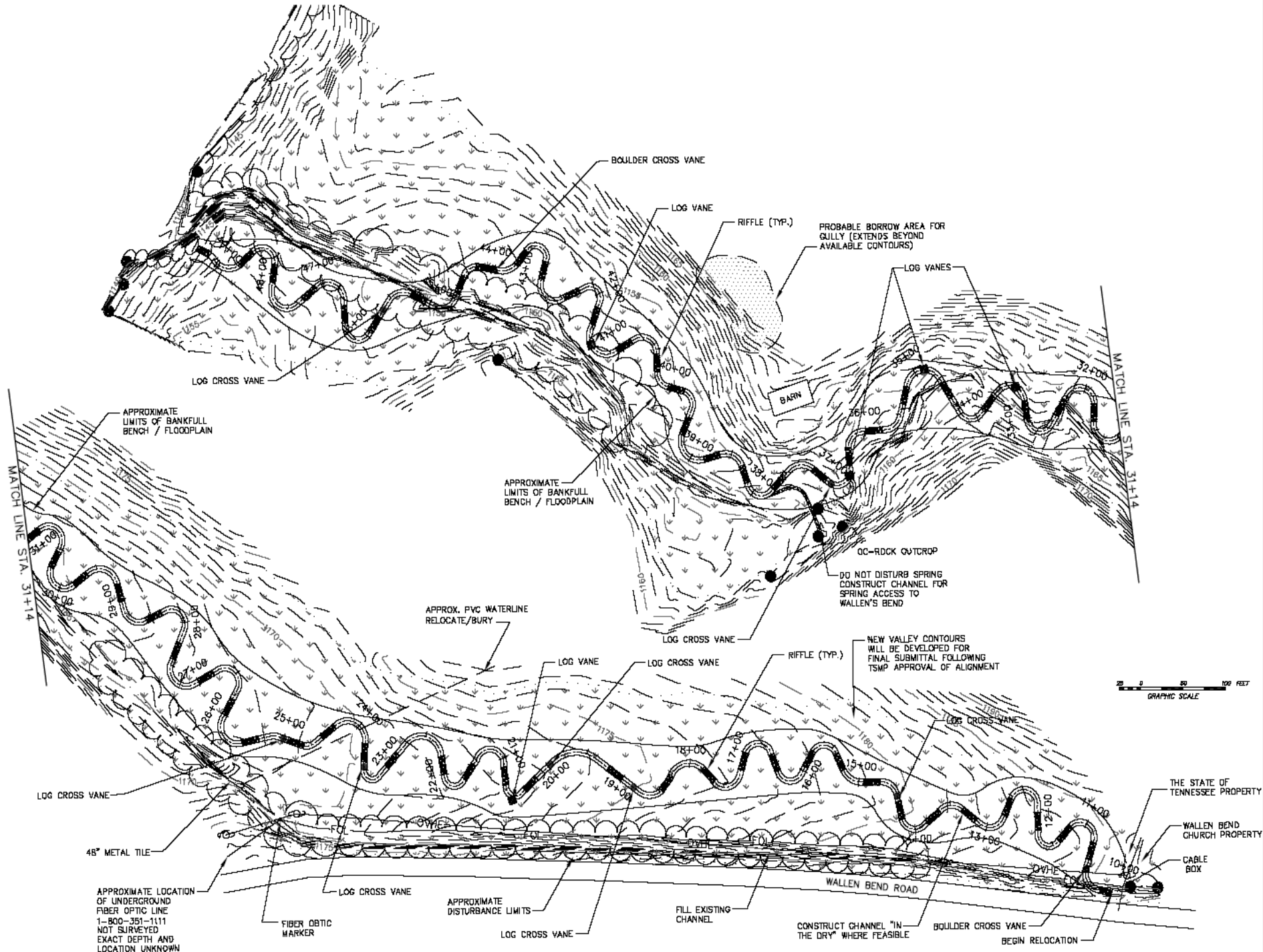
- TSMP Project
- Restored 4,000 feet of Wallen's Bend
- Restored Severely Eroding Streambank along Clinch River
- Diverse Mussel Shoal w/ Numerous Endangered Species



Clinch River

Mid-Channel Bar















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An aerial photograph showing a stream restoration project. The stream is a narrow, winding channel of water, surrounded by a mix of green and yellowish vegetation, indicating a natural or semi-natural environment. The surrounding area is densely forested with trees, and there are some open fields and a small pond visible in the background.

