



Reedy Creek Stream Restoration

Applying Design-Build Methodologies for Stream Restoration in a Headwater Watershed

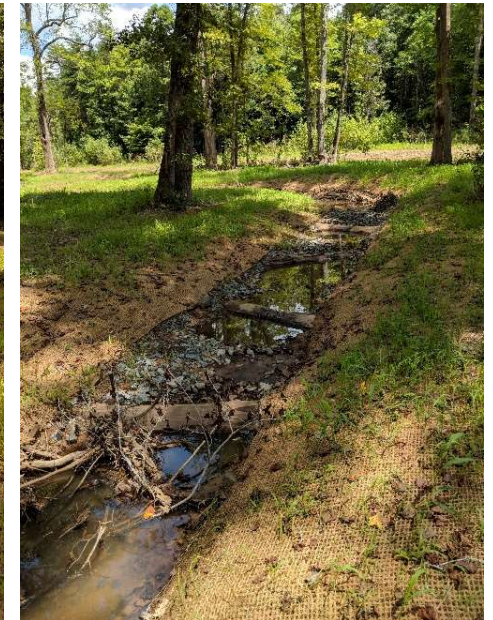
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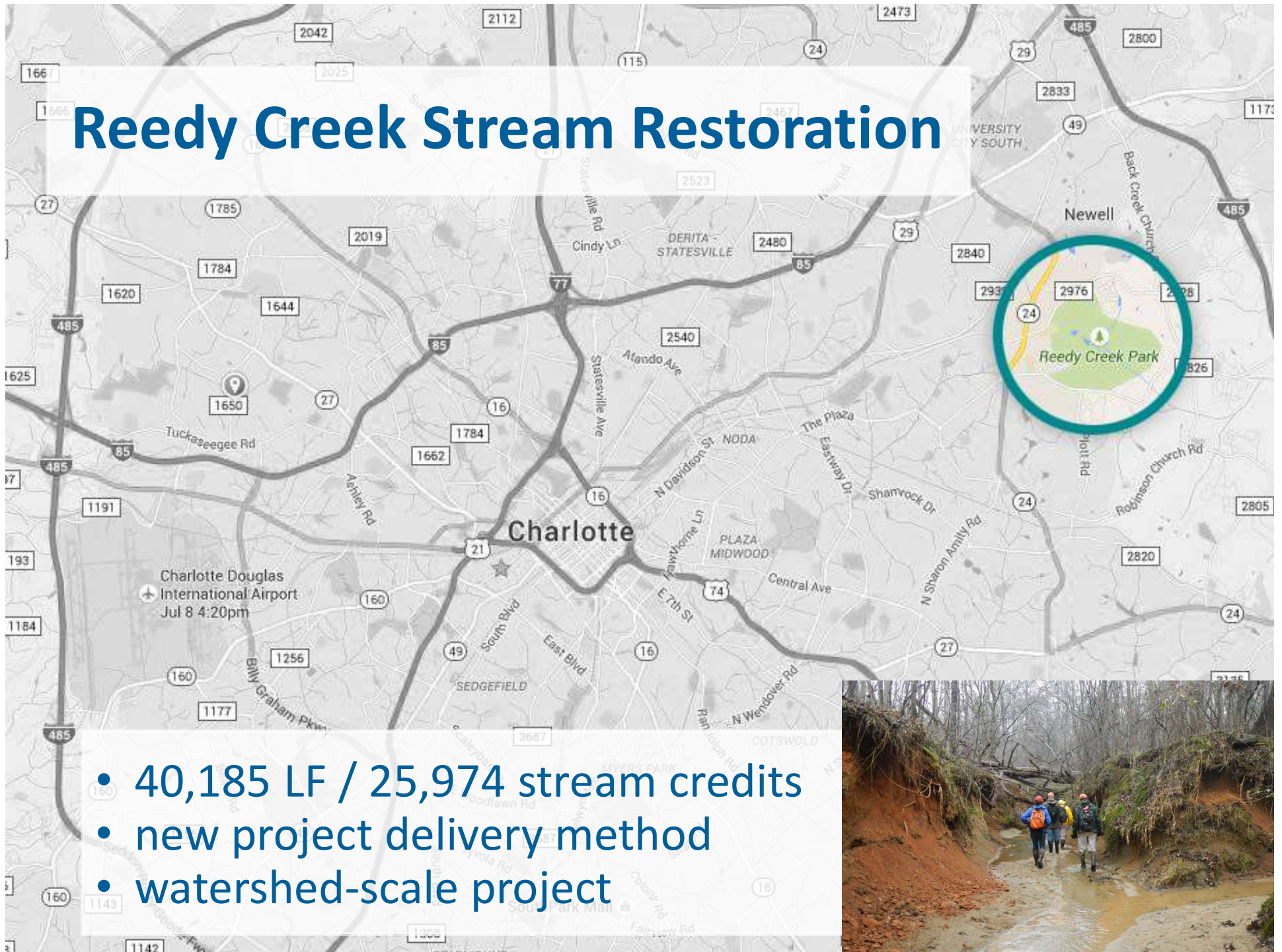


