

Bedfordshire Stream Restoration and Pond Retrofit

Potomac, Maryland



As part of its efforts to fulfill its MS4 permitting requirements, which are among the most rigorous in the country, the Montgomery County Department of Environment (DEP) hired the Biohabitats/Century Engineering joint venture to provide design services for the restoration of the Bedfordshire tributary in concert with a stormwater pond retrofit at the downstream terminus of the project. Situated within the Watts Branch watershed, where the iconic Luna Leopold performed essential research documenting the effects of urbanization on stream functional impairment,

the channel is an unnamed tributary to Kilgour Branch, which ultimately flows into the Potomac River.

Like many streams within the Washington, DC metropolitan area, the Bedfordshire tributary had become severely eroded by historic unsustainable land management practices and hydrologic manipulations associated with upstream watershed development. Pre-restoration geomorphic studies indicated that the channel was responsible for exporting significant amounts of sediment in downstream waters via bank erosional processes, degrading water quality, and

Ecological function and geomorphic stability are restored to a highly degraded stream within the watershed where Luna Leopold performed historic research underscoring the need for a new understanding of how humans manipulate riparian systems.

in-stream aquatic habitat. Multiple storm drainage inputs into the channel within the project area exacerbated this phenomenon, resulting in flashy peak flows associated with storm events.

In order to mitigate the effects of storm-driven peak flows and arrest the resultant bank erosion, Biohabitats developed a design to raise the bed elevation of the existing channel to convey higher intensity flows onto adjacent floodplain benches. The design also included the use of several in-stream structures, ranging from robust boulder grade control structures and in-stream large woody debris placement to softer touch methods including hand installed brush bundles on the outsides of sharp meander

bends. The overall effect of these measures, along with a riffle-pool bed profile, is significant enhancement in stream and adjacent riparian area functions, near elimination of sediment export, and improvement of habitat—both in-stream and within the enhanced floodplain forest along 1,100 linear feet of channel. Tasks associated with developing the restoration design included geomorphic and watershed studies, hydrologic and hydraulic analyses, federal, state, and local permitting, bid support, and construction phase services.

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