

Narbrook Park  
East Branch Indian Creek

Stream Bank Bioengineering Project

17

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# Bioengineering

## Bioengineering Materials



*Live stakes and brush mattresses installed in a stream bank stabilization site*



*Bioengineering materials installed in a riparian site*

**Soil Bioengineering** is the term used to describe the use of plant material to arrest and prevent slope and stream bank failure and erosion. The roots and stems serve as structural and mechanical elements in a slope protection system. Live cuttings and rooted plants are embedded in the ground in various arrays to serve as soil reinforcements, hydraulic drains and barriers to earth movement. Once established, this living material effectively controls a number of stabilization and erosion control problems by binding the soil with its root system and creating a natural, vegetative cover. Bioengineered sites are self-repairing and have the advantage of blending with natural surroundings.

**Figure 16-36** Coconut fiber roll details

**Cross section**

Not to scale

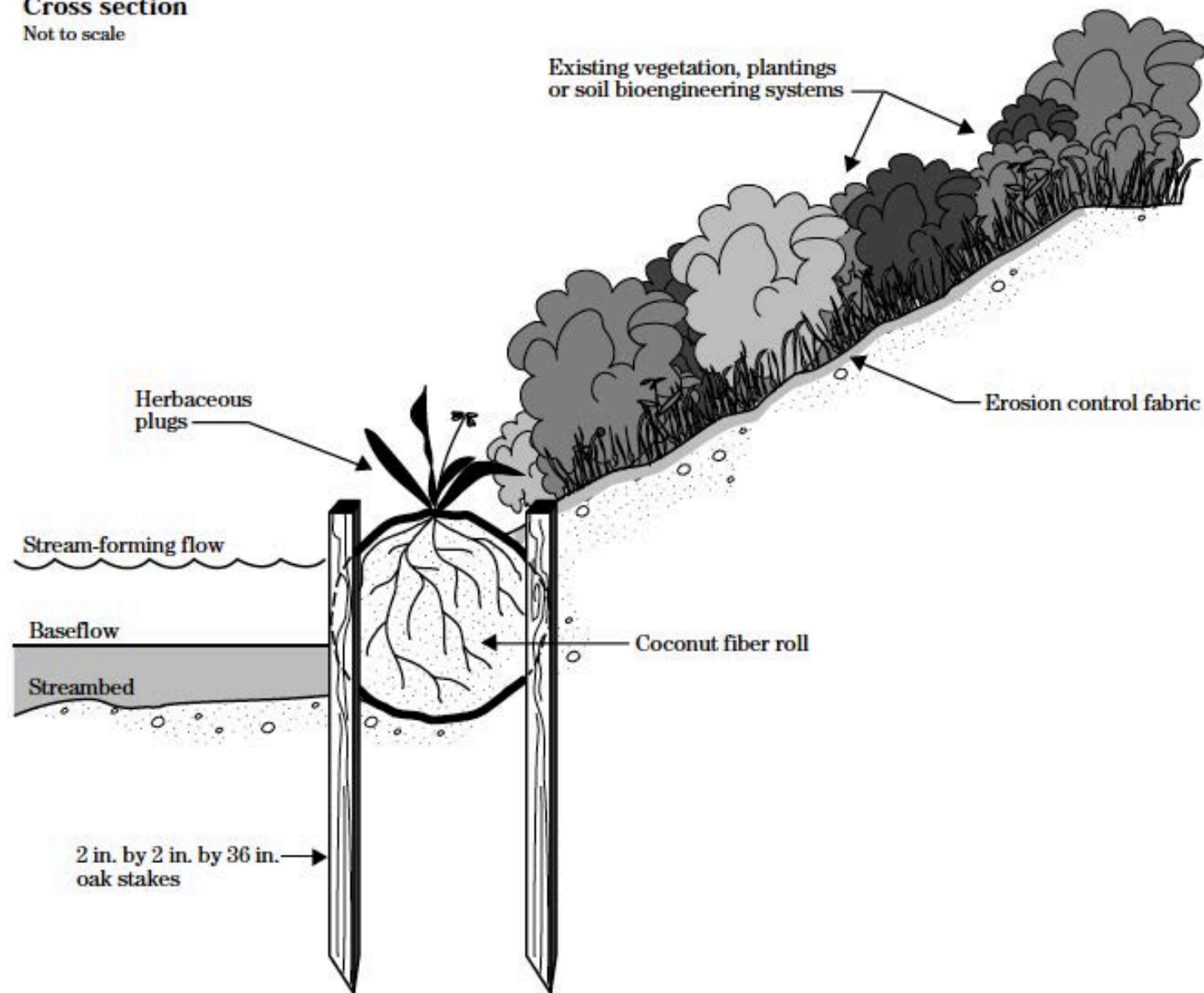
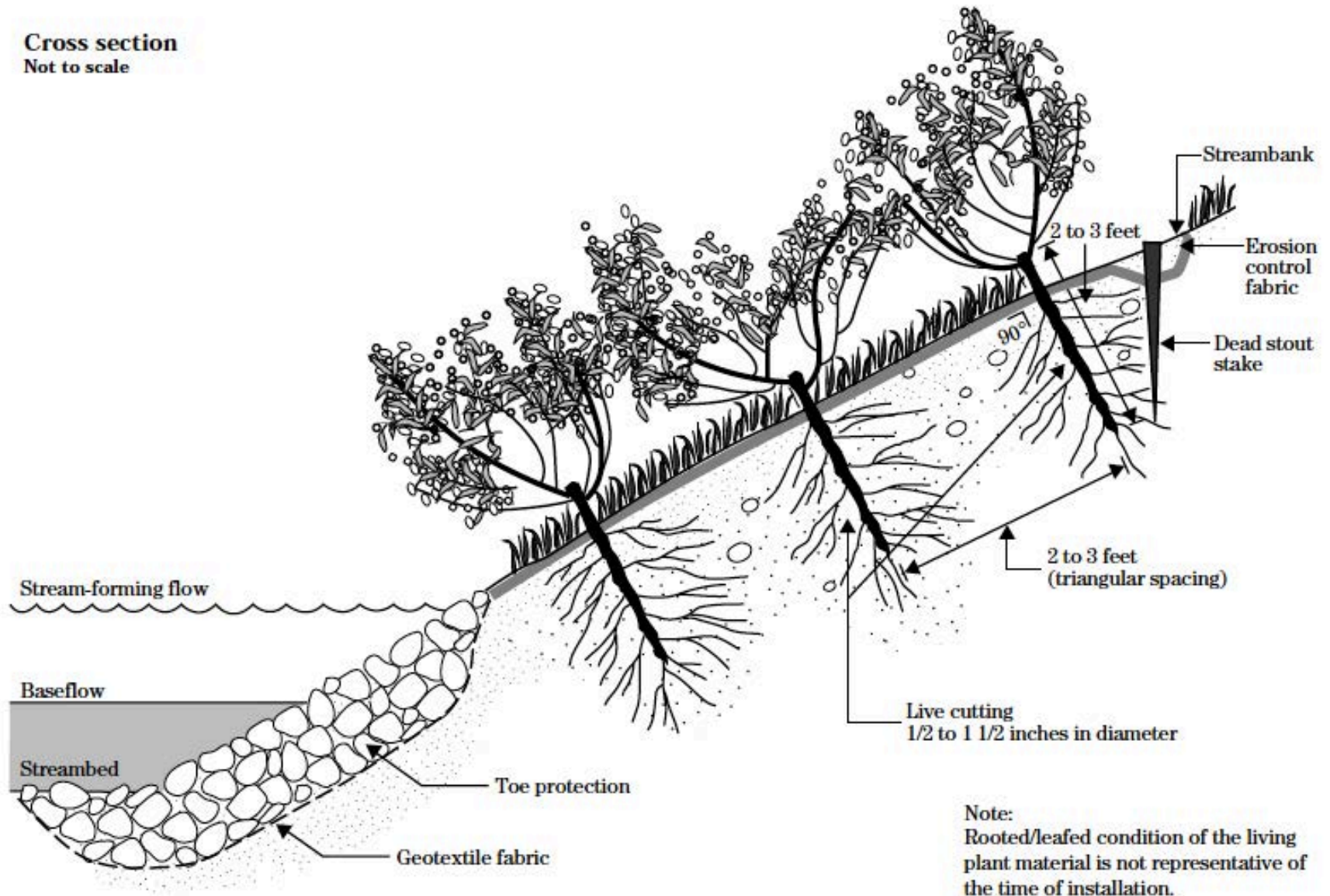