Presentation Overview

- Progressive Design-Build (D-B) framework
- Design considerations
- Construction phase



Reedy Creek Stream Restoration



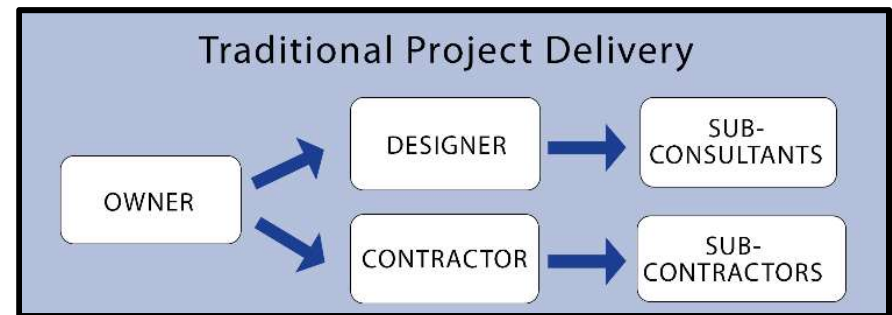
- 40,185 LF / 25,974 stream credits
- new project delivery method
- watershed-scale project





Design-Bid-Build

Method of project delivery in which the project owner contracts separately with the designer and the contractor to provide design and construction services



Design-Build

Method of project delivery in which one entity works under a single contract with the project owner to provide design and construction services



Progressive Design-Build



Contract Challenges

- **Evaluating** technical proposals
- Defining **success criteria** for project
- Limiting the **City's role** in design
- Managing **real estate acquisition**
- Setting up the **design-build contract**
- Incorporating the **monitoring period**



Stream Project Challenges

- With conventional low-bid projects, **engineers and contractors can be at odds** e.g., field adjustments
- Owner takes the risk of ensuring **stream monitoring success** after construction
- Owner's internal processes can **delay** project schedules
- Owner and Contractor may lack the **expertise** for these types of projects



