ECOLOGICAL & STREAM RESTORATION

Project Portfolio

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Contents

Upper Little Patuxent TMDL Stream Restoration

Project highlights

- Restores approximately 4,200 feet of streams.
- Reduces nutrient amounts by 3,560 lbs./year of TN and 1,254 tons/year of TSS.
- Through soil excavation of the post-settlement alluvium an additional 34,2000 lbs of TN, 12,600 lbs. of TP and 16,363 tons of TSS were removed from the system.
- Enhances stream substrate, improving habitat for fish, herpetofauna, and macroinvertebrates.
- JMT and its project partner Ecotone collaborated in Maryland Department of Transportation State Highway Administration's (MDOT SHA) first-ever TMDL-focused design-build stream restoration project at Upper Little Patuxent.

After with stable conditions

Prior unstable conditions

After with stable conditions

The project restored approximately 3,700 feet of the main stem and 500 feet of an unnamed tributary to meet NPDES, municipal separate storm sewer system (MS4), and total daily maximum load (TMDL) reductions for total nitrogen (TN) and total phosphorus and sediment (TSS), contributing to the degradation of the Chesapeake Bay. JMT, as lead designer, provided a cost-effective and stable solution using stream and floodplain restoration methodologies.

This project was honored in May of 2015 with an "Environmental Excellence Award" for outstanding achievement in MDOT environmental projects and programs, specifically for the team's efforts to prevent and eliminate pollution.

JMT's approach included both stream and floodplain restoration aspects, blended to meet the constraints of a narrow valley, existing forest resources, and confinement due to sewer line encroachments. The enhanced design methodology focused on providing water quality improvements, design stability for up to the 100-year storm, increased flood storage capacity, and dramatic reduction of sedimentation to downstream receiving waters.

Key benefits of this project include reconnecting the floodplain with the active groundwater table and enhancing hyporheic exchange. Another benefit was the creation of a dense riparian root system, which protects stream banks from erosion and promotes sediment and nutrient processing.

As a benefit through the design-build and agency coordination process, JMT reduced overall project wetland, stream, and forest impacts, and attained authorization through state programmatic and federal nationwide 27 permitting instruments.

As a result of the project, JMT was able to help MDOT SHA meet the following goals:

The protection of existing infrastructure while still conveying the 100-year and smaller flood discharges with stability.

Extensive reduction of sediment and nutrient pollution, contributing towards meeting TMDL goals for the watershed.

Preservation of existing wetland and forest resources, limiting project impacts through an iterative design alternatives analysis.

A noticeable lift of the existing ecological functions and values of the wetland and stream resources on the project site.

Smith Farm Wetland Creation & Mitigation

Caroline County, MD

Project Highlights

- Restores impaired resources and aquatic and terrestrial habitats.
- Restores hydrology to previously drained, ditched, and altered agricultural land.
- Preserves existing wetlands.

After with stable conditions.

On behalf of MDOT SHA, JMT designed a full wetland restoration site on a 67-acre farm that had "prior converted wetlands" to assist with mitigation needs associated with the MD 404 project on Maryland's Eastern Shore.

This project provided 35 acres of wetland mitigation by restoring impaired resources and aquatic and terrestrial habitats to provide water quality improvements and ecological uplift and diversity. JMT's design restored the hydrology to previously drained, ditched, and altered agricultural land, and preserved existing wetlands.

JMT performed a detailed hydrologic analysis at this site, which included analyzing the contributing drainage areas, reviewing and studying historic aerial images, analyzing precipitation history, and reviewing the groundwater data from 13 monitoring piezometers. Using this information, JMT designed a grading plan that used a minimally invasive grading methodology to restore hydrology to the site. This strategy allowed for precipitation to be retained on the project site and attempted to uplift the shallow groundwater table.

The groundwater monitoring indicated the current surface conditions of the proposed mitigation areas lacked the necessary hydrology to support wetlands throughout the site, and that a perched groundwater layer existed seasonally on the site. Grading had to be used to bring the surface elevation into proximity with groundwater hydrology, but it could not be lower than the semi-permeable confining layers.

Shallow, seasonally-flooded wetland systems were created within micro-pool, small depressional areas that hold surface water for extended durations, allowing hydrophytic vegetation to become established. It is anticipated that many of these areas will remain as emergent wetland systems. Herbaceous species were specified for these areas initially, however future monitoring will determine if these areas will support woody wetland species and a decision will be made whether to install woody vegetation in the future. The adjacent areas currently include pioneer woody species, such as sweet gum red maple, and are expected to colonize the site. In addition, an augmenting drainage pipe was proposed in the northeast corner of the project site.