Figure 16-4 Live stake details

Cross section  
Not to scale

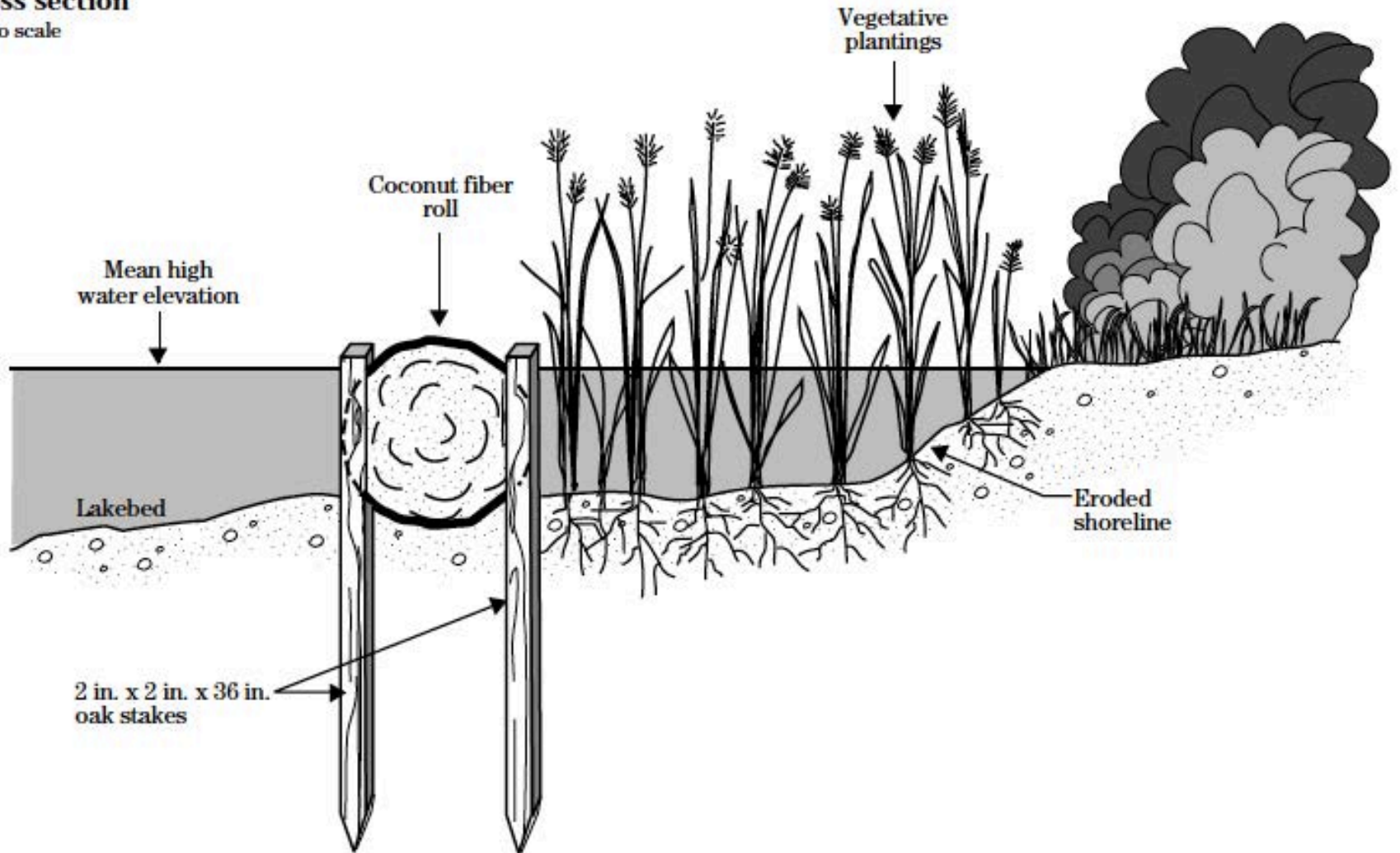


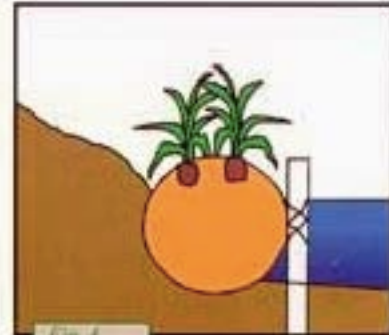
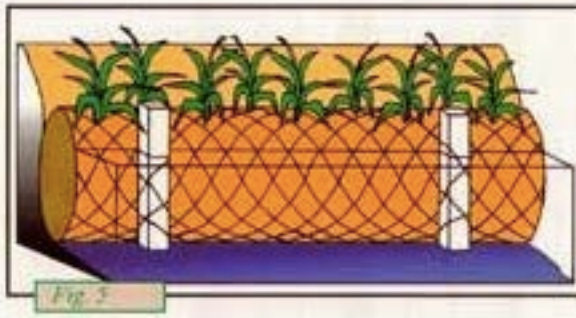
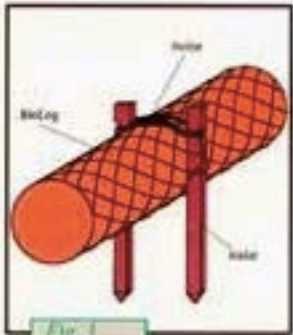


