WILDLANDS
ENGINEERING

June 23, 2023

Michael S. Huffman, CSM
Stormwater Division Manager
*Submitted via email to mhuffman@hvlnc.gov*

RE: Statement of Qualifications (SOQ) in response to the City of Hendersonville Lower Mud Creek Floodplain Restoration and Flood Risk Reduction Project
RFQ #230067555001

Dear Mr. Huffman,

Wildlands is proposing to partner with Kee Mapping & Surveying, WithersRavenel, ClearWater Environmental Consultants, Traffic Planning & Design, and Ecoforesters to provide a well-equipped project team to execute the Lower Mud Creek Floodplain Restoration and Flood Risk Reduction Project in partnership with the City of Hendersonville (City). The project team has a robust suite of expertise and project site and corridor familiarity, and we are collectively excited about this opportunity to build upon our prior and on-going partnerships with the City in implementing the suite of activities proposed by the two grants.

Wildlands previously led the Multi-Area Streambank Restoration (MASR) project for the City, a successful North Carolina Division of Water Infrastructure (DWI)-funded green infrastructure effort with innovative stormwater, stream, wetland, floodplain, riparian and flood reduction benefits requiring state and federal permitting, contracting and grant milestone and reporting coordination. Wildlands also led the NC Land and Water Fund planning grant (2021-2023) that studied the Lower Mud Creek project corridor and developed the preliminary design vision for the current project. With a wealth of prior experience on comparable restoration projects, a thorough understanding of this project, and excellent relationship with City staff and stakeholders, Wildlands is uniquely equipped to meet the challenges of and capitalize on the opportunities presented by this project.

Based on the DWI grant deadlines, we are proposing an aggressive start to the project with multiple efforts running in parallel during the assessment and survey phase of the project. Our partners will add capacity and expertise in successfully completing this task. While assessment and survey are underway, will collaborate with the City to lay the framework for a successful project that puts ecological restoration, stormwater and floodplain management at the heart of this evolving corridor. Our approach will use City and stakeholder input to stitch together sites and plans around a unified vision for a healthy community and environment. We view clear, early and on-going communication with the City and grantors as keys to successful project delivery, along with close tracking of design and construction phase budget.

The Wildlands Team is committed to the City, its residents, and to positive environmental and social outcomes from this project. We offer a wealth of applicable experience and project-specific understanding to ensure your project's success. We appreciate this opportunity to join with the City in developing a thriving ecosystem.

Sincerely,

**Shawn Wilkerson**, *CEO*
swilkerson@wildlandseng.com; (704) 332-7754

**Jake McLean**, PE, CFM
*Senior Water Resources Engineer, Project Manager*
jmclean@wildlandseng.com; (828) 545-3865

## 1.0 Firm Profile Information

Wildlands Engineering (Wildlands) will lead the team and provide full-service water resources planning and engineering capabilities. As a North Carolina employee-owned and operated firm, founded and headquartered in Charlotte in 2007, we are present across the southeast with additional offices in Asheville and Raleigh, NC; Knoxville, TN; Charleton, SC; and Fairfax, VA. Wildlands specializes in complex water resources projects involving ecological restoration and infrastructure; local, state and federal permitting; and water resource enhancements for park and greenway projects in highly visible settings.

Wildlands has 89 professionals dedicated solely to environmentally-oriented water resources projects, including 15 Professional Engineers, two GIS Professionals, six Certified Floodplain Managers, three Professional Wetland Scientists, one Professional Hydrologist, one Fisheries Professional, ecologists, wetland and riparian buffer vegetation restoration experts.

**FIRM INFORMATION**

**Name**:
Wildlands Engineering, Inc.

**NC Engineering Firm License**:
F-0831

**Principal Office Where Work Will Be Performed**:
167-B Haywood Road,
Asheville, NC 28806

**Phone, Website, Email:**
(828) 774-5547,
www.wildlandseng.com,
jmclean@wildlandseng.com

**Primary Contact & Project Manager:** Jake McLean,
(828) 545-3865,
jmclean@wildlandseng.com

As detailed in the following sections, our staff have extensive experience assessing and designing streams, wetlands, riparian resources and stormwater and flood mitigation projects in urban stream corridors using our understanding of resource management, municipal infrastructure and ecological restoration techniques. Our staff are working on the state's floodplain resiliency template as the lead for nature-based solutions, comparable large stream-stormwater-wetland-floodplain restoration projects in Durham and Morganton, and we have dozens of recently completed stream, wetland, floodplain and stormwater management projects. Comparable projects, highlighting work for municipal entities, but also projects with unique applicability, are presented in Section 2.5.

We have organized a team of local partners that will match our commitment to this project and bring parallel excellence within their respective disciplines. In addition, we have structured the team to efficiently and effectively deliver the project on schedule, within the budget, and in accordance with all grant requirements.

