



GV-Petro Joint Venture LLC

WATERSHED-SCALE RESTORATION IN A HIGHLY URBANIZED SETTING

Tinkers Creek Stream Restoration Project

Prepared for: National Stream Restoration Conference 2023

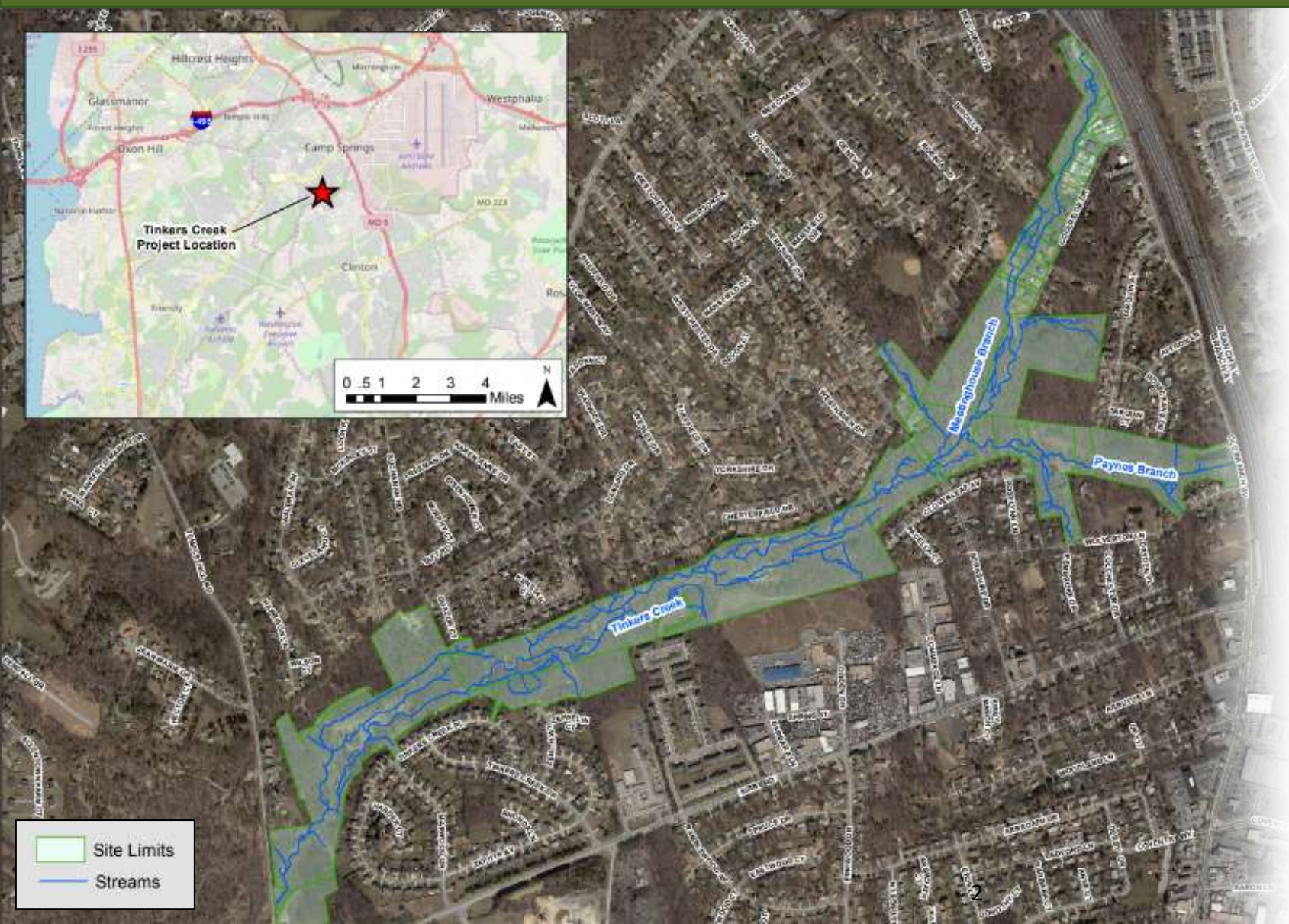
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Photo of Tinkers Creek Stream Restoration Project
Clinton & Temple Hills, Prince George's County, MD

OVERVIEW



1. Project Goals & Objectives
2. Existing Conditions
3. Design Approach
4. Implementation
5. Challenges
6. Outcomes

Figure of the 3 restored reaches with regional context.