**Figure 16-56** Coconut fiber roll details

**Cross section**

Not to scale

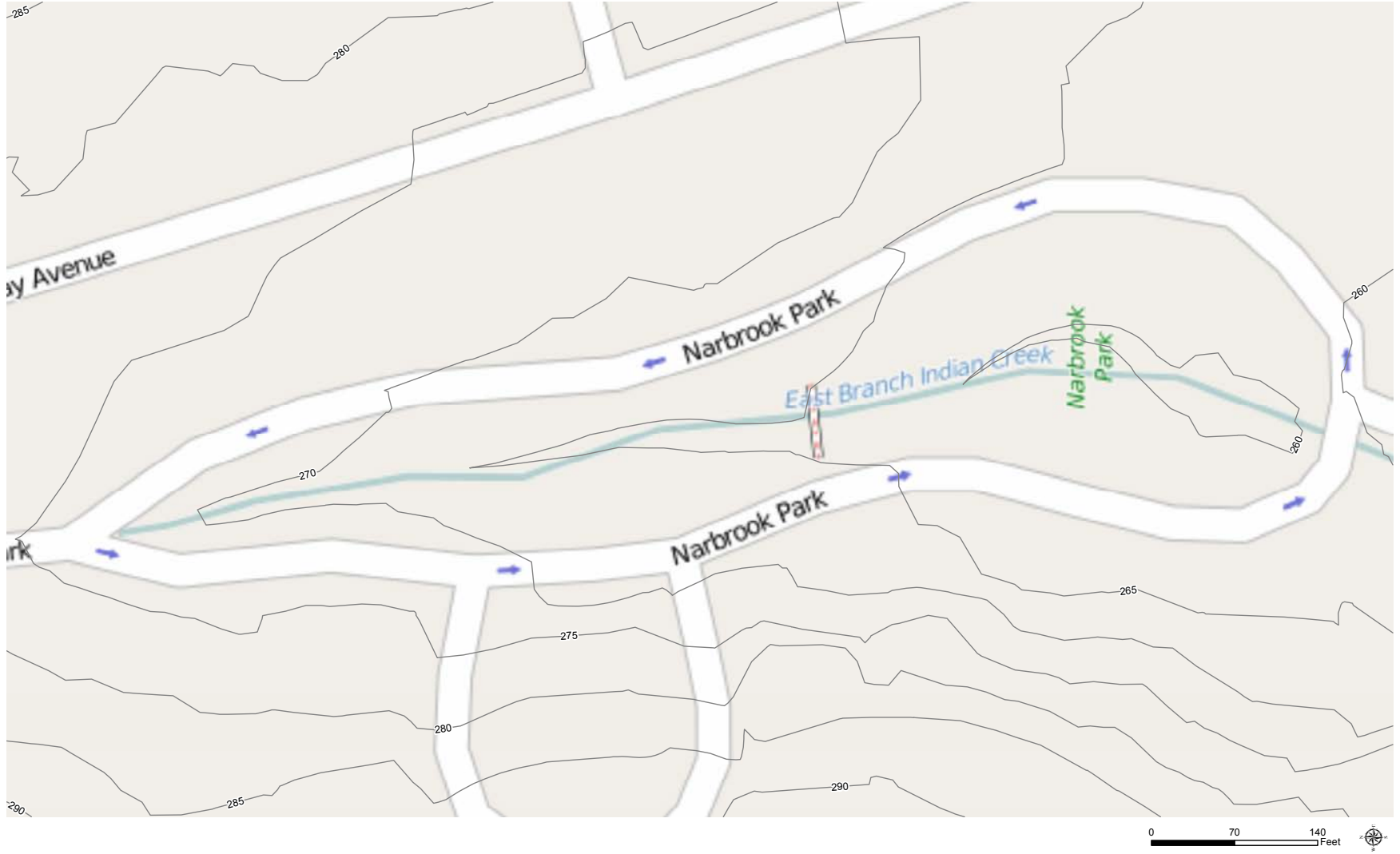




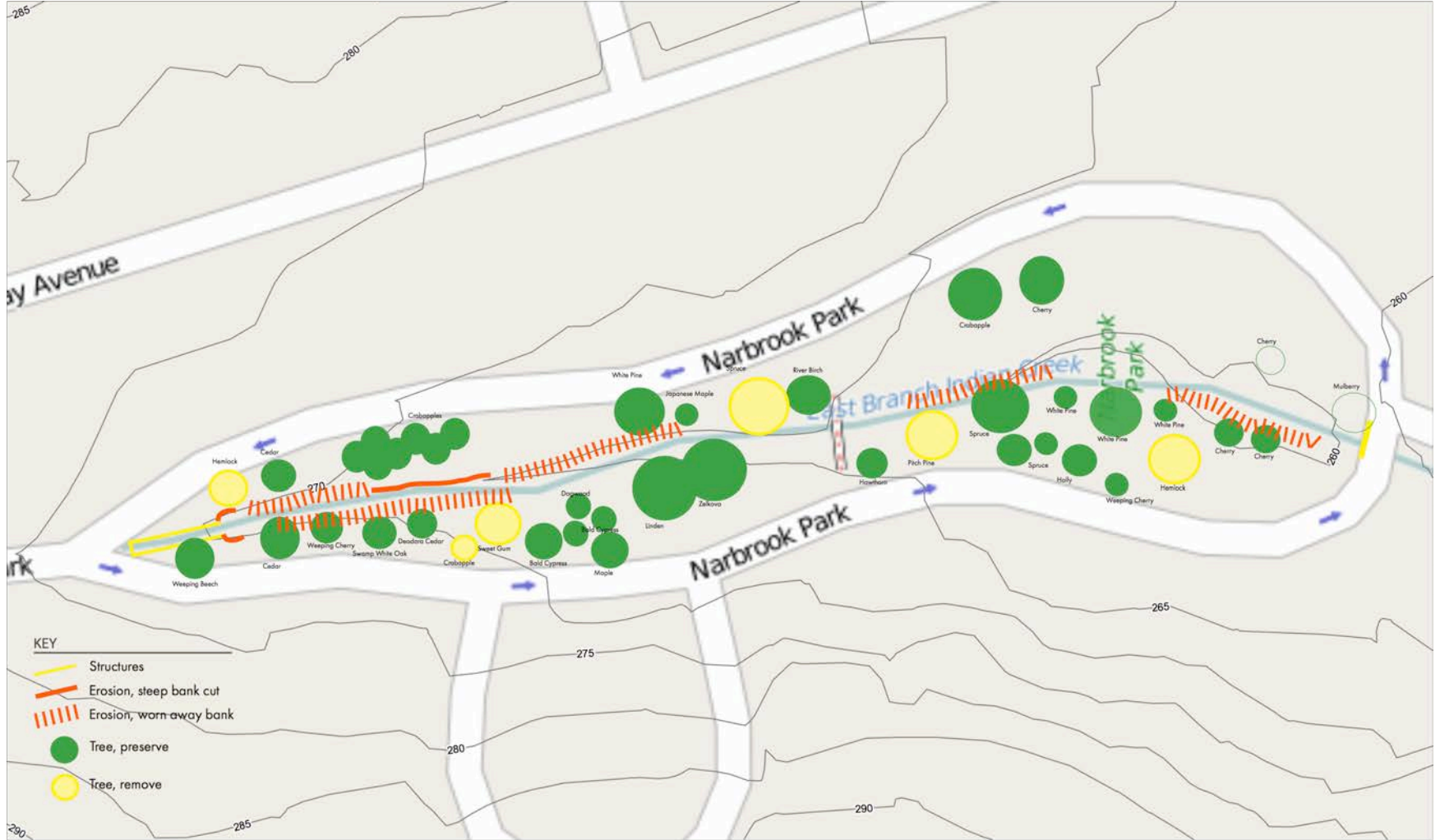




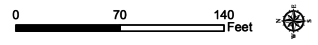