Mitigation Based Funding for Stream Restoration

- All Forms of Mitigation Can be Viable
- Kyles Ford Example
- Timing Considerations
- Crediting Process Needs to Work for All Forms of Mitigation
- Credits for Dam Removals

Key Considerations for In Lieu Fee Programs

- Consistent with 2008 Final Mitigation Rule
- Appropriate \$ Per Mitigation Unit
- Credit (Mitigation Unit) Determinations
- Economy of Scale
- Contracting & Procurement Process

Other Funding Mechanisms

- Water Quality Initiatives – TMDL – Sediment Reduction
- Resiliency Focused Restoration
- Nutrient Offset Trading
- Water Quality Policy Similar to Detention Policy
- Focus on Minimizing Geomorphic Disturbance with Development

Elm Fork Stream Restoration Project



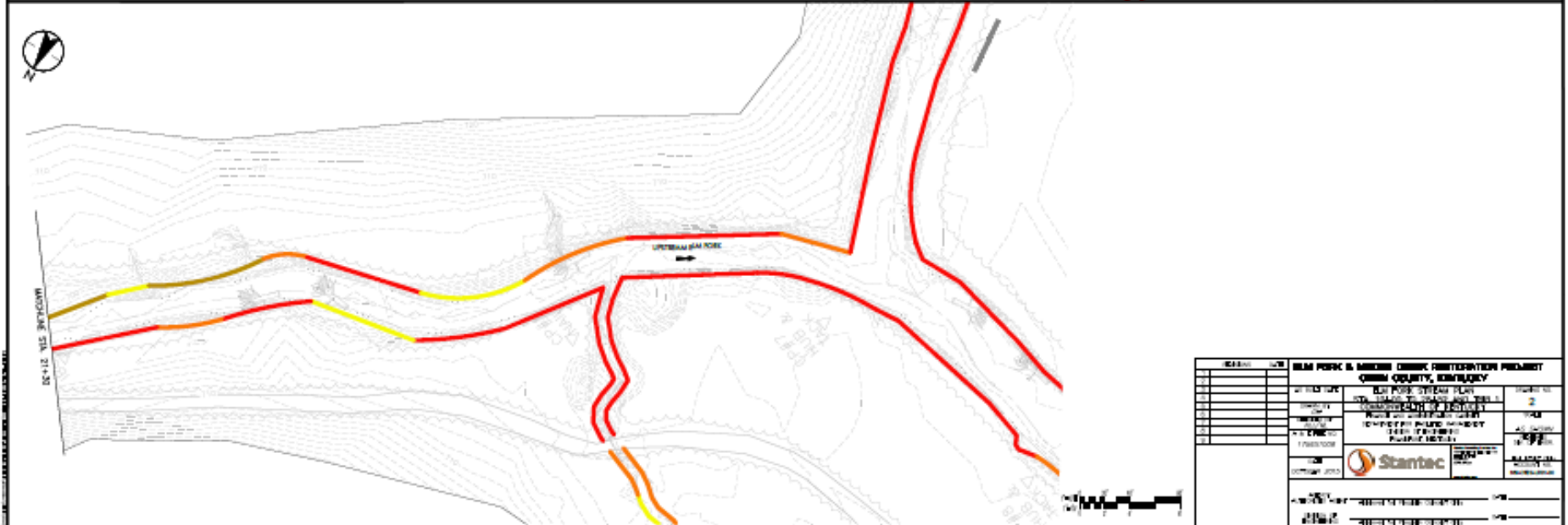


Elm Fork Stream Restoration

- Entrenched stream
- Minimal riffle habitat
- Significant erosion
- Raised channel bed
- Increased riffle/pool habitat
- Project encompasses 8,500 feet of restoration



