

The Kentucky Stream and Wetland Umbrella Mitigation Bank

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Kentucky
Stream Mitigation Banks



**Ecosystem
Investment
Partners**



Beaver Creek Hydrology

Presentation Overview

- The Kentucky Stream and Wetland Umbrella Mitigation Bank (KSWUMB)
 - The Sponsor/Team
 - Need for banks in Kentucky
 - Watershed impacts
 - Restoration approach
 - Site selection
 - Permitting/Design/Construction/Monitoring
 - Economic impacts

Project Partners

- Sponsor: Ecosystem Investment Partners
 - Private Equity Group - Baltimore, MD
- Designer: Beaver Creek Hydrology
 - Specializing in Stream and Wetland Restoration Design
- Contractor: Stream Restoration Specialists
- Regulatory Review: USACE and IRT



Beaver Creek Hydrology



What is Compensatory Mitigation?

- Restoration, enhancement, preservation of streams and wetlands to offset unavoidable impacts to WOTUS
- Section 404 of the Clean Water Act.
- Regulated under the 2008 mitigation rule (33 CFR Parts 325 and 332; 40 CFR Part 230)
- Credit hierarchy - Mitigation Banking



Mitigation Needs in Kentucky

- In-Lieu Fee has dominated mitigation in KY
 - Over \$160 million collected in past 15 years
 - Two main programs (KDFWR and NKU)
- Very few private banks – mostly wetlands
- Existing banks didn't service a large part of KY