PROJECT GOALS & OBJECTIVES

1. Provide Prince George’s County Department of the Environment (PG DOE) with IAT credits & load reduction to support their MS4 permit
2. Stabilize streambed & banks
3. Reduce erosion on public & private property
4. Protect public & private infrastructure
5. Improve wildlife habitat (secondary goal)

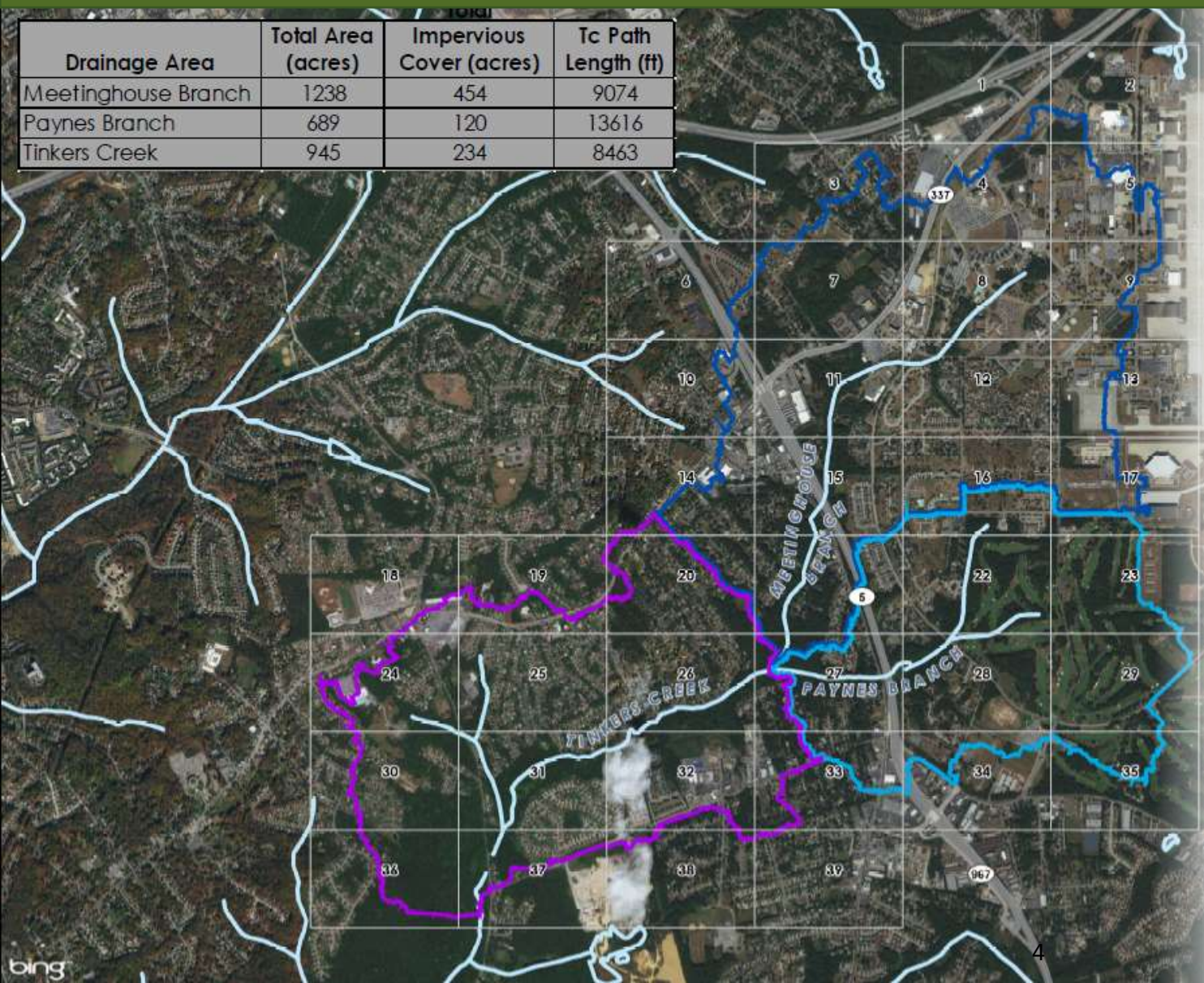
Project Team

The Project Team logos include: Parks & Recreation M-N C P P C, GreenVest (VISION - PERFORMANCE - RESULTS), EQR, Prince George's County DEPARTMENT OF THE ENVIRONMENT, ACTAEON, Petro DESIGN/BUILD, pH, and McCORMICK TAYLOR.



Photo of Tinkers Creek after Construction Completion in 2021.

EXISTING CONDITIONS