For hydric soil conditions to be present, a minimum of one month of inundation/saturation must occur within the growing season. For this reason, grading was seldom designed to reach the seasonal maximum groundwater elevation, as it often occurs between November and April, outside of the growing season. During this time, both shallow and deeper groundwater profiles appear to converge and express as surface or near-surface hydrology.

During the grading process, over-excavation was used to ensure a finished surface of at least six inches of topsoil. Grading was feathered into adjacent areas, including adjacent wetlands, to ensure a continuity of grading, smooth transitions, and hydrologic connection to the adjoining wetlands where appropriate.

Prior to final seeding, woody debris was applied to the project site at a rate of approximately 80 tons per acre. The purpose of this material was to provide textural elements and woody substrates, which are essential carbon sources and habitat in wetland systems.

After with stable conditions

Little Catoctin Creek at US 340 TMDL Stream Restoration

Frederick County, MD

Project Highlights

- Restores more than 3,400 LF of streams.
- Removes the overburden of legacy sediment to create a floodplain wetland area of more than 8.4 acres, founded on previously buried hydric soils.
- Restores channel remains stable on a native quartz basal gravel layer through the entire hydrograph.
- Reestablishes stream and floodplain wetland system, creating extensive hyporheic zone vital to both water quality and microbial processes, which maintains stability utilizing native grass, herbaceous, and shrub vegetation.

After with stable conditions

The project restored more than 3,400 LF of the Little Catoctin Creek mainstream channel and tributaries to meet MDOT SHA's TMDL reduction goals by reestablishing a vast stream and wetland valley bottom through the removal of legacy sediments.

JMT designed and provided construction oversight to restore an expansive stream and wetland ecosystem using floodplain restoration. The restoration focused on the conversion of a highly incised and disconnected stream and floodplain to a low-energy, stable flow regime largely through removing the overburden of post-settlement alluvium or legacy sediment.

JMT performed a multitude of hydrologic, hydraulic, geomorphic, and biological studies to assess the causes of impairment and develop the proper restoration dimensions of the channel and floodplain. The studies performed also included an open trench investigation to determine the depth and extent of the buried hydric soil layer and basal gravels observed within the existing stream banks throughout the project site. The elevation of these features was used to form the basis of the proposed design.

The restoration established a highly connected floodplain to Little Catoctin Creek, providing a more balanced sediment regime and improved hydraulic and geomorphic functions that were highly impaired due to the overburden of legacy sediment. Channel dimensions and planform were designed to remain stable through the entire hydrograph on the native basal gravel layer without the need to armor the channel bed. Proposed channel geometry included restoring facet sequences and clean bed substrates along with creating in-channel habitat structures. It is intended these will increase stream diversity.

The reestablished floodplain is an average of 160 feet in width and created a vast wetland floodplain system, which maintains stability with native vegetation to the 100-year storm event. The entire floodplain surface was reestablished on a buried hydric soil layer, indicative of former stability, prior to European settlement. Woody materials, such as logs and branches, were used throughout the channel and floodplain bottom to add additional carbon back into the system and aid in the denitrification process. Micro-diversity on the floodplain created through grading operations, open water, and oxbow pools will create varied sources for forage, food, and habitat. The restoration of Little Catoctin Creek provides a significant opportunity for nature to reclaim all five levels of the Stream Functions Pyramid.

As a result of the project, JMT will help MDOT SHA achieve the following:

- Significant reductions in TMDLs for sediment, nitrogen, and phosphorus to meet program goals in restoring the Chesapeake Bay.
- Increased attenuation and treatment of stormwater run-off generated from US 340 and other state roads within the watershed.
- Greatly improved hydraulic and geomorphic stability.

Prior unstable conditions

After with stable conditions

Nash Run Stream Restoration

Washington, DC

Project Highlights

- Restores approximately 1,400 feet of streams.
- Includes a trash BMP collection system capable of removing 100% of all floatable trash prior to entering the restoration.
- Creates 1.08 acres of wetlands in an urbanized area of Washington, DC where none previously existed.
- A variety of native tree, shrub, and herbaceous species adapted to the hydrologic regime were planted.
- Significant cost savings through assisted contractor negotiation.

After with stable conditions

After with stable conditions

JMT designed approximately 1,400 feet of stream restoration within Washington, DC limits for The Watershed Protection Division of the Department of Energy and Environment (DOEE), in cooperation with the Stormwater Management Division of DOEE.