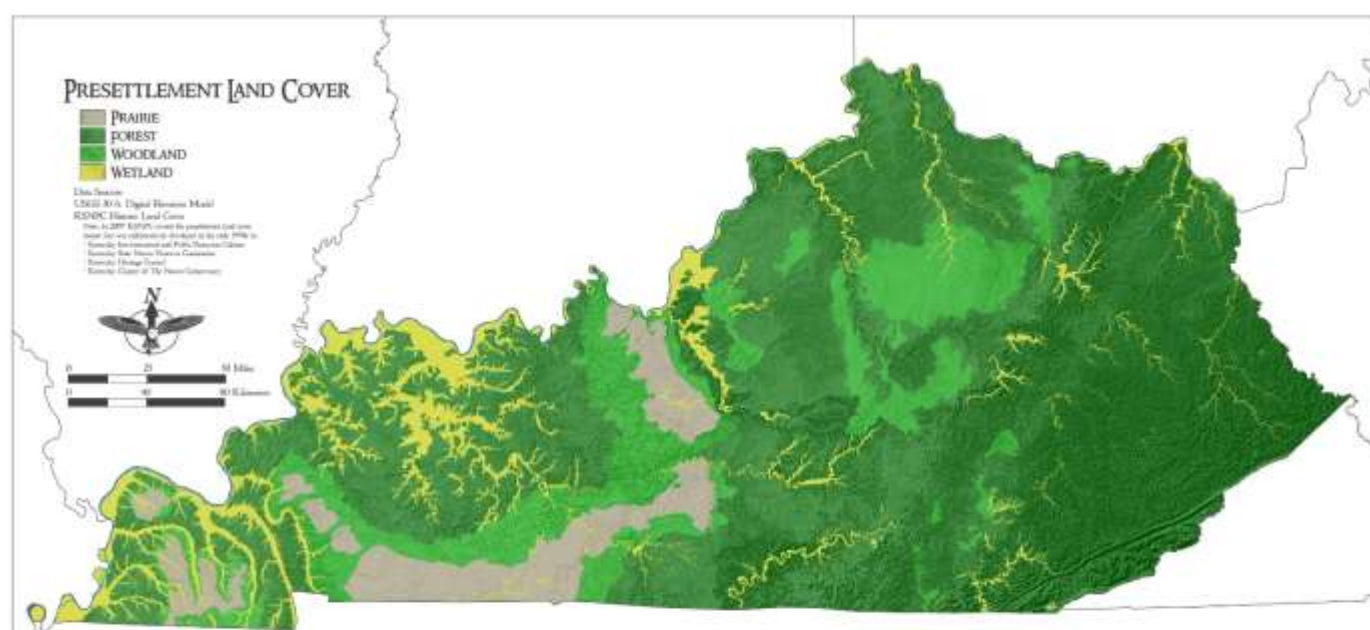


Impacts in Kentucky

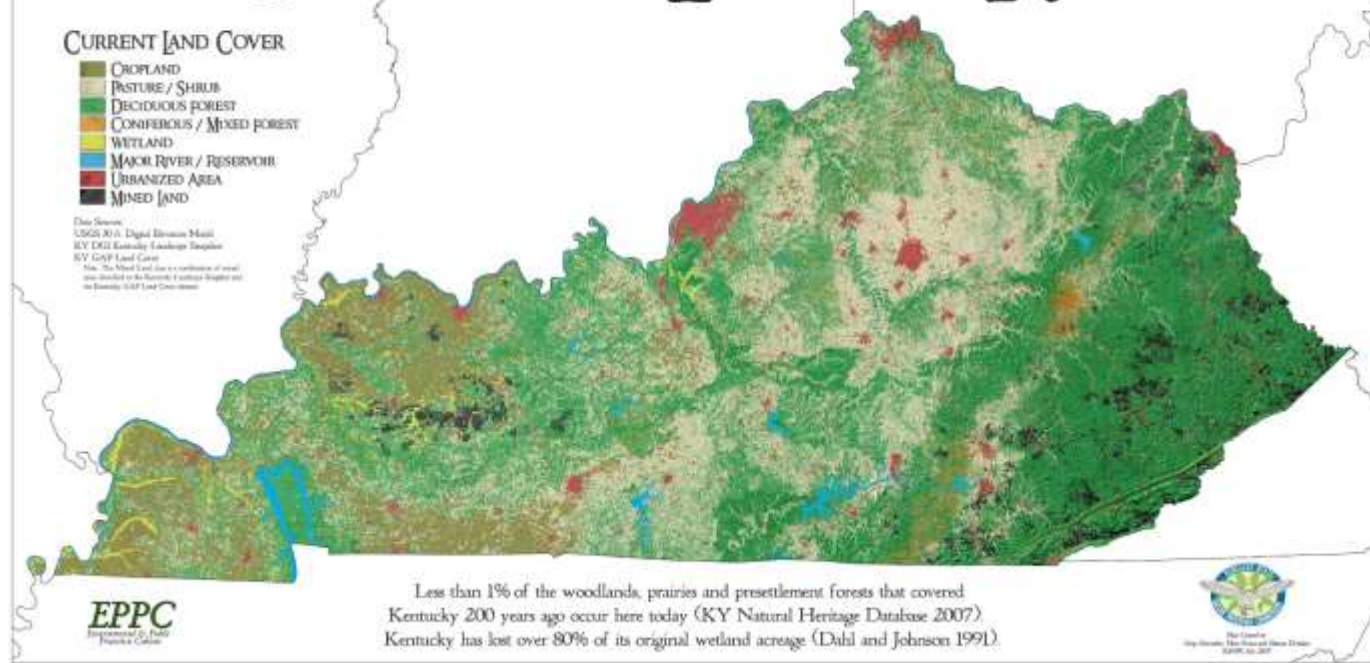
More miles of US waters than any other state except Alaska.