# NARBROOK PARK



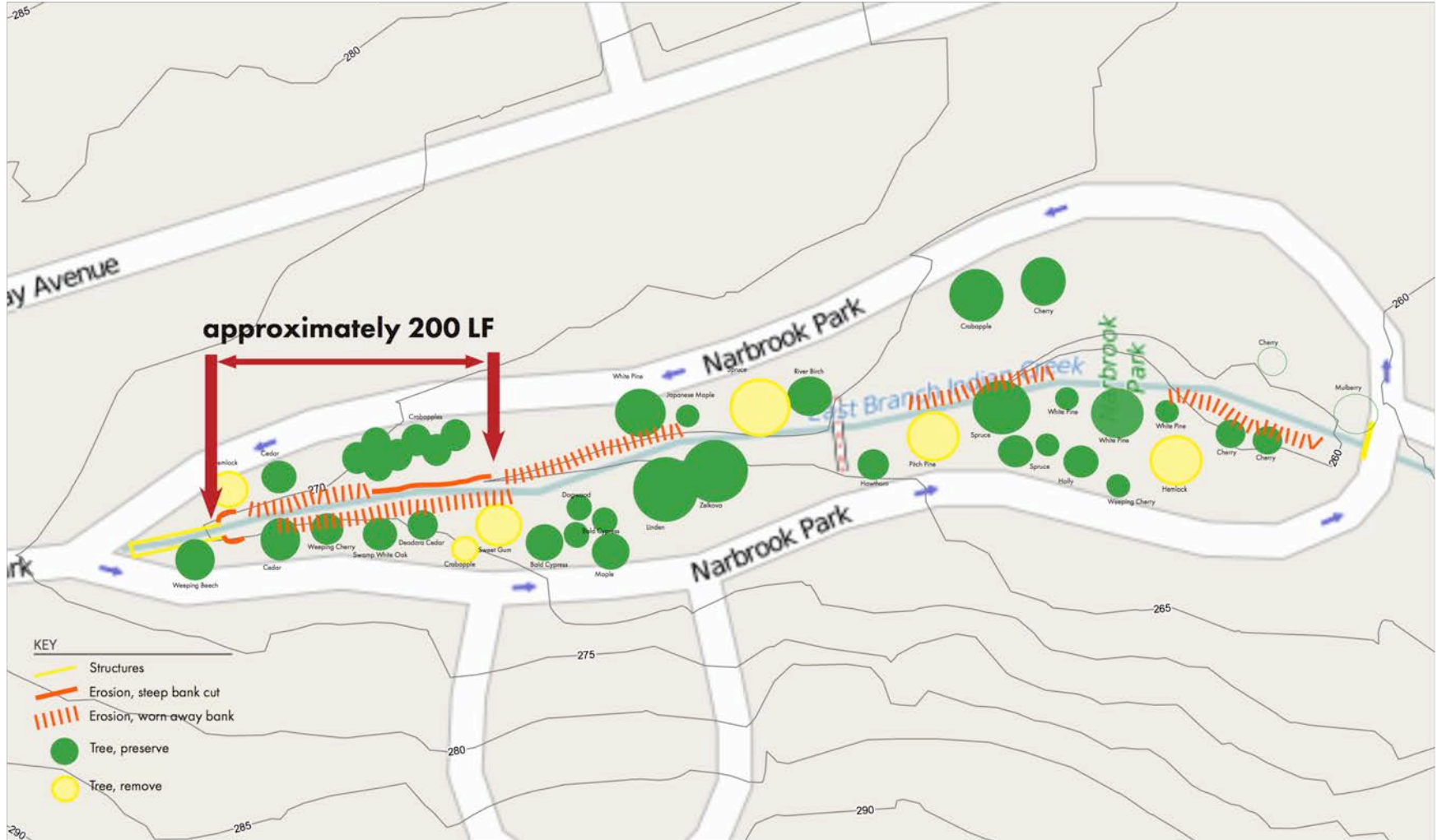
# NARBROOK PARK



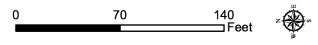
- KEY**
- Structures
  - Erosion, steep bank cut
  - |||| Erosion, worn-away bank
  - Tree, preserve
  - Tree, remove