The project was originally tasked as an 800-foot reach of stream restoration and increased to 1,400 feet once DOEE recognized the additional benefits that could be achieved through JMT's approach. JMT developed final designs and bid ready construction documents to restore a highly degraded section of a first order tributary to the Anacostia River to provide water quality improvements and meet TMDL and MS4 permit requirements for the Anacostia River. JMT's services continued following advertisement, assisting in bidder evaluation and negotiation; saving DOEE approximately $600,000 from the selected contractor's initial bid.

Nash Run is an ultra-urbanized tributary with 49% of the watershed covered by impervious area that contributes 3% of the total floatable trash load to the Anacostia River. The entire watershed upstream of the project area is piped, resulting in a flashy urban system with intense discharges, confined within 15-foot vertical banks. JMT delivered an integrated design that maximizes removal of trash and sediment from stormwater, provides the stable conveyance of flood flows, and increases water quality and ecological functions. JMT's design focused on maximizing floodplain area to provide re-connection, flow attenuation, riparian wetland creation, and aquatic and riparian habitat enhancements. JMT integrated multiple restoration and stabilization measures to create a naturalized system, utilizing woody debris and other measures to improve habitat and reduce erosion.

To meet hydraulic constraints, JMT assessed several trash and debris collection systems. Ultimately, JMT worked closely with Storm Water Systems in Atlanta, GA, to develop the custom fit trash collection unit that would remain permanently in the upstream scour hole to capture 100% of floatable trash and polluted organic street matter as part of an integrated ecosystem restoration approach.

JMT also provided flood relief for several adjacent properties by reducing the extent of the 100-year flood boundary through the design of a new culvert crossing midway along the restoration reach. The culvert replacement included a multiple cell design to provide more efficient conveyance as well as aquatic organism passage by depressing the main cell bottom to create a backwater permanent pool elevation.

Supporting services included a geomorphic watershed and sediment mobility analysis, streambank/soil analysis, flow gage installation/analysis, H/H analysis, erosion and sediment control design, archaeological investigations, and environmental permitting. Multiple properties where affected and as such community outreach/coordination was essential to project success.

JMT assisted DOEE in meeting the following goals:

- Floodplain, ecological, and TMDL goals met through an integrated approach.
- Reduction of construction costs through assisted contractor negotiation.
- Protection of property and infrastructure.

Stemmer's Run Stream Restoration

Baltimore County, MD

Project Highlights

- Restores approximately 4,000 feet of streams.
- Stream restoration assessment, monitoring, and design for Stemmer's Run through the I-695/ I-95 interchange.
- Design conveys the stream through the re-constructed interchange, which includes 29 bridge piers.

After with stable conditions

JMT, in support of highway reconstruction for MDOT Maryland Transportation Authority (MDOT MTA), completed a detailed stream relocation and restoration plan for 4,000 feet of Stemmer's Run and its tributaries.

JMT completed a detailed existing and ultimate conditions hydrologic analysis for the 4.1-square-mile watershed using the methodology detailed in the Maryland Hydrology Panel Report, which involved flood frequency analysis and weighting of the fixed region regression results based on a downstream gage. Ultimately, a calibrated TR-20 model was developed. Hydraulic floodplain models for existing and proposed conditions were developed using the USACE HEC-RAS, Version 3.1.3.

JMT accurately modeled the proposed bridges and culverts and restored stream valley to precisely account for the hydraulic impact of the 29 bridge piers within the interchange.

A detailed H/H report was prepared and submitted to FEMA for a letter of map revision for the revised portion of Stemmer's Run upon completion of the construction project.

JMT assessed the overall geomorphologic characteristics of the stream to determine stability and sediment regime, including quantitative and qualitative assessments of plan form, channel dimension, streambed profile, channel material composition, and loading rate.

The highly constrained stream valley presented several challenges that drove many of the critical design components of the stream restoration. The downstream limit of restoration was defined by new culvert design requirements to maintain existing flood control and the upstream limit was defined by the extent of the MDOT MTA right-of-way and preservation of an existing bridge. The plan form was constrained by the multitude of bridge piers/abutments and roadway geometry requirements. Due to the bimodal sediment regime of the reach, the design approach used a compound channel to accommodate a range of discharges and associated sediment transport capacity.