> 90,000 miles of streams

13 major river basins



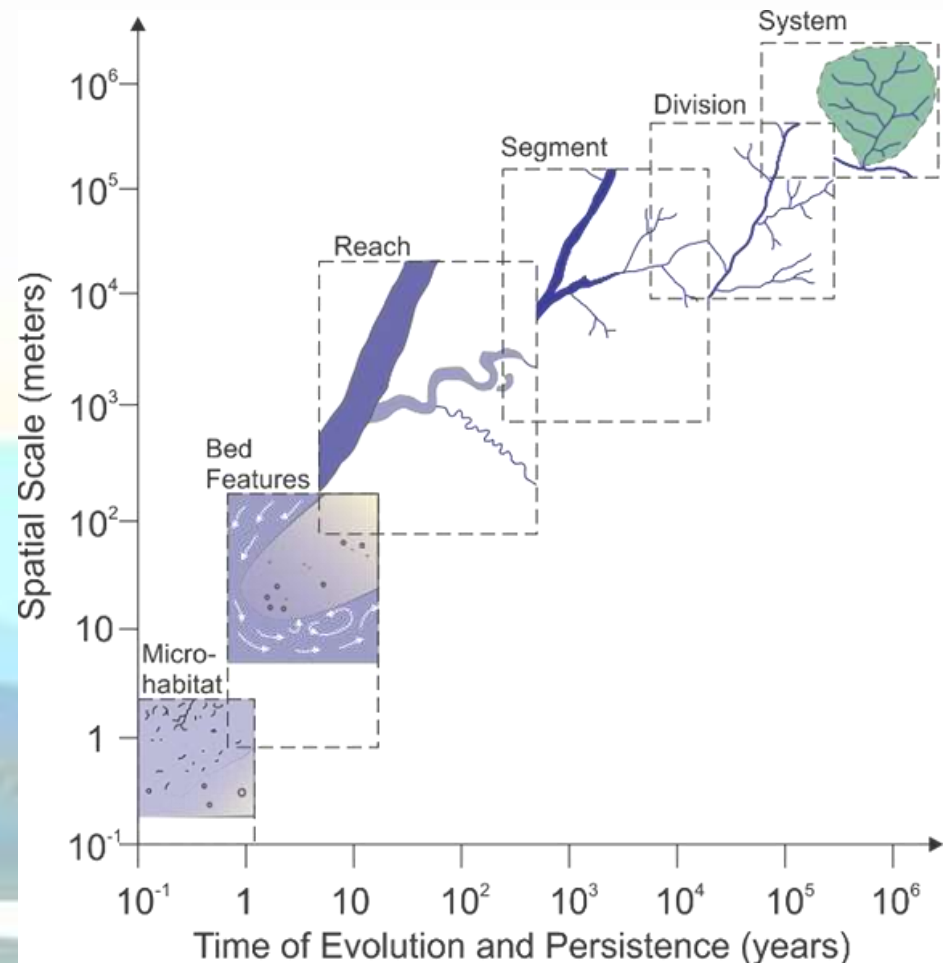
KENTUCKY THEN & NOW





Restoration Approach

- Watershed scale
- Lower risk
- Minimizes impacts from off-site
- Full restoration
 - Priority One approach
 - No expense spared
 - Full riparian buffer established



