



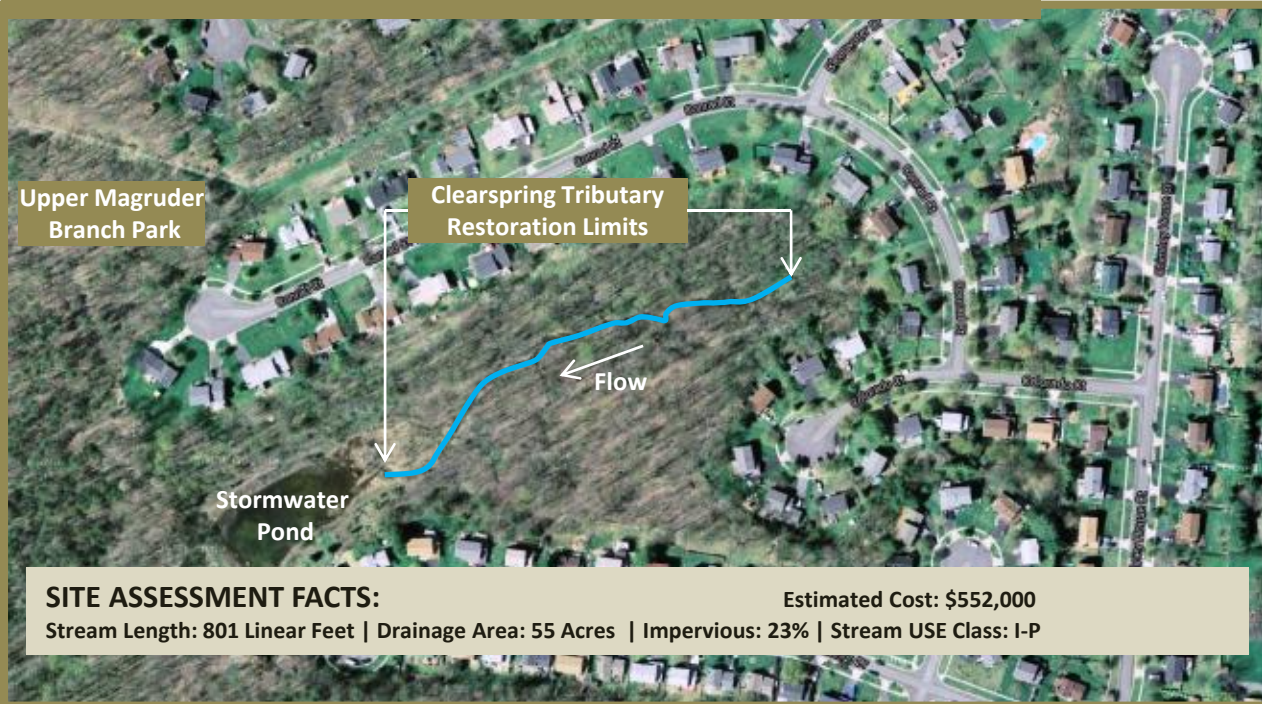
WRE 12-28 CONCEPT DESIGN

Department of Environmental Protection

Montgomery County, Maryland

Clearspring Tributary

Bank Stabilization & Stream Restoration Factsheet



SITE ASSESSMENT FACTS:

Stream Length: 801 Linear Feet | Drainage Area: 55 Acres | Impervious: 23% | Stream USE Class: I-P

