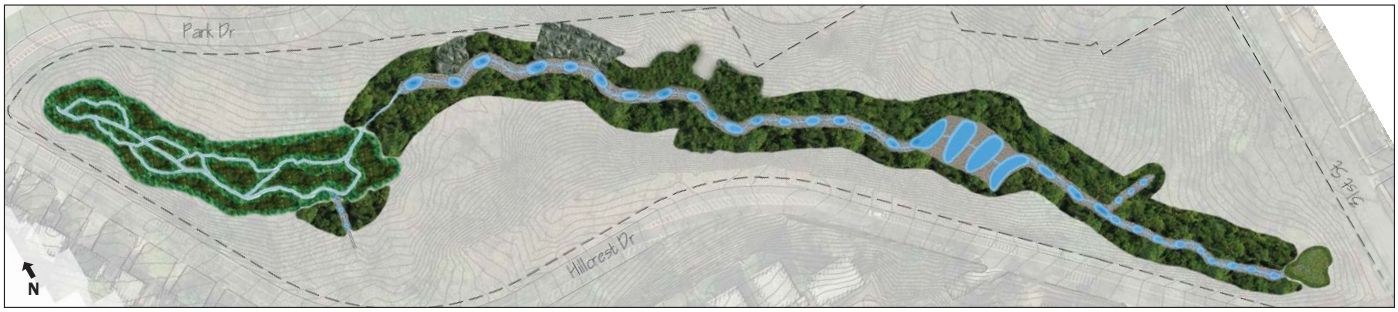
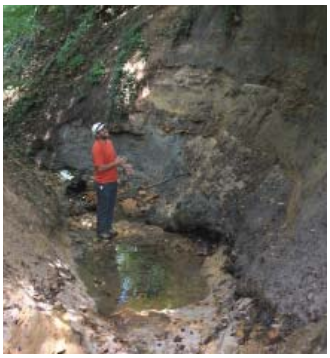
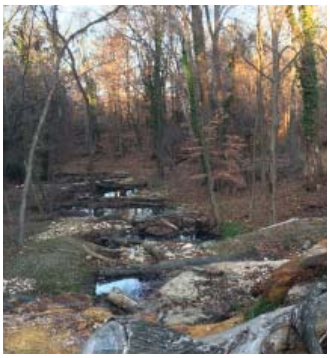
DISTRICT DEPARTMENT OF THE ENVIRONMENT

Alger Park Stream Restoration

Washington, DC







top: Stream restoration design
above left: Initial conditions;
above right: Proposed conditions

Alger Park is located in an area of Southeast Washington, DC where an estimated 32% of the watershed is impervious. Nestled within the park's steep, forested slopes is a headwater stream that ultimately drains to the Anacostia River. Stormwater runoff from the 35-acre sewershed that surrounds the park had degraded the steam, causing severe erosion and channel instability.

In an effort to help the District restore the stream's stability, habitat, and water quality, Biohabitats developed a design to restore 1500 linear feet of the stream. The upstream portion of the stream is characterized by steeply eroding valley slopes and stream banks, severe channel incision, and numerous headcuts. The downstream portion is a depositional area for a significant volume of sediment scoured from upstream reaches. A combination of excessive unmanaged stormwater flows from outfalls and overland flow pathways, along with steep topography, highly erodible soils, and invasive vegetation, are contributing to the impairments observed in the stream and surrounding park land.

Biohabitats began by assessing the watershed hydrology and stream geomorphology, existing natural resources, biological community, streambank erosion (BEHI), and stream stressors in the stream valley to anticipate load reductions and associated environmental uplift from the restoration. The team then created a design to return Alger Stream to a natural, self-sustaining stream that can resist stormflows generated in the developed watershed, and restore the ecological functions and habitat of the stream valley to the maximum extent practicable, while protecting the stormwater infrastructure that has been impacted by unabated erosion and deposition, and remove invasive species and re-establish a native plant community.

conservation planning
ecological restoration
regenerative design

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The design approach was intended to improve ecological function to the extent practicable based on existing site constraints. The project site constraints largely derive from the steep slopes and confined valley through which Alger Stream flows. Establishment of a floodplain connection is the most critical target for attaining restoration of stream function along the majority of the stream.

In upstream reaches, the restoration approach is primarily focused on increasing the interaction between stream flows and potential floodplain areas. Rather than restoring the channel at its current elevation, deeply incised in the valley, the proposed design is focused on raising the elevation of the channel bed to provide a reconnection with geomorphic surfaces that are currently suspended above and along the existing channel.

From a groundwater perspective, raising the stream invert restores a subterranean reservoir of the riparian area without the need for forest removal. With groundwater closer to the surface, historic wetlands, which have been drained by channel incision, may re-emerge. The additional stored groundwater is likely to increase and sustain baseflows during dry summer months. This is an essential parameter for sustaining aquatic biota. In addition, an increased hydroperiod will allow for more rapid establishment of native riparian vegetative communities, and suppression of non-native invasive species through development of a hydrologic regime outside of their normal tolerance range.

Restoration of the downstream reach will focus on modifying and enhancing wetland conditions, removing Japanese knotweed currently dominating the reach, creating additional habitat complexity, and improving adjacent connections to stormwater outfalls.

In order to maintain complexity in the wetland consistent with the existing wetland configuration, the design includes a multi-threaded channel with naturalized valley-spanning wetland grade controls.

Habitat, water quality, and stability are restored on one of the most highly eroded stream gullies in the District within Alger Park, a popular neighborhood stream valley park nestled in Southeast Washington, DC.

The proposed design integrates each of the existing storm sewer outfalls by eliminating large drops from existing outfall structures to the main channel and creating "bubbler" outlets that improve stability at outfall locations.

The Function-Based Framework (Harman et.al., 2012) was applied to the Alger Stream project to understand and illustrate likely functional improvements following restoration. Predicted sediment and nutrient load reductions were also calculated using recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects (2014). The predicted annual load reductions for Alger Park Stream Restoration is up to 257,700 lbs. of sediment/year.

Given the park's popularity and residential surroundings, communication and community engagement were essential for project success. Biohabitats participated in community site walks and attended community meetings during each phase of the design process to help the District ensure that residents understood the threats posed to the park by stormwater and that their questions were addressed.

Working with Limnotech to characterize the existing stream condition prior to construction, the project also includes one year of pre-construction monitoring; including water quality and flow monitoring, water quality monitoring to inform TMDL delisting, and macroinvertebrate monitoring.

SERVICES

Inventory & Assessments
Design
Permitting
Pre-construction Monitoring
Management
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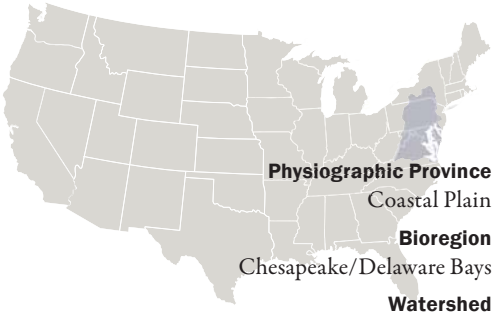

Physiographic Province
Coastal Plain

Bioregion
Chesapeake/Delaware Bays

Watershed
Anacostia River