# NARBROOK PARK



- KEY**
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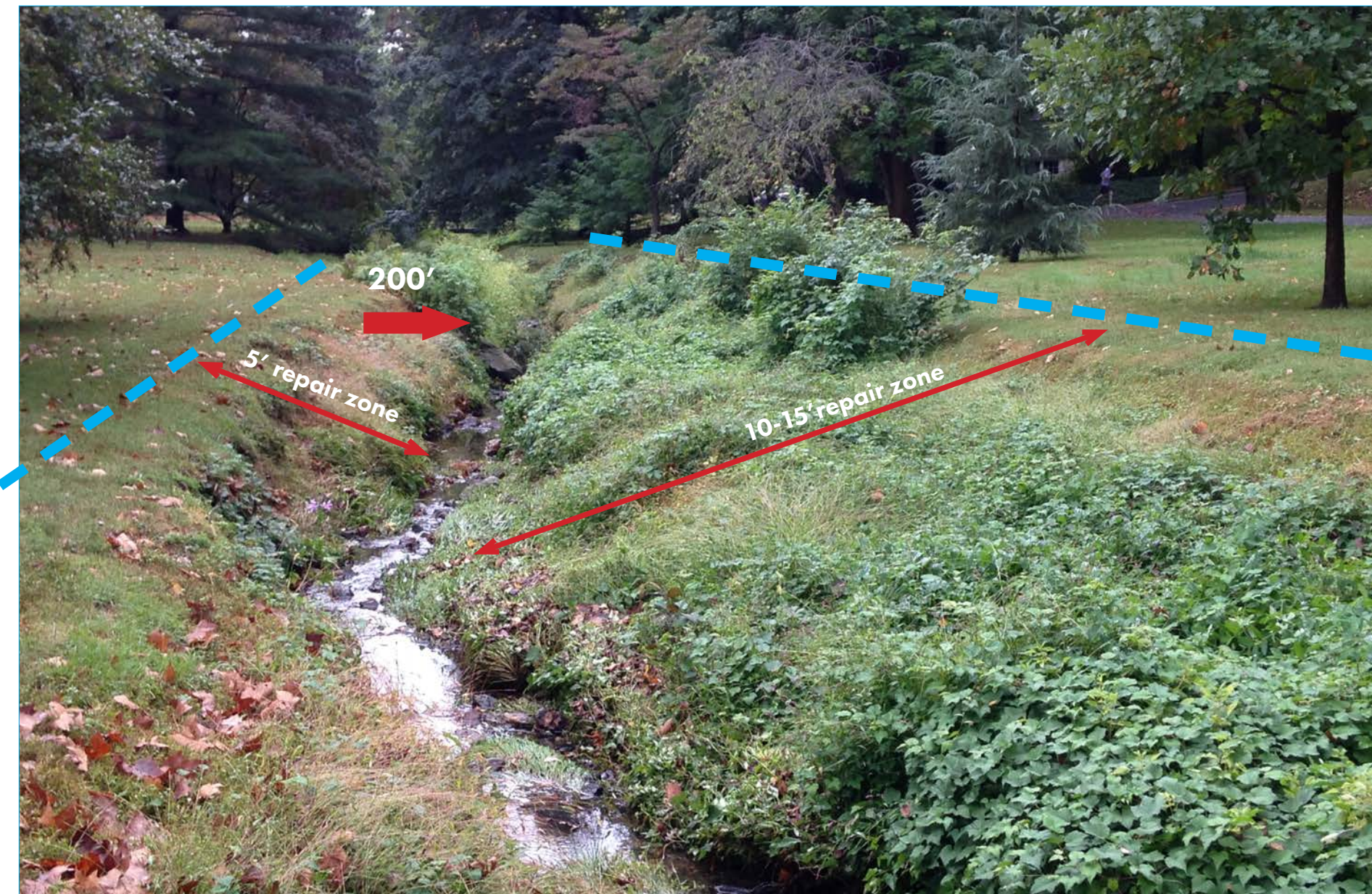


## Project breakdown:

1. Establish limit of work.
2. Remove standing dead trees (by others.)
3. Remove woody plants with weed wrench.
4. Remove remaining vegetation/ string trim to ground.
5. Selectively prune existing crabapple trees.
6. Use erosion control coir blankets and live stakes on steep (east) slope.
7. Use coir logs, blankets, live stakes on less steep slope (west) to build up new planting terrace.
8. Place boulders near end of channel and before steepest (east) slope.
9. Establish buffer area between existing crabapples and steepbank, plan native low understory shrubs and groundcover.







200'