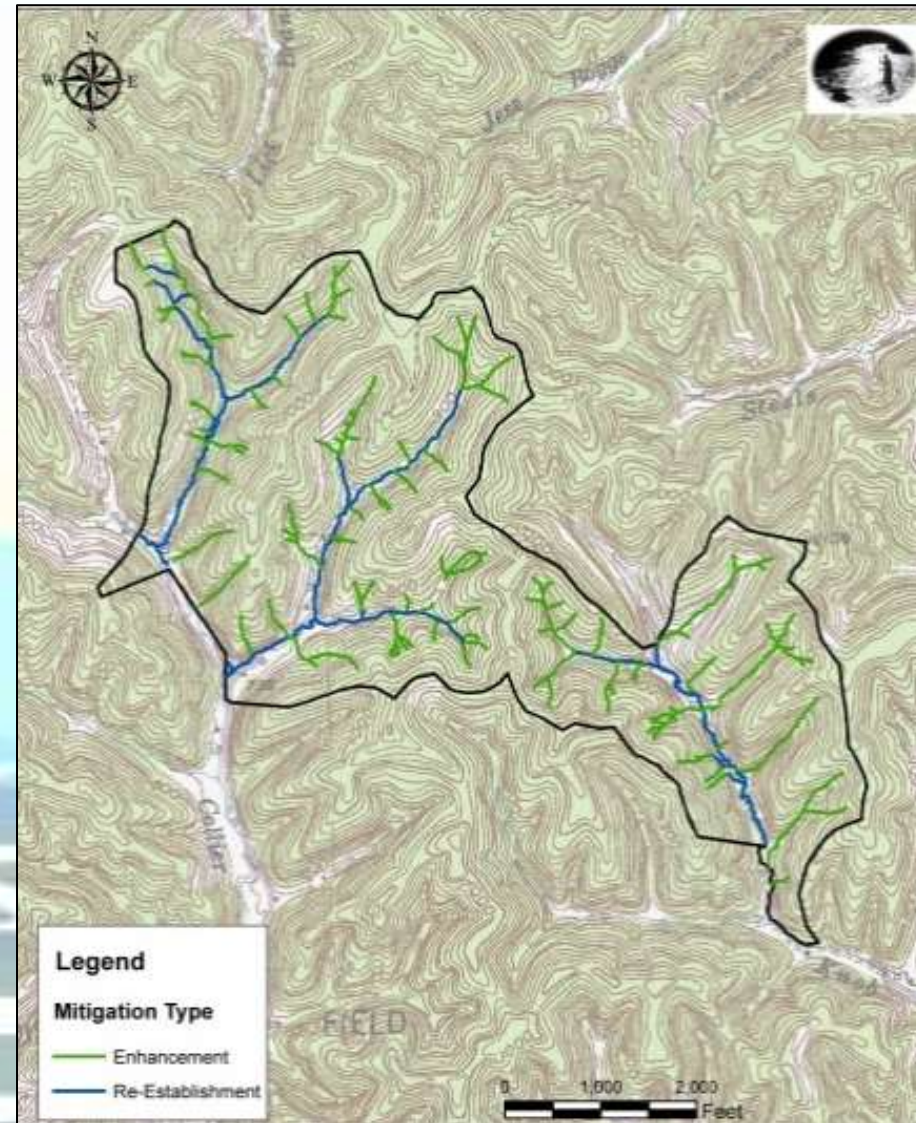
KSWUMB – Sites

- Currently 5 Sites permitted
- 4 Sites constructed
- 1 Site under construction
- 3 Additional Sites in the permitting process
- 265,000+ linear feet (50 miles) of streams constructed
- 650,000+ woody stems planted
- 1,500 acres of land under Site Protection Instruments
- Streams meeting performance criteria



Sites – Big Sandy Mitigation Bank

- USACE ID: LRL-2012-606
- 69,852 linear feet of restoration
- 32,958 EIU credits generated
- 232,000 woody stems planted
- Final as-built in 2016