In-stream structures were designed for low-flow habitat, grade control and reduction of near-bank stress. Coupled with an enhanced substrate and reconstructed facet sequence, in-channel habitat was improved for a variety of aquatic species and benthic macroinvertebrates. Flow separation features, critical to the foraging and spawning of forage fish species, were also integrated into the restoration plan.

The team's design daylighted nearly 900 feet of multiple piped portions of stream, and restored floodplain function to entrenched sections of the existing channel.

JMT assisted MDOT MTA in meeting the following goals:

- Developing a stable stream location and restoration plan to protect infrastructure as well as enhance habitat.
- Daylighting previously piped stream channel.
- Developing a LOMR for FEMA floodplain compliance.

Prior unstable conditions

After with stable conditions

Unnamed Tributary to Cranberry Run Restoration

Harford County, MD

Project Highlights

- Restores approximately 800 feet of streams.
- Minimizes impacts to wetlands, waterways, and floodplains.
- Maintains/discharges natural groundwater flows and seeps associated with waters of the U.S. and wetlands.
- Replaces existing deteriorated steam channel with a new stream and highly attached floodplain.

After with stable conditions

 Prior unstable conditions

After with stable conditions

JMT was the lead designer for this project located adjacent to Aberdeen Proving Ground (APG).

The interchange enhancements needed to accommodate additional personnel being relocated to APG as part of the U.S. Department of Defense's BRAC initiative. JMT restored approximately 800 feet of an unnamed tributary to Cranberry Run from its confluence with Cranberry Run, relocating it from the roadway footprint and restoring a natural channel and floodplain.

This coastal plain stream had been highly altered by roadway and industrial development encroachments to the stream corridor, including channel straightening, piping of open channels, and the installation of roadway embankments and culverts across the floodplain resulting in a stream system that is laterally confined and incised. The project goals were to minimize impacts to wetlands, waterways and floodplains; maintain and discharge natural groundwater flows and seeps associated with waters of the U.S. and wetlands; provide a new stream channel and associated floodplain, which is capable of conveying water and sediment in a stable manner; and replace the existing deteriorated stream channel with a new stream having natural channel features to improve water quality and ecological benefits.

The proposed design approach for the relocation/restoration of the stream channel provided a sustainable stream system with a channel capable of maintaining its natural bed material of sand and small gravel with a highly attached floodplain. This lowered channel shear stresses and resulted in stream corridor stability, the creation of floodplain wetlands, water quality improvements through floodplain settling and filtering, and improved habitat for a variety of aquatic, terrestrial and macroinvertebrate species.

JMT performed a geologic study, watershed assessment, discharge analysis, geomorphic assessment, hydraulic analysis, and sediment mobility assessment of the stream corridor. The hydrologic analysis was performed using the Natural Resource Conservation Service (formerly SCS) Technical Release 55 (TR-55) and 20 (TR-20) hydrologic models and the hydraulic analysis was conducted using HEC-RAS.

JMT prepared the geomorphic design report, construction drawings, erosion and sediment control design, and landscape design and obtained MDOT SHA approvals, MDE erosion and sediment control and non-tidal wetlands and waterway approvals.

JMT assisted MDOT SHA with meeting the following goals:

- Relocating and restoring a portion of stream and adjacent floodplain to protect infrastructure.
- Eliminating sediment and attached nutrients to the downstream receiving waters.
- Enhancing habitat through an uplift of stream and wetland functions and values.

Mill Creek Mitigation Bank

Richland County, SC

Project Highlights

- Naturalizes and conserves 1,360 acres of essential flood plain habitat in perpetuity.
- Restores and enhances 298 acres of wetland.
- Restores and enhances 27,730 LF of stream.
- Improves and restores habitat for the federally threatened wood stork and other species.
- Flood attenuation and filtration

With infrastructure being a high priority for South Carolina over the next two decades, approved projects will require mitigation credits to offset unavoidable impacts to wetlands and streams. To meet this need, JMT (previously as Tidewater Environmental Services) has received state and federal approval of credits on the Mill Creek mitigation bank.

The bank, located near Congaree National Park, is one of the largest banks in the state and has been highly coveted by conservation groups. The project was conceived, planned, and permitted by JMT through an innovative model using public-private partnerships and cooperation. Ultimately, Richland County aims to create greenways and trails to conserve, enhance access, and use these abundant natural resources.

JMT will develop the mitigation bank on 1,360 acres of land. The bank will conserve, restore, and enhance 685 wetland acres and 35,262 LF of streams, which will be returned to a more natural condition through removing a dam and other man-made obstructions. This will improve connectivity and naturalizing hydraulics and bio complexity. A significant area of natural bottomland hardwood floodplain will be restored from open fields and planted pine. The project will preserve a complex of naturalized resources, which will enhance foraging habitat for several species, including the federally threatened wood stork.