The past century of steady urbanization changed the landscape of the historically-forested Piscataway Creek watershed.

- Drainage area of 2,872 acres; 41% impervious area
 - ~25 BMPs in DA treating 19 impervious acres
- Channel historically straightened to accommodate sanitary sewer infrastructure installation

Left: Drainage Area of Tinkers Creek and its tributaries.

EXISTING CONDITIONS

Instability of the corridor led to increased erosion rates.

- Extreme BEHI
- Little bedform diversity
- Floodplain instability
- 51 headwater tributaries with headcuts and bank heights ranging from 5 to 20 feet
- Failing, threatened, or at-risk infrastructure and private property loss



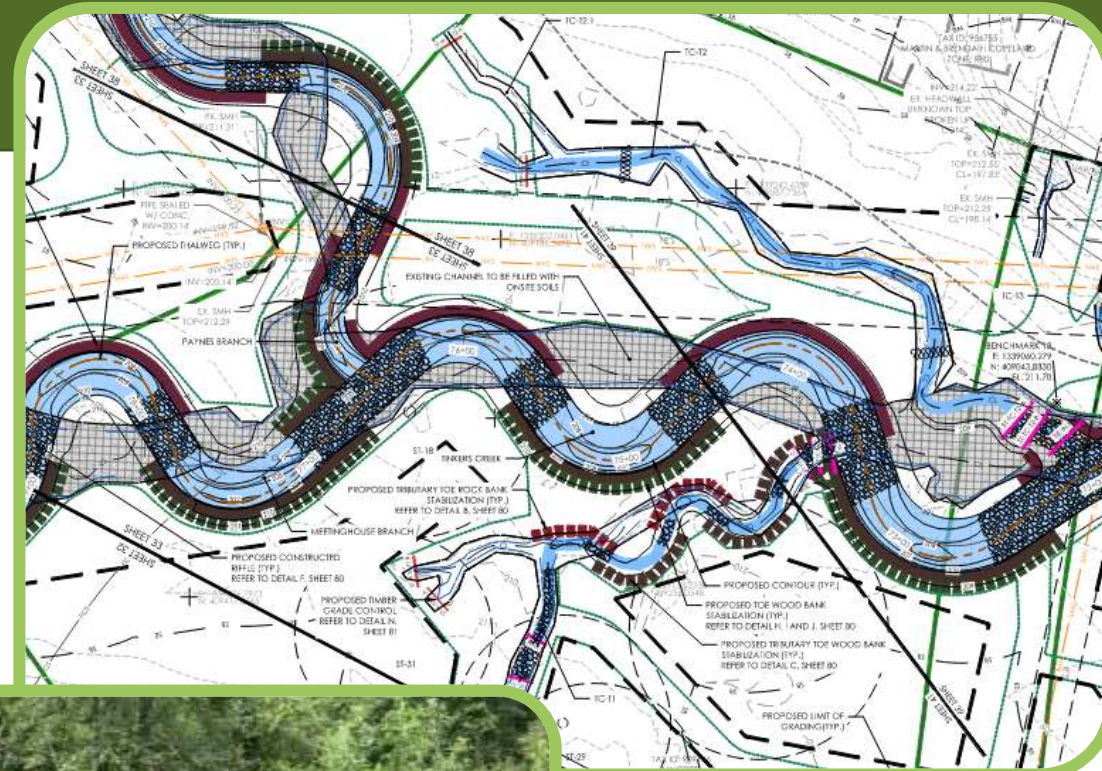
Above: Severe bank incision on Paynes Branch.