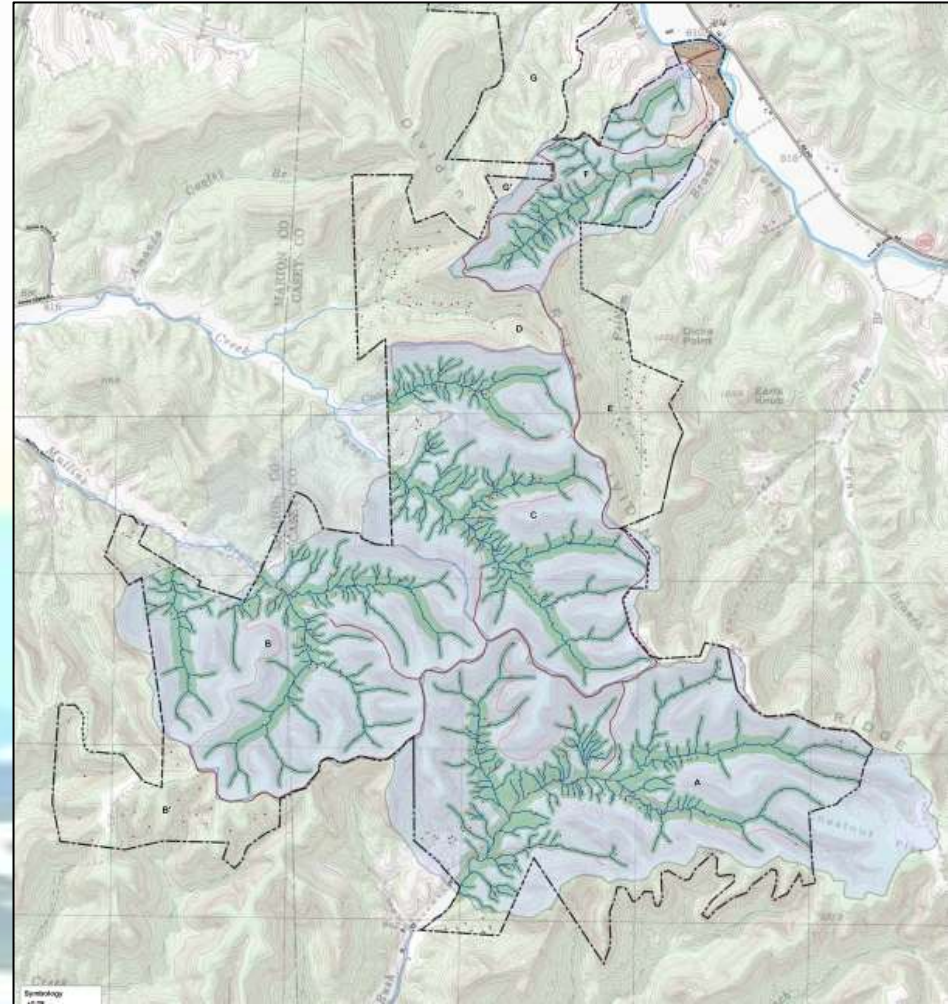


Big sandy 2016 - 2020



Sites – Rolling Fork Mitigation Bank

- USACE ID: LRL-2014-374
- 64,532 linear feet of restoration
- 44,183 AMU credits generated
- 101,300 woody stems planted
- Final as-built in 2017