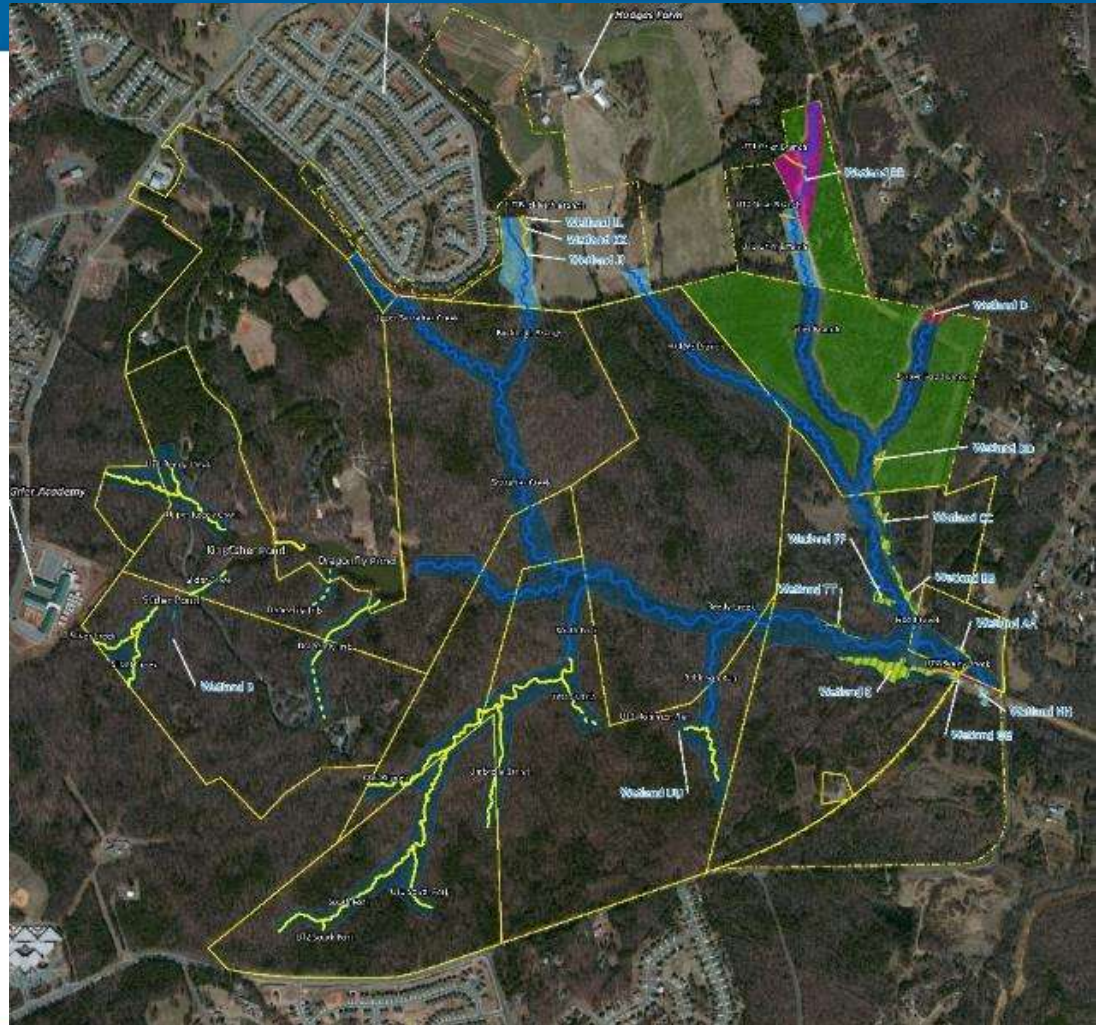


D-B Benefits

- **Reduce Owner's risk:** Single source of accountability
- **Expedite project schedule** by reducing design/review/bid phase time
- More closely align projects with how the **private industry** is completing 'full delivery' projects
- Offer ability to keep up with **emerging stream restoration science**
- Allow for **value engineering**

Easement corridor optimized concurrently with design

- 13 publicly owned parcels
- 5 privately owned parcels
- 157 acres of conservation easement
- Headcut tie-ins as needed for Priority 1 design
- Do not procure more easement than necessary