Estimated Cost: \$552,000

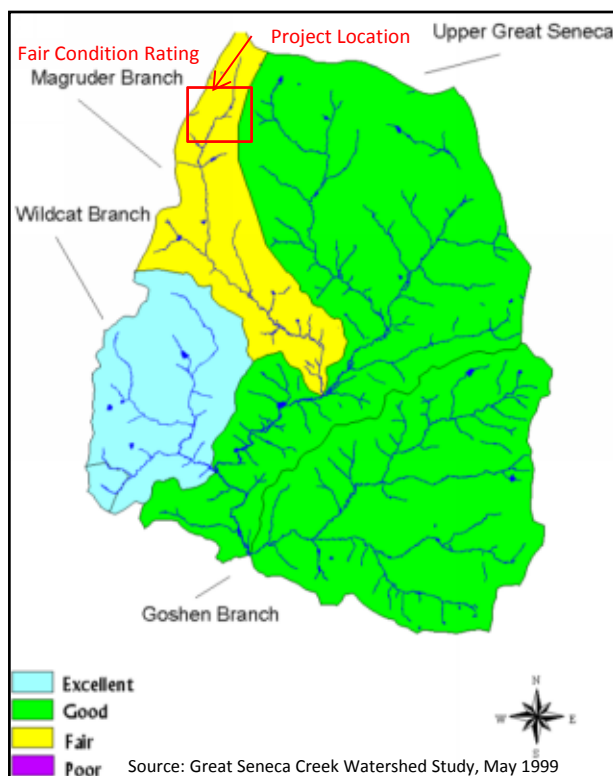
PROJECT SELECTION

The Clearspring Tributary Restoration (SR) is a project undertaken by the Montgomery County's DEP Division of Watershed Management as part of efforts to comply with the County's MS4 (Municipal Separate Storm Sewer System) permit requirements.

PROJECT GOALS:

- Restore Access to the Floodplain
- Improve Water Quality
- Improve In-Stream & Floodplain Habitat
- Create New & Enhance Existing Wetlands

The project site is located in the Clearspring Manor neighborhood in Damascus, Montgomery County Maryland. The project limits begin at the storm drain outfall west of Conrad Court and ends 801± linear feet downstream at the Clearspring Stormwater Pond.



EXISTING SITE CONDITIONS



Severe Head Cut Moving Up-stream



Bank Erosion Ranging From 6-8 Feet

Land use within the Clearspring watershed is a mix of low-density and medium-density residential. Development in the area began in the early 1960's when land use transitioned from mainly agriculture and forested lands to residential developments. As a result the headwaters of the Clearspring tributary have been piped and outfall into the project area from a culvert under Conrad Court.

During rain events, runoff from rooftops, roads, parking lots and other impervious surfaces is directed toward area storm drains. In the Clearspring drainage area no stormwater facilities are present upstream of the project site to provide water quality or quantity treatment. Stormwater is collected and conveyed directly to the Clearspring Tributary at an increased, erosive velocity.

The high flashy flows seen at Clearspring are typical in most post development tributaries. The combination of untreated and piped flows, and characteristics of the local soils within the Clearspring stream valley continue to degrade channel conditions and impair water quality downstream.

PROPOSED RETROFIT/RESTORATION OPPORTUNITIES

Montgomery County DEP is studying a number of restoration opportunities to restore the Clearspring Tributary. These opportunities include:

Channel Realignment

Increases flood control and directs damaging flows away from existing trees and channel banks. Restores channel sinuosity and allows for the creation of shallow aquatic habitat (riffles) and deep aquatic habitat (pools) to re-establish macroinvertebrates and fish communities.

In-Stream Structures

Riffles, step pools and other design interventions reproduce natural stream conditions by directing and dissipating flows.

Stream Bank Grading

Stabilizes bank stress and where possible, allow for floodplain access during storm events and periods of significant flows. Reduces bank erosion and stream sediment load.

Grade Control

In-stream grade control structures are implemented to reduce vertical instability and bank erosion. Grade controls such as cross vanes, step pools and v-drops, direct flow to the center of the channel, dissipating energy and reducing erosional stress along the stream banks.

Tree Stabilization & Floodplain Planting

Stream bank vegetation increases floodplain and in-stream habitat, stabilizes banks and helps maintain stream temperatures by providing shade during hot summer months.

Proposed Restoration Opportunities



Example of Riffle Grade Control



Example of Riffle / Pool Sequence