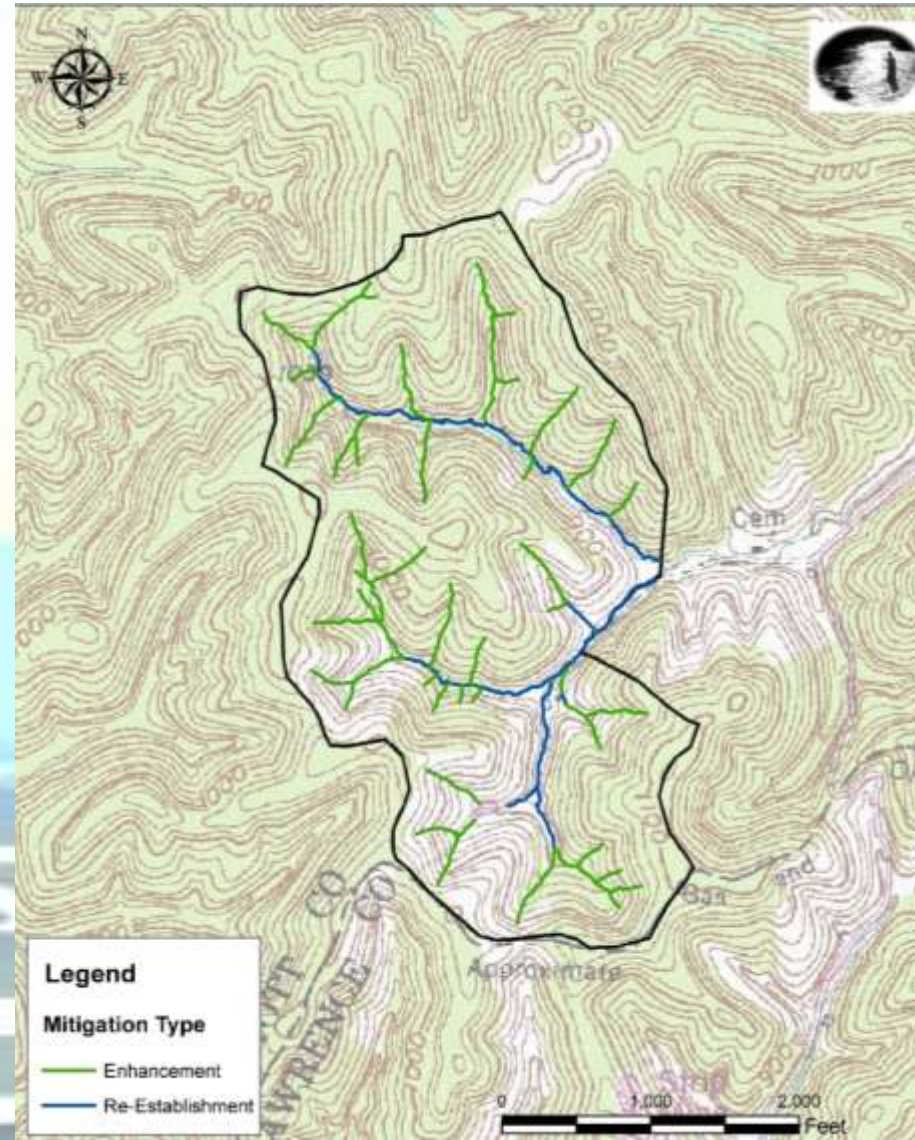


Rolling Fork 2017 - 2021

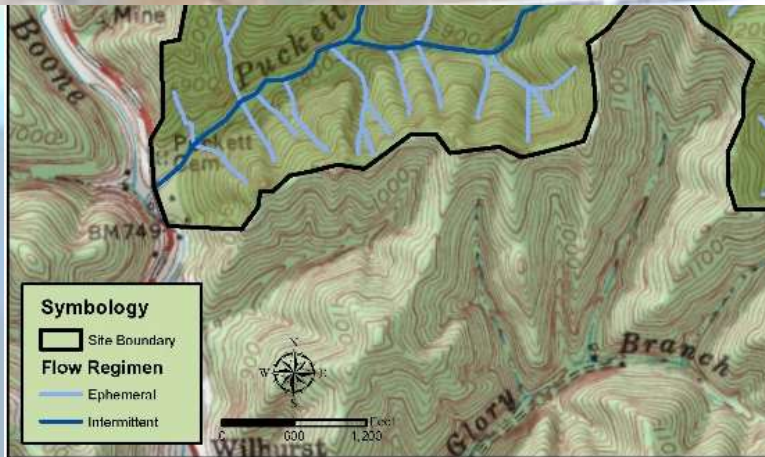


Sites – Little Sandy Mitigation Bank

- USACE ID: LRL-2012-607
- 25,005 linear feet of restoration
- 11,500 EIU credits generated
- 89,420 woody stems planted
- Final as-built in 2016