After with stable conditions

In Progress

I-270 at Watkins Mill Road Interchange Stream & Wetland Restoration

Montgomery County, MD

Project Highlights

- Restores approximately 5,200 feet of streams.
- Flood attenuation and reduces sedimentation addressed in the same design methodology.
- Reestablishes dense riparian root system, which promotes and increases sediment and nutrient processing.
- Blends stormwater management and ecological restoration into a sustainable natural system.
- Provides functional uplift of natural resources.

After with stable conditions

Prior unstable conditions

After with stable conditions

JMT designed and permitted the first stream and floodplain restoration project to meet stormwater quantity peak reduction requirements in Maryland.

This additionally provided stormwater water quality benefits for redevelopment areas of the I-270 Watkins Mill Road extension project. JMT used the "Accounting of Stormwater Wasteload Allocations and Impervious Acres Treated" Guidance Manual for National Pollutant Discharge Elimination Systems for Stormwater as part of its design, along with a robust stream and floodplain restoration design methodology.

This project, which will restore more than 5,200 feet of stream, also fulfills the compensatory mitigation requirements of unavoidable impacts to waters of the United States associated with the roadway project. JMT conducted an in-depth, multidisciplinary assessment to support the design. Geomorphic assessments included reviews of previously conducted studies, natural resource inventories, historic investigation, hydrologic and hydraulic (H/H) analysis, streambank sediment and soil studies, and sediment mobility studies.

This geomorphic data analysis helped develop an understanding of the existing impacts within the stream corridor, current geomorphic processes, and causes of instability. JMT's design re-establishes a restored floodplain elevation that will correspond closely to the elevation of the historic floodplain valley bottom, which existed prior to damming, deforestation, and associated sedimentation following European settlement of the region. Multiple benefits will be realized by reconnecting the proposed streambed to the basal gravels of the historic floodplain and providing a permeable layer in a well-connected floodplain. This includes flood flow attenuation, improved hyporheic exchange, wetland restoration, and functional uplift of stream and wetland habitats.

To expedite permitting, JMT worked closely with state and federal regulatory agencies to address permitting issues and obligations, integrating a diverse array of agency comments into the final design. JMT developed a diverse design alternatives analysis to demonstrate the final design as the preferred alternative, achieving the greatest functional uplift with appropriate avoidance, minimization, and mitigation measures addressing resource impacts on the site. Such measures included the re-use of woody vegetation as an integral habitat substrate of the restoration, providing wetland texture, stream grade control, and providing enhanced denitrification biochemical benefits in the hyporheic zone.

As a result of the project, JMT assisted MDOT SHA in meeting the following goals:

- Extensive reduction of sediment and nutrient pollution, contributing towards meeting TMDL goals for the watershed, and helping meet stormwater quality requirements for the redevelopment of I-270.
- Addressing stormwater management quantity requirements in the floodplain, simultaneously meeting compensatory mitigation requirements on-site.
- A demonstrable lift of the existing ecological functions and values of the wetland and stream resources on the project site.

In Progress

Font Hill Tributary Stream Restoration

Howard County, MD

Project Highlights

- 1.97 square mile drainage area classified as use IV-P (recreational trout waters and public water supply).
- Reduces more than 2,714,205 lbs. per year of total suspended sediment.
- Reconnects to the water table allowing for the creation of varied hydrologic conditions by manipulating floodplain topography to support diverse wetland communities.
- Reestablishes natural riparian corridor using native materials found on-site, reducing the use of imported materials or hard armoring structures

JMT's design strategy for Font Hill Tributary was to restore a native valley bottom ecosystem without the need to import large quantities of rock or other unnatural materials. By minimizing imported materials and using salvaged material, JMT was able to cut construction/hauling costs. In addition, this project also involved natural resource investigations and regulatory permitting for this 6,000 LF design-build stream and floodplain restoration project.

One goal of the project was to reestablish a pre-settlement valley bottom ecosystem, creating more than 11 acres of floodplain wetlands. The restoration was designed to remain stable through the entire hydrograph, using native wetland vegetation and the native basal gravel layer of the streambed. JMT's strategy focused on the conversion of highly incised stream and impaired existing resources to a low energy, stable flow regime system. The design creates an environmentally diverse and self-sustaining ecosystem.