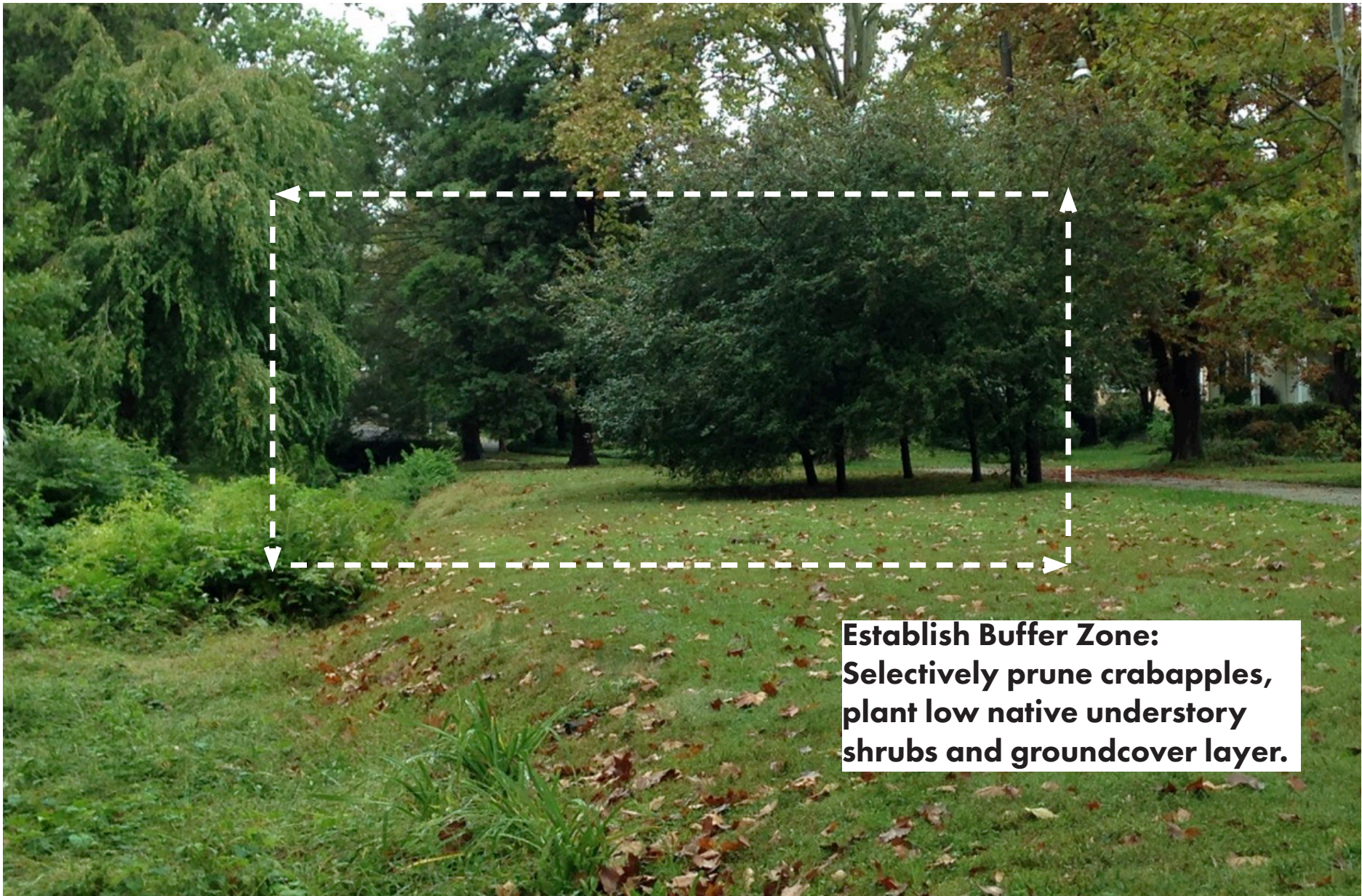
5' repair zone

10-15' repair zone

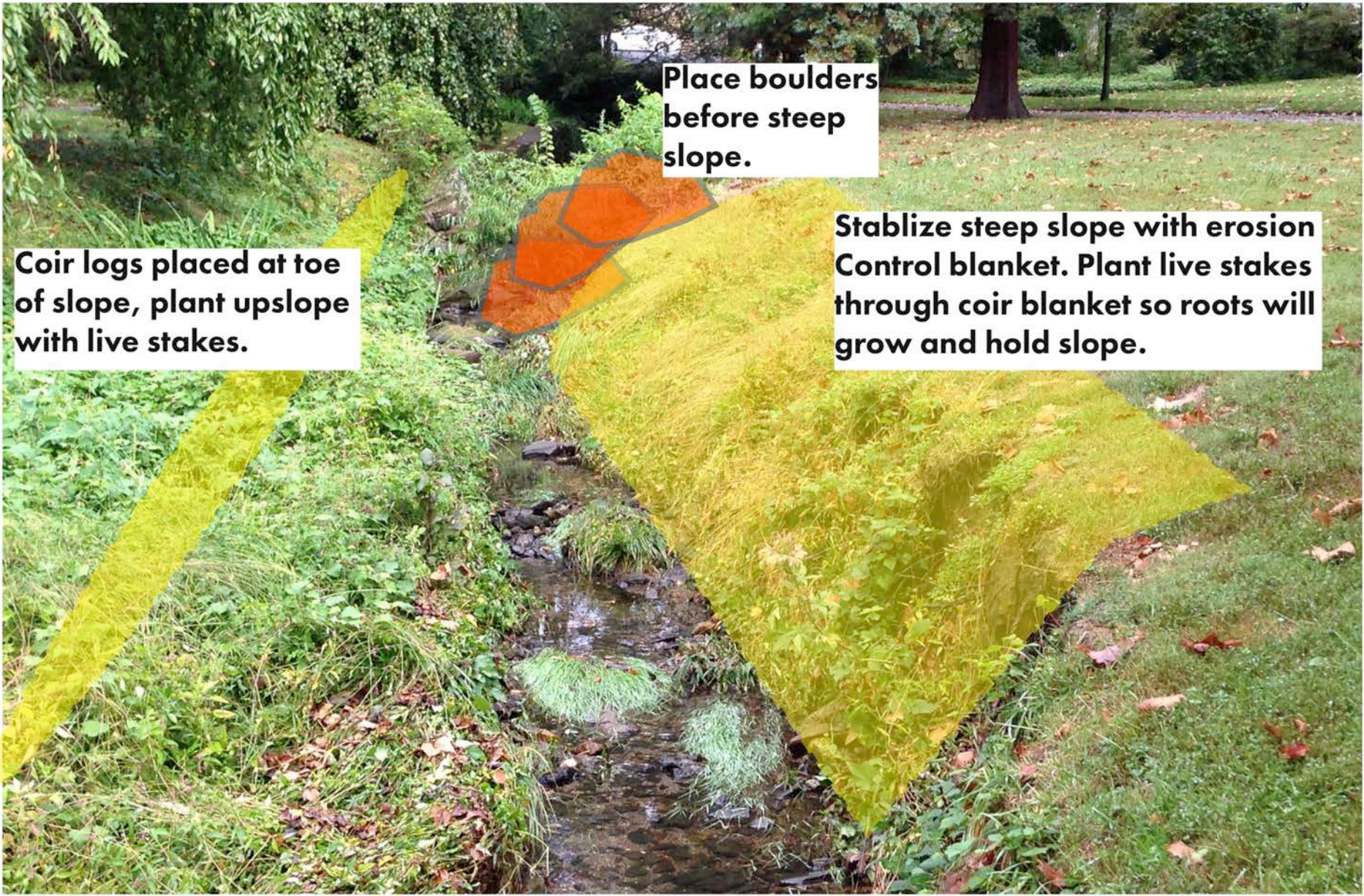


**Remove invasive woody plants with weed wrench.  
Remove remaining vegetation / string trim to ground.  
Minimize soil disturbance.**





**Establish Buffer Zone:  
Selectively prune crabapples,  
plant low native understory  
shrubs and groundcover layer.**