Pre Restoration BANCS Model

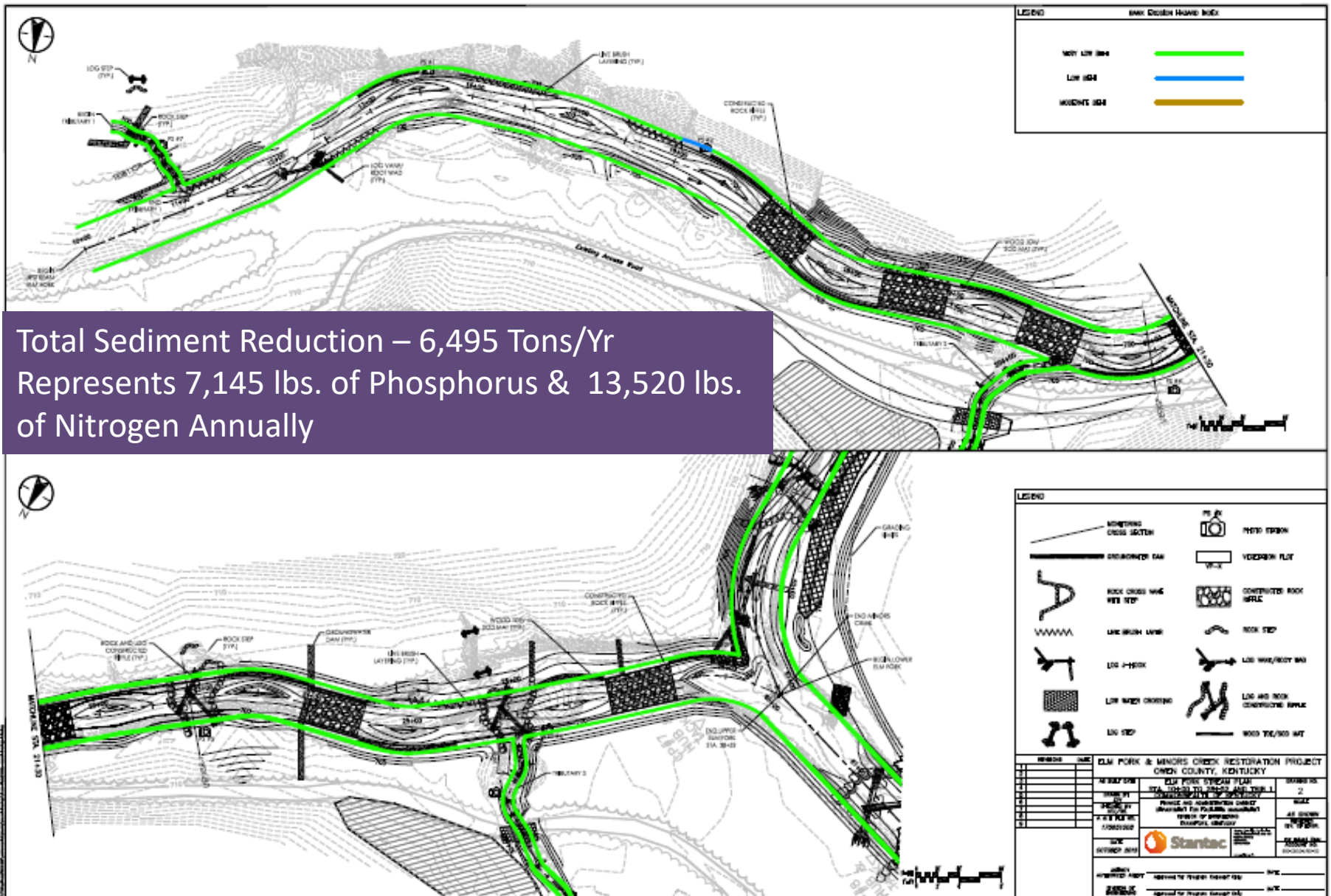


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Pre Restoration BANCS Model





After 2 Growing Season



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