**PROJECT TEAM:**

| | |
|---|---|
| Kee Mapping & Surveying | **Kee Mapping & Surveying** (Kee) and Wildlands have worked together on numerous ecological restoration projects where Kee provided all surveying components from initial conditions and topographic surveys to boundary and easement recordation, construction stake-out, and as-built survey.<br>**Services**: Topographic and Boundary Surveying \| **Location**: Asheville, NC |
| WithersRavenel | **WithersRavenel** (WR) provides traditional stormwater, infrastructure design and surveying services as well as grant management to municipalities across North Carolina. WithersRavenel has worked with the City of Hendersonville on their stormwater database and condition assessments. \| **Services**: Boundary Surveying; Stormwater Structure Survey & Evaluation; Utility Engineering; and Peer Review \| **Location**: Asheville, NC |
| ClearWater | **ClearWater Environmental Consultants** (ClearWater) has served the Hendersonville area since 2002 and provides expert permitting services for a variety of public, private, and non-profit clients. Their expertise includes stream and wetland delineations, threatened and endangered species surveys, and NEPA/SEPA Environmental Assessments. ClearWater will support Wildlands' 401/404 permitting effforts.<br>**Services**: Jurisdictional Determinations, T&E Species \| **Location**: Hendersonville, NC |
| TPD | **Traffic Planning & Design** (TPD) is an accomplished East Coast multi-disciplinary A/E/C firm that leverages its local knowledge and focus on staff excellence to provide sustainable solutions. TPD is currently engaged on the Above the Mud project with physical project overlap on the Brevard Church and acquisition sites. They will apply their expertise in greenways and passive park design to support long-term corridor objectives in the context of this project. \| **Services**: Park & Greenway Planning \| **Location**: Asheville, NC |
| EcoForesters | **Ecoforesters** (EF) and Wildlands have worked together on numerous ecological restoration projects where Wildlands prepares treatment plans that are implemented by EF field staff.<br>**Services**: Invasives Management \| **Location**: Asheville, NC |

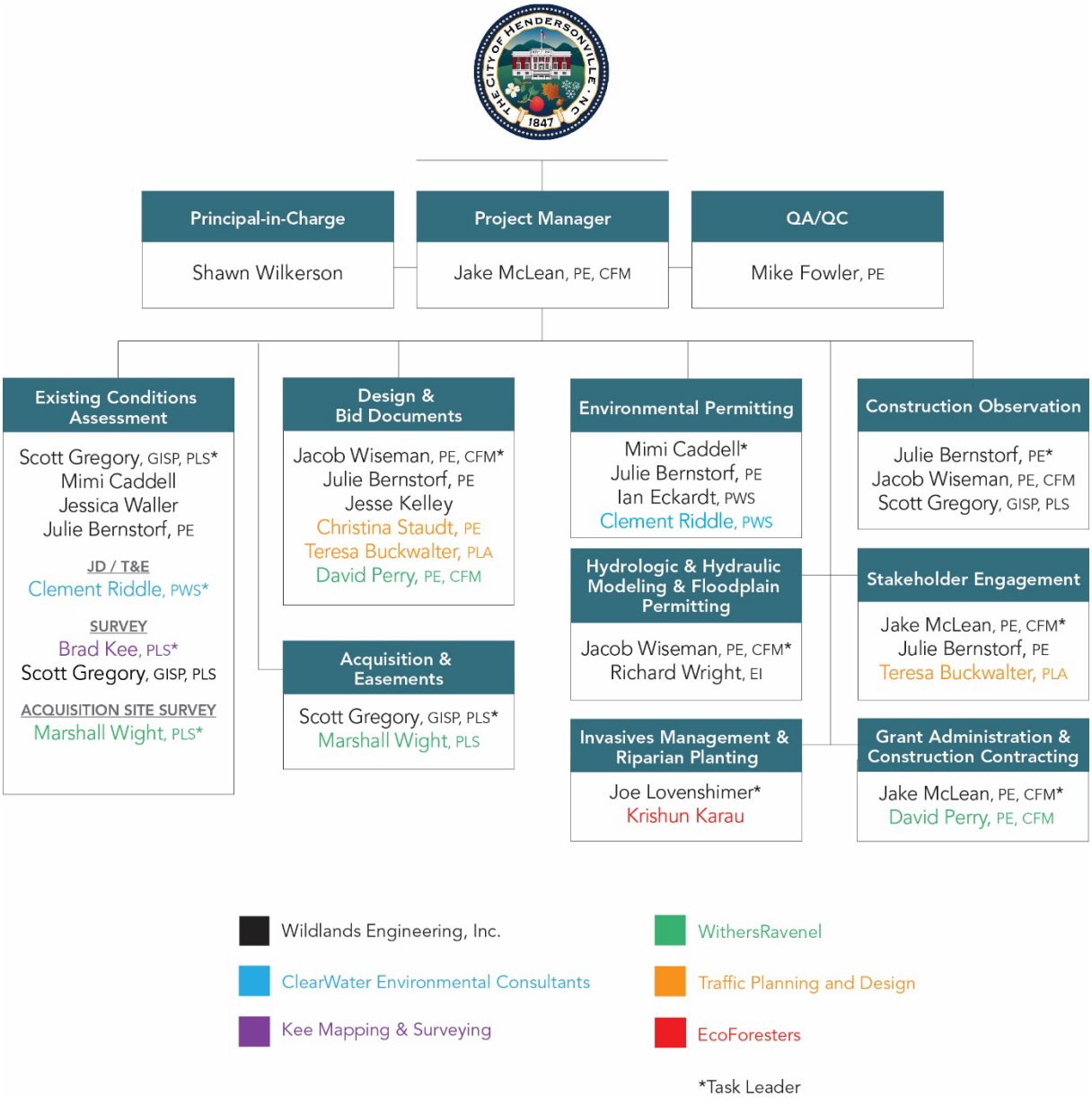
## 2.0 Proposed Project Team Qualifications