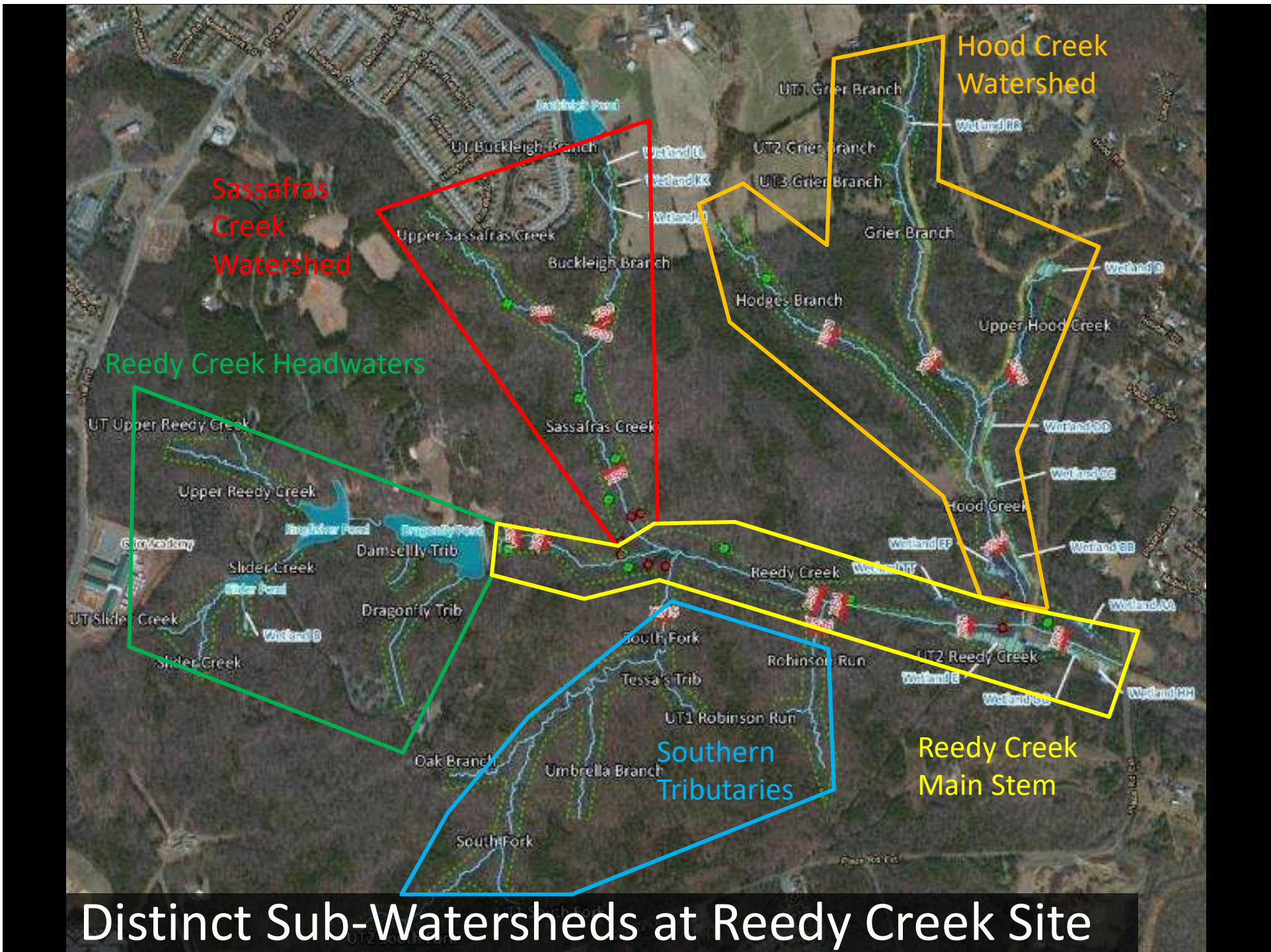


D-B Lessons Learned Thus Far

- Work was needed to **tailor the D-B approach** to a stream restoration project
- **Owner's representative** can help to expedite project delivery
- Clarify **selection and scoring process** for technical proposals
- Establishment of quantifiable **success criteria** is critical to the success of the project
- **Progressive D-B** allows for better communication, project financial transparency, and collaborative input
- Initial contract creation was slow but **design and construction has been faster than typical City project**
- Contract mechanism now in place for **future use**

Ever heard the phrase, "It's like herding cats?!?"





Distinct Sub-Watersheds at Reedy Creek Site

Distinct Valley Types

Led to design of

- Meandering channels
- Step pool channels



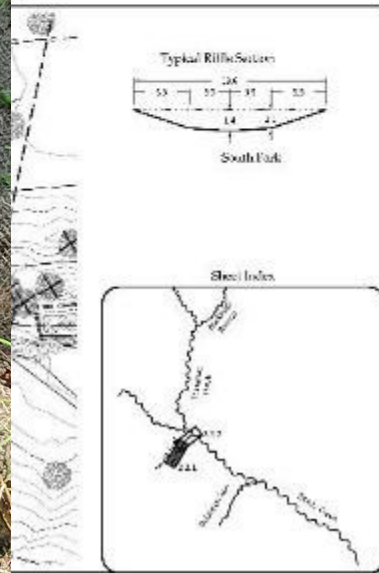
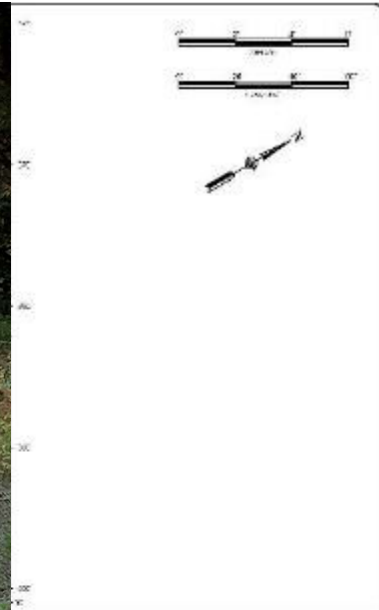
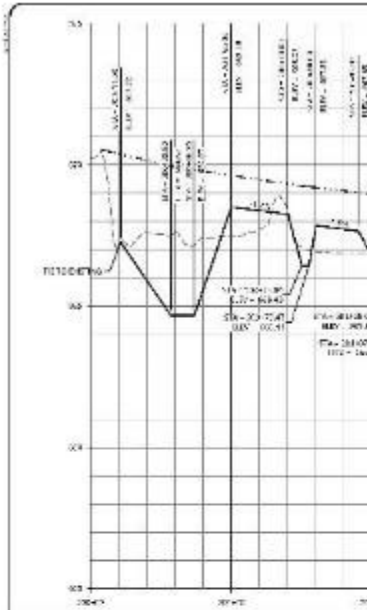


Meandering Channels





Step Pool Channels



REEDY CREEK
stream restoration

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FOR DESIGN AND CONSTRUCTION

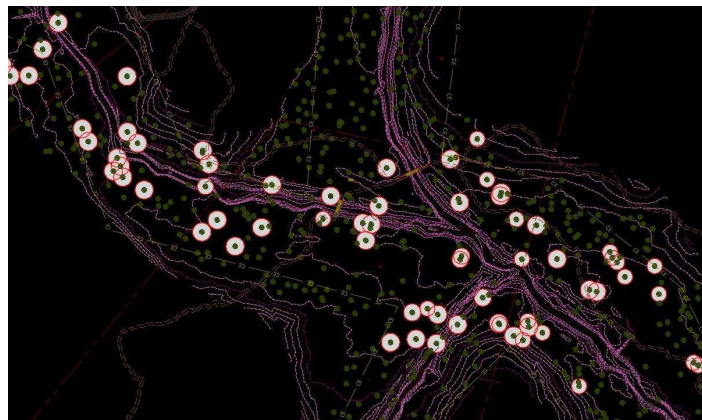
Reedy Creek Stream Restoration
Charlotte, North Carolina