Instream and floodplain structures consist of features made primarily from wood, including in-stream buried logs, floodplain log sills, and live fascine bundles on the outside of meander bends. Logs within the stream channel were placed flush with the proposed streambed elevation and buried a minimum of five feet under the streambanks. The in-stream buried logs provide grade control of the proposed stream bed. Floodplain log sills and additional woody debris were used within the proposed floodplain to create habitat features and provide carbon into the system.

During construction

In Progress

Eccleston, Patuxent & Wye Mitigation Projects

Baltimore, Howard & Talbot Counties, MD

Eccleston Project Highlights

- Restores historic brown trout fishery.
- 10,604 stream credits created.
- 14.5 wetland credits created.

Patuxent Project Highlights

- 10,400 stream credits.
- 34.0 wetland credits.
- Removes dam.

Wye Project Highlights

- Creates 38 acres of forested wetland.
- Restores habitat for Delmarva fox squirrel.
- Eliminates "resource gap" between two high-quality forested wetlands.

Eccleston Mitigation Project

Eccleston Mitigation Project

Wye Mitigation Project

JMT is currently developing three turn-key mitigation projects in Maryland: the Patuxent (Howard County), Eccleston (Baltimore County), and Wye mitigation projects (Talbot County).

Each of these sites were identified with JMT's proprietary remote sensing and GIS tool. Once selected, sites were secured with a conservation easement from the landowner. These three projects are currently under development by JMT's robust team of ecological restoration designers. Following design, JMT will finalize permitting and will procure and oversee the construction of the projects. Additional services on the sites will include baseline data collection (natural resources inventories of wetlands, waterways, and forests), geomorphic surveys and assessment, topographic and boundary survey, landscape design, credit calculations, and long-term performance criteria monitoring.

Eccleston Mitigation Project (Baltimore County)

This mitigation site will preserve, enhance, and restore wetlands and streams for a total of approximately 10,604 stream credits and approximately 14.5 wetland credits of various cowardin type. The principle goals of the project site include the restoration and stabilization of the brown trout fishery on the Upper Jones Falls. Approximately 30 years of data have identified that brown trout are decreasing in numbers as the water temperature warms. Additionally, emerald ash borer has destroyed much of the canopy on which the stream reach depends for thermal regulation. JMT identified trends in the fishery and set forth a baseline monitoring plan which, when concluded, will have more than 13 years of baseline data for the project reach, including benthic macroinvertebrates, fisheries, thermal, and geomorphic data. This project site will have some of the highest top-tier biological goals of any site proposed in Maryland.

Patuxent Mitigation Project (Howard County)

The principle goals of the project site include the restoration, enhancement, and preservation of Cabin Branch, its tributaries, and adjacent floodplain wetlands. Once completed, this project will generate 10,400 stream credits and 34.0 wetland credits that are predominantly forest floodplain wetlands. In multiple locations on site, a buried hydric soil layer is present along buried cellulous material, such as seeds, twigs, root matter, etc. This indicates that the site is impacted by mill dams and legacy sediments. It is known that multiple dams were located immediately downstream of the site and at least one suspected dam is still present within the study area. Therefore, historic impacts to wetlands are present on the project site, and its restoration is possible as part of this project. This would convert upland areas to wetland areas through connection with hydric soil, connection with groundwater, and planting of hydrophytic vegetation. This site has been targeted for its potential to restore cold water fisheries species through the restoration of the channel and associated habitats. The initial investigation of the site, the analysis of preliminary thermal data, and its given use class would indicate a high potential for the restoration of these features. Other potential work includes: the grading of banks and connection of the stream to restored wetlands; the forming and maintaining of pool, riffle, glide, and run facet features; the preservation of grade control to prevent head cutting through the system; and the creation of side channel habitats.

Wye Mitigation Project (Talbot County)

The Wye Mitigation project is a mitigation banking project with stream and wetland credits that will be available for unavoidable impacts to existing resources in multiple counties on the eastern shore. This mitigation site will create approximately 38 acres of high-quality forested wetlands as well as restore drainage ditches into coastal plain streams, converting an approximately 58-acre site into a mosaic of wetlands, forests, and streams. This site has abundant hydrology and strongly hydric soils, making it an ideal candidate for restoration. The principle goals of the project include the restoration of uncommon hydrophytic oak wetland communities, similar to those located near the site. Cherrybark oak and swamp chestnut oak are key restoration species at the site, as well as providing habitat for Delmarva fox squirrel, found nearby.

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