**Place boulders before steep slope.**

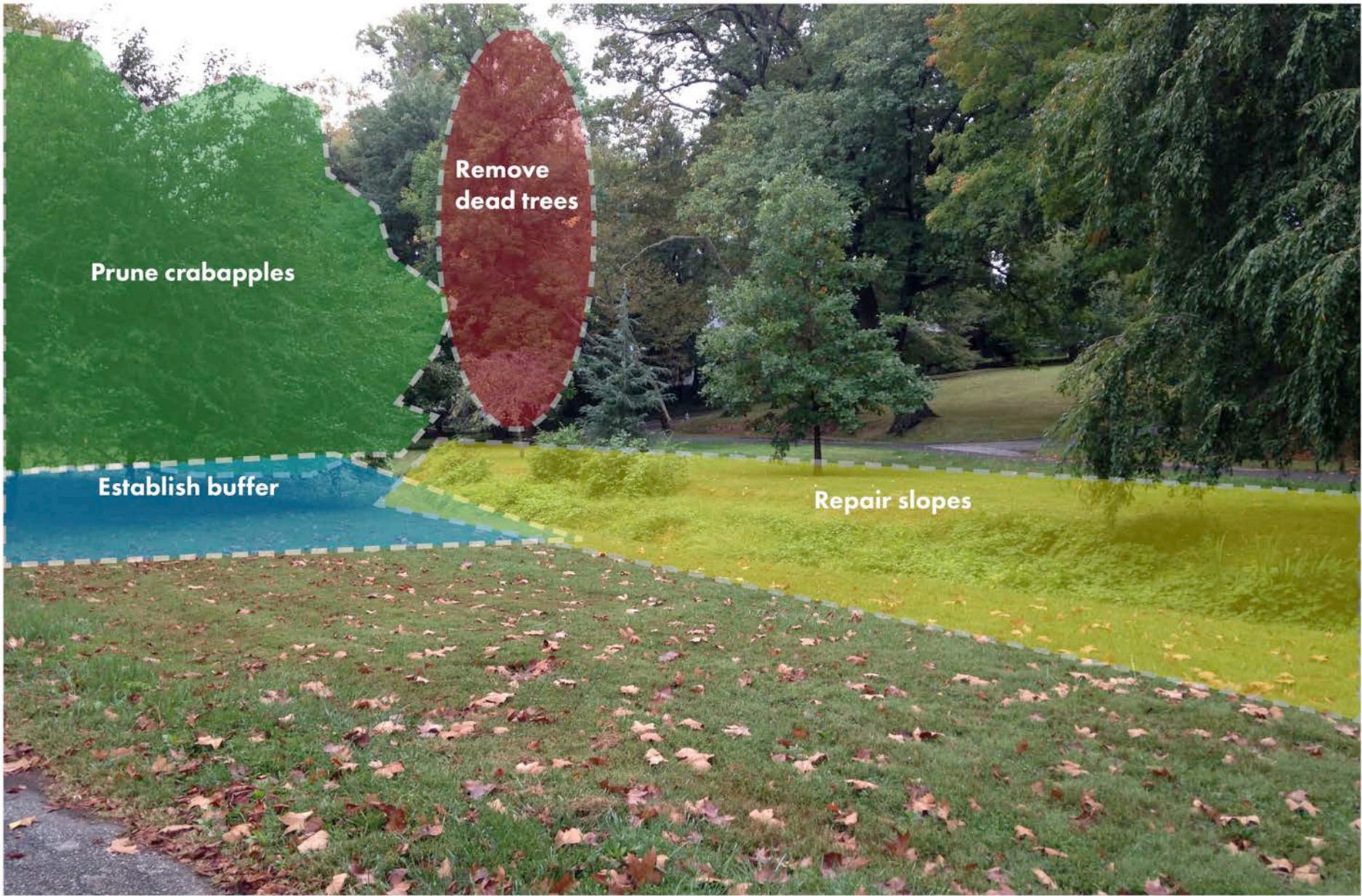
**Coir logs placed at toe of slope, plant upslope with live stakes.**

**Stablize steep slope with erosion Control blanket. Plant live stakes through coir blanket so roots will grow and hold slope.**



**Large tree removals:  
Hemlock (right, east bank)  
Sweetgum (left, west bank)**





Prune crabapples

Remove  
dead trees

Establish buffer

Repair slopes