### 2.1 Organizational Chart

The Wildlands Team is equipped with the best combination of experience and technical expertise to take on the Lower Mud Creek Floodplain Restoration and Flood Risk Reduction project. Our team members have worked together on a variety of projects and based on our past working relationships, we are confident that we can serve the City and the environment well.

ClearWater will add capacity and local knowledge in completing jurisdictional and environmental assessments, surveyors from Kee will conduct topographic survey of Wilson and Brevard Church sites while surveyors from WR will complete acquisition site survey needs. Design professionals from WR and TPD are familiar with greenway and stormwater infrastructure in the corridor and will assist with evaluation of stormwater and transportation infrastructure to make recommendations to facilitate design work with an understanding of other on-going and future needs.

The following organizational chart illustrates our multi-disciplinary group of professionals that comprise the Wildlands Team.



## 2.2 Resumes of Staff Members

### Shawn Wilkerson

*CEO*

**Project Role:** Principal-in-Charge
**Years at Wildlands:** 16 years

MSE, Civil Engineering, University of North Carolina at Charlotte, 1998
BA, English Literature, Appalachian State University, 1993

Mr. Wilkerson has 23 years of professional experience in water resources, focusing on surface water hydrology and restoration. He has managed and designed a diverse range of projects, including wetland/BMP construction and monitoring, stream restoration and enhancement, and watershed planning for flood control and water quality improvements. As a licensed NC Real Estate Broker, Mr. Wilkerson plays a key role in initial site evaluation for mitigation and conservation easement acquisition. Several of his key projects have involved turnkey mitigation solutions. In his role at Wildlands, he also serves as the leader of an 89-person team of scientists and engineers that focuses on ecological restoration. Mr. Wilkerson focuses on integrating ecologically responsible projects within the constraints of impacted landscapes while using his experience and education to manage and create innovative and successful projects.

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Principal-in-Charge

**Richland Creek Water Quality Improvement Projects** | City of Greenville, *Greenville, SC* | Principal-in-Charge

**Chantilly Ecological Sanctuary at Briar Creek** | MCSWS, *Charlotte, NC* | Principal-in-Charge

**Azalea Park Pond Improvement Project** | City of Asheville Parks & Recreation, *Asheville, NC* | Principal-in-Charge

**McClures Bog Hydrologic Restoration** | The Nature Conservancy, *Etowah, NC* | Principal-in-Charge

### Mike Fowler, PE

*Senior Project Manager*

**Project Role:** QA/QC
**Years at Wildlands:** 10 years

MS, Environmental Engineering Sciences, University of Florida, 1991
BS, Civil Engineering, Virginia Polytechnic Institute and State University, 1987

Mr. Fowler has over 27 years of experience in watershed planning, stormwater management, stream and wetland restoration, and design of stormwater management systems. He serves as a senior project manager and technical advisor for watershed planning, stormwater management, and ecological restoration projects within the firm.

**South Ellerbe Stormwater Restoration Project** | City of Durham Public Works, *Durham, NC* | Project Manager; Grant Administration

**Chantilly Ecological Sanctuary at Briar Creek** | MCSWS, *Charlotte, NC* | QA/QC

### Jake McLean, PE, CFM

*Senior Water Resources Engineer*

**Project Role:** Project Manager, Grant Administration & Construction Contracting, Stakeholder Engagement
**Years at Wildlands:** 9 years

MS, Civil Engineering, Auburn University, 2002
BS, Civil Engineering, Auburn University, 2000

Mr. McLean has 21 years of experience in leading, planning and designing ecologically-focused stream and wetland restoration, stormwater, floodplain restoration, flood reduction and mitigation, aquatic passage and recreational infrastructure and access projects in a variety of land use and landscape settings, extensively in