Left: Heavily eroded stream threatens adjacent fencing and residences.

DESIGN APPROACH

Project size presented opportunity for multiple design approaches:

- NCD principles overall within main channels
- Floodplain reconnection
- Multiple wetlands – wetland channels and concentrated flow paths provided opportunity to install “less is more” enhancement or stability
- Riffle-pool sequence structures for flow diversity and habitat – utilized all wood on site



Above: Design Plans for the project.

Left: Rock Plug adjacent to Tinkers Creek.

IMPLEMENTATION



- 40+ private landowners supported and participated
- 51% of specimen trees identified for removal were preserved
- Flexibility in implementation



Above: Photo of a preserved specimen tree. Rock root pack was used in lieu of rock toe to preserve mature trees within the forested corridor.

Left: Map depicting all public and private landowners in the project footprint.

CHALLENGES

1. Change in conditions in and adjacent to project area
2. Landowner proximity & communication
3. Flooding during construction
4. Material supply
5. Schedule



Above: Time lapse of construction and 6" storm on Paynes Branch scour pool.
Left: Photo of failed headwall and Stormwater pipe along Tinkers Creek tributary.

OUTCOMES

This large-scale, urban project is one of the largest stream restorations completed in Maryland.

- 40,600+ linear feet restored
- Considerable sediment & nutrient load reductions
 - 4,000,000+ lbs TSS
 - 12,000+ lbs TN
 - 1,600+ lbs TP
- 85% cover of designed species
 - NNI reduction from 45% to 10%
- High biodiversity
- Second-place recipient of Best Urban BMP in the Bay Award (BUBBA) in the “Best Stream Restoration” category



Above & Left: Mature photos of Tinkers Creek Stream Restoration Project in July 2023 (Year 3 of Maintenance & Monitoring).

OUTCOMES – Before & After



The same area of Tinkers Creek photographed before construction, after construction completion, and during Year 3 of maintenance & monitoring.

OUTCOMES – Before & After



Left: Chasm resultant of failed level spreader structure.
Above & Right: Photos of the restored SW infrastructure and repaired slope.

OUTCOMES – Before & After



Photos of the plunge pool system before and after restoration. The headcut resulted from large amounts of runoff from the surrounding impervious drainage area entering the channel at high velocity. The original channel was not appropriately protected for increased impervious area impacts. Restoration stabilized the failed existing plunge pool and downstream channel using grading, stream realignment, and rock grade control structures, thereby decreasing the velocity of incoming water, increasing the channel's stormwater capacity, and allowing limited floodplain access.

OUTCOMES – Before & After



The same view of a landowner's retaining wall immediately before and 3-years after construction.

OUTCOMES – Before & After



Photos of the confluence of Tinkers Creek, Meetinghouse Branch, and Paynes Branch before construction and in year 3 of maintenance & monitoring.

OUTCOMES – Before & After



Access road 1-month and 3-years after construction completion. The first two photos show maple volunteer seedlings immediately after access road demobilization. 3 years later, access roads are transformed by mature vegetation.



QUESTIONS & DISCUSSION



GreenVest

VISION • PERFORMANCE • RESULTS

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