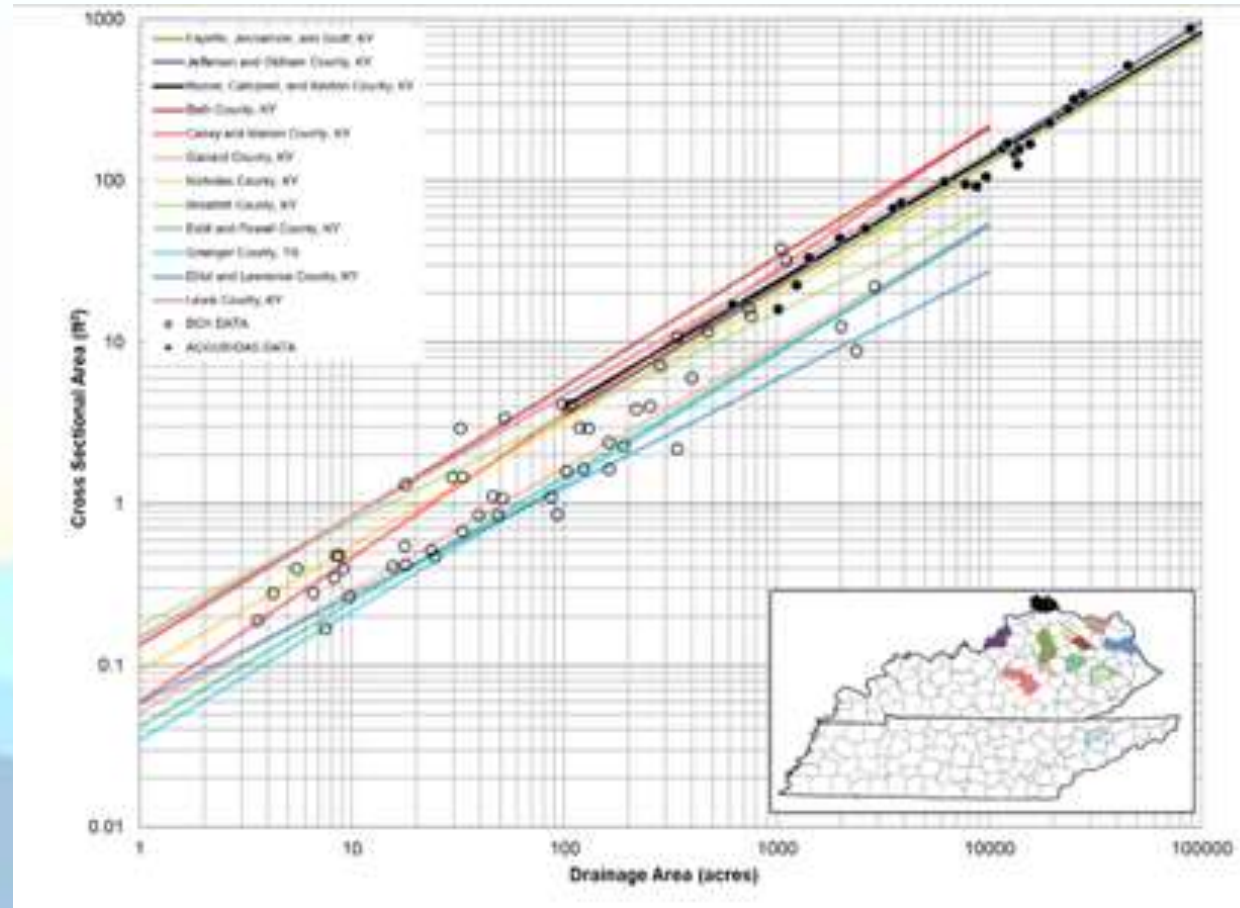
Sites – North Fork Mitigation Bank



- USACE ID: LRL-2015-322
- 107,540 linear feet of restoration
- 49,498 EIU credits generated
- 236,347 woody stems planted
- Final as-built in 2018