South Fork Reedy I
Stream Plan and Profile

DATE: 04/21/14
PROJECT: 14-001
SHEET: 2.2.1

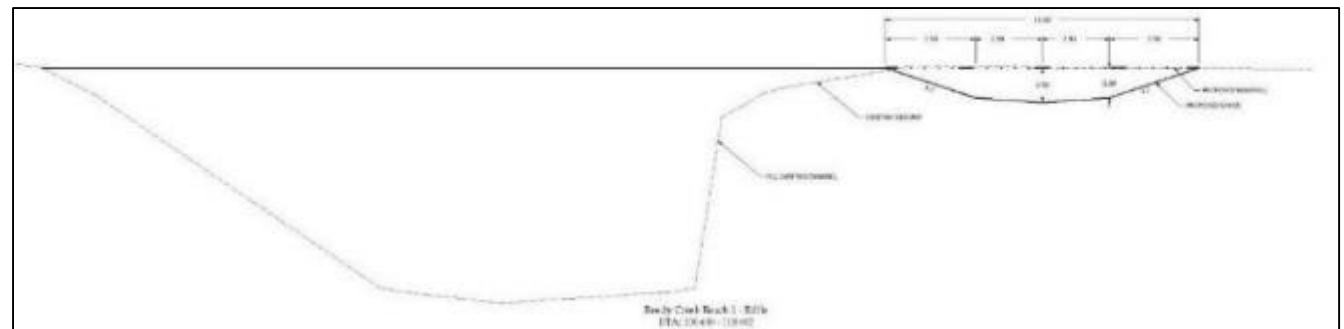
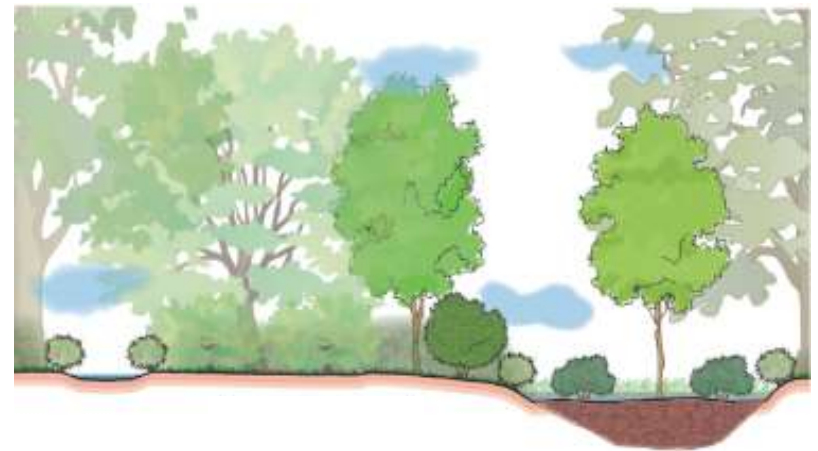
Design Constraints

- Park Infrastructure
- Utilities, Old Landfill, Roads
- Historical Structures
- Big Trees



Priority 1 Earthwork

- + most holistic restoration
- + save more trees
- need a lot of dirt
- increase floodplain flows (CLOMR)





Construction Phase



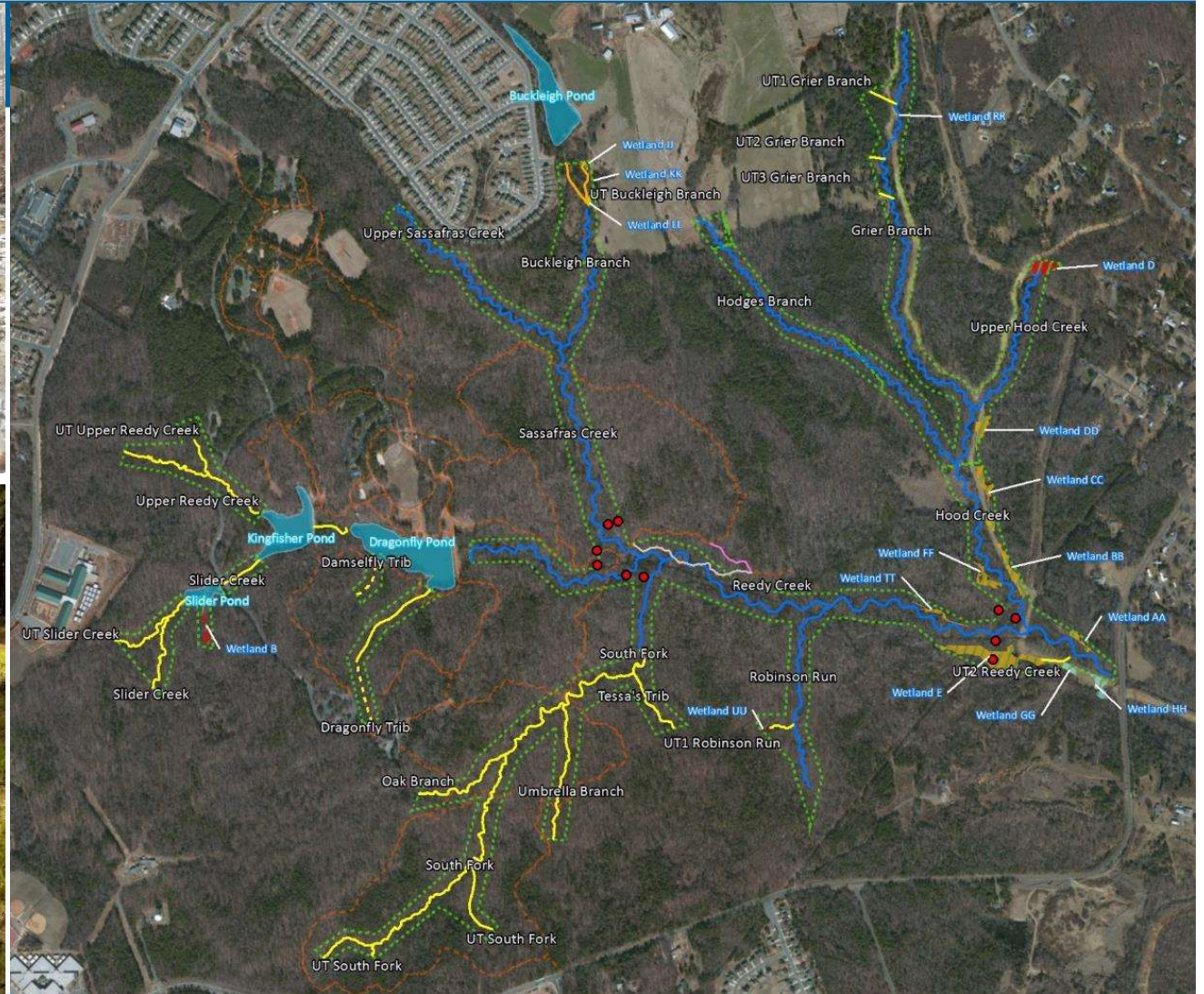
D-B adjustments

- Materials: rock, logs
- Soil conditions