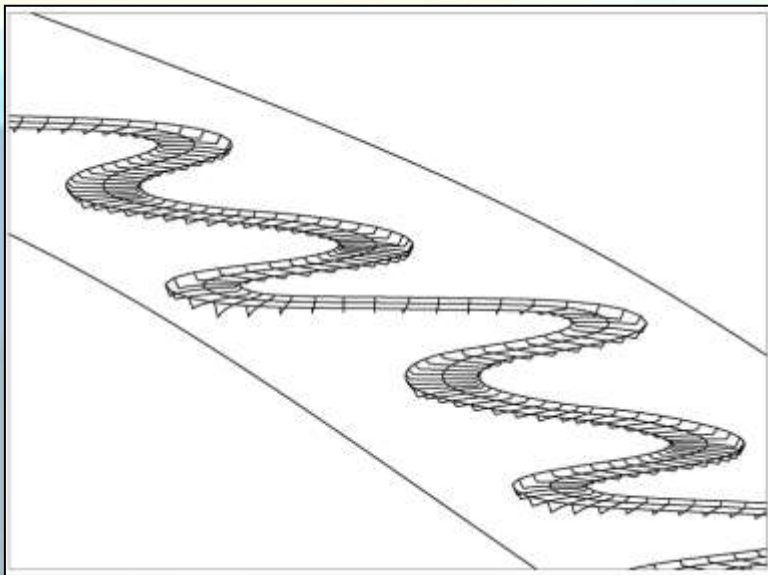
Design

- Natural Channel Design approach
- Regional Curve developed for channel cross section
- Priority One approach for majority of the reaches



The BANKFULL Mathematical Model

- BANKFULL © Software
 - Utilizes Bezier curve flow paths
 - Utilizes the Meander Flow Equations (1986)
 - Predicts alignment, depths and 2D velocity
 - Mathematical model of the effective flow region
 - Used for designing stream restoration projects

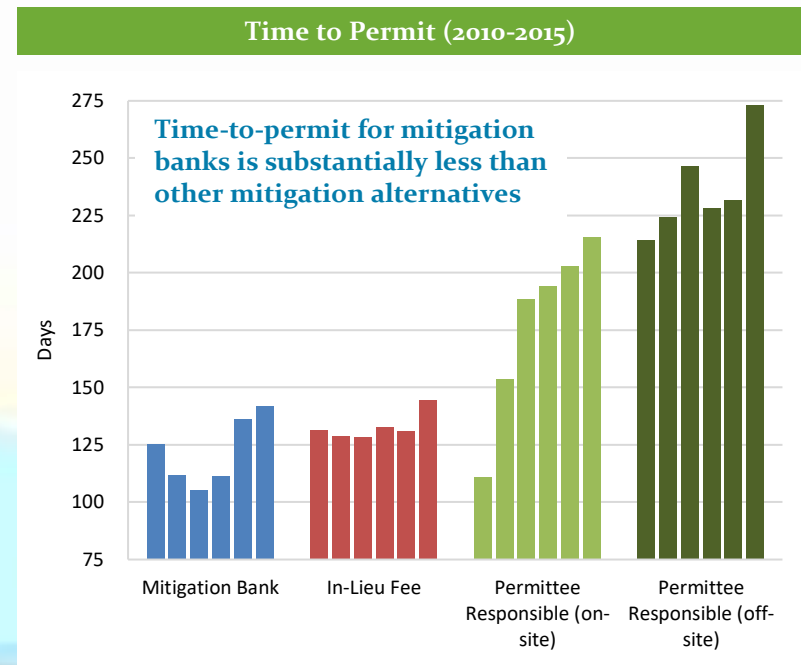


Positive Economic Impact

- 15 Professional Jobs – Engineers, Project Managers, Ecologists, Surveyors, Attorneys, Administration Staff
- 100+ Construction Jobs
 - Equipment Operators (former Coal Miners)
 - Hand Laborers
 - Revegetation Specialists
 - Truck Drivers
 - Mechanics
- Local Economy
 - Hotels
 - Food
 - Fuel
- Permit time reduced for clients

Positive Economic Impact

- These mitigation banks have facilitated the permitting of over 38 unique projects across Kentucky
- Over 68,000 credits transacted to date



Valuable Lessons

- Land Control is critical (no other landowner input)
- Flow testing during construction provides for much better product
- Watershed Approach
- Floods will happen during construction



Questions