Construction Phase





Construction Phase



BUCKLEIGH BRANCH

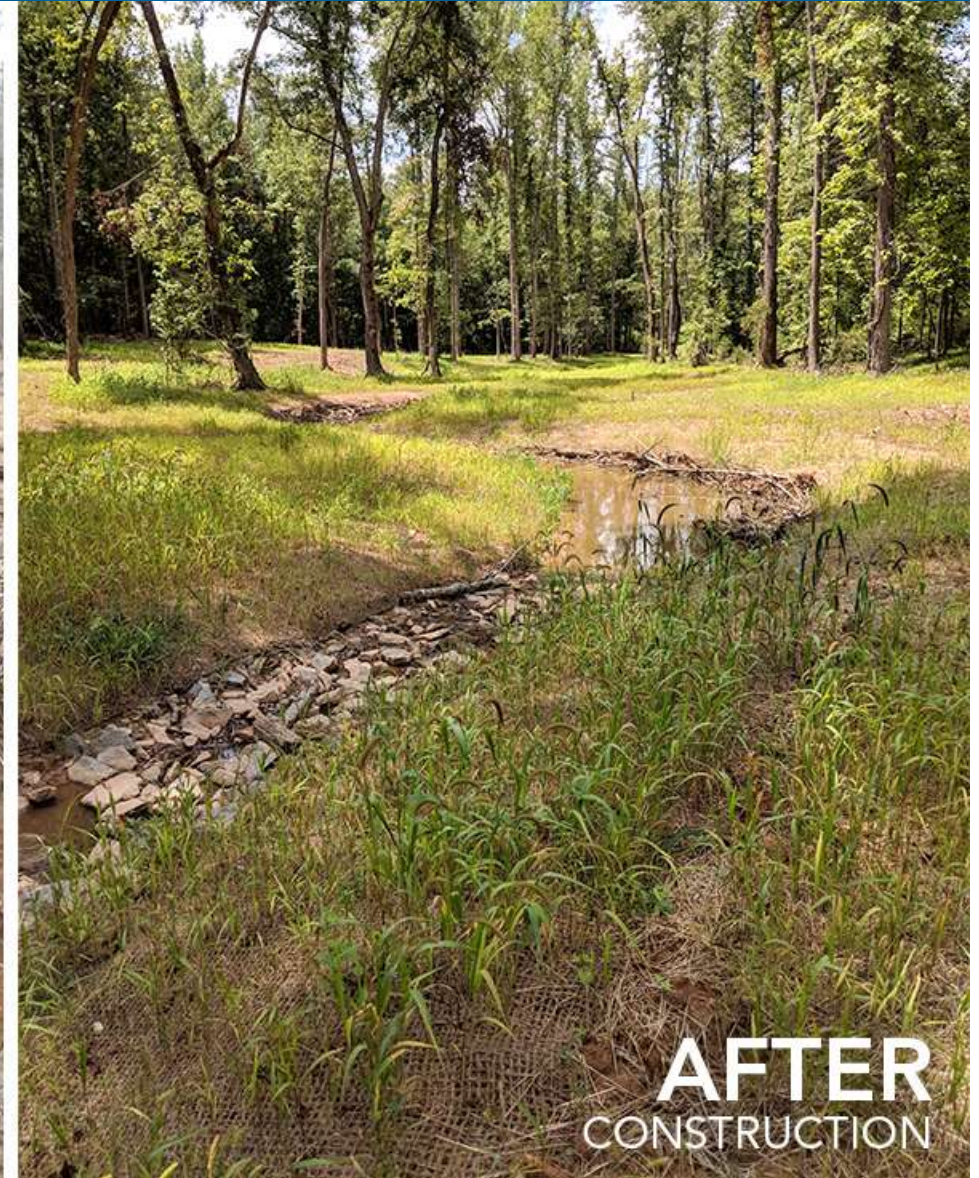
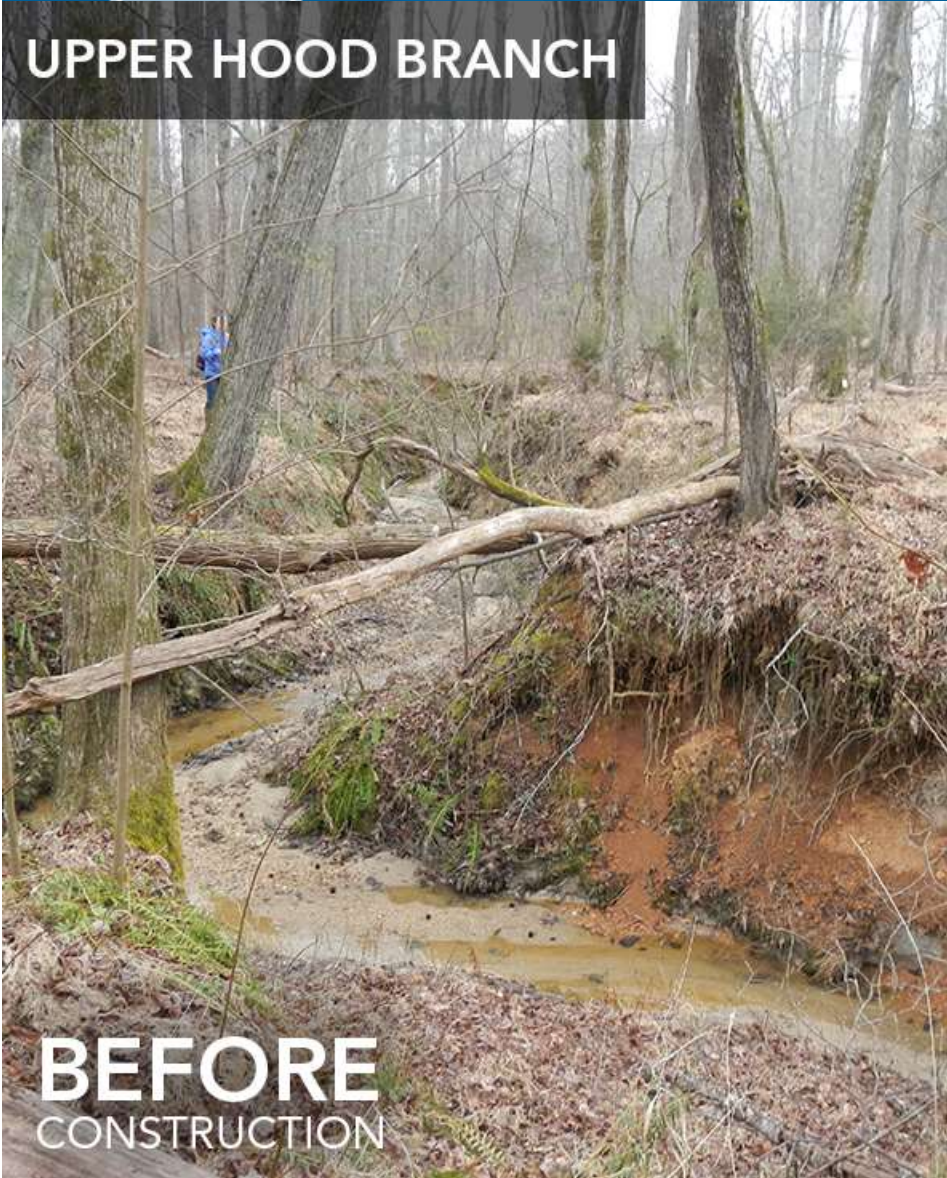




Construction Phase



UPPER HOOD BRANCH





Construction Phase



Online construction app

- Stakeholder updates
- Client updates
- Billing progress

Reedy Creek Construction Status Map



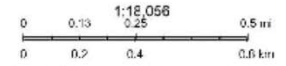
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Constructed Structures to Delete
Destructed Pier Piers
Consolidated With Modifications

Discontinued - Contractor In Default
Cancelled
Other

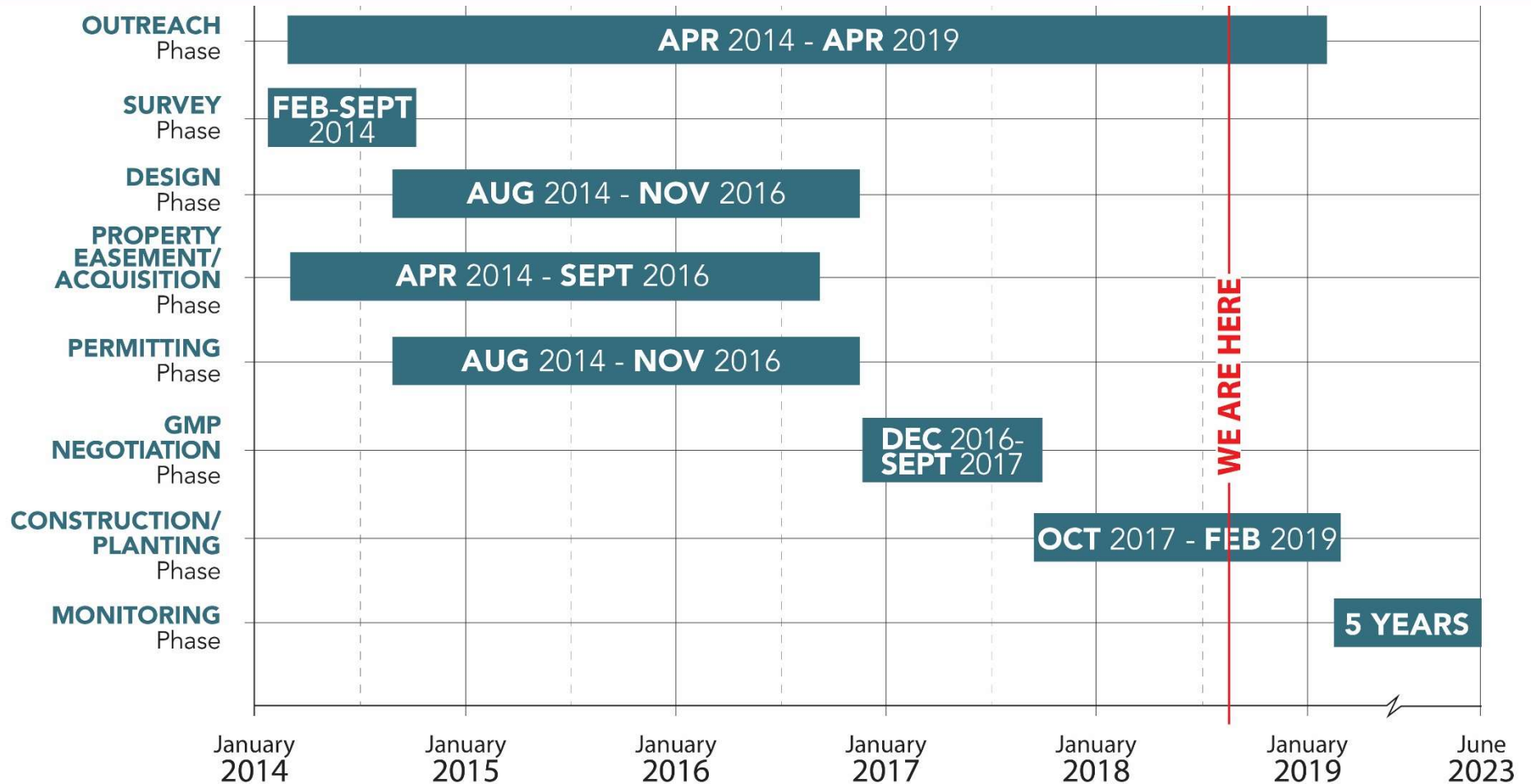
UNICC Monitoring Walls
Proposed Alignment
Stream Restoration

Stream Enhancement
Fishway Installation



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PROJECT BUDGET

Feasibility Study

\$80K

Design Phase

\$900K

- Assessment
- Easement acquisition
- Permitting and IRT credit negotiation
- Public meetings, project website

Easement Cost

\$400K

Construction, Monitoring, and Warranty

\$7.2M





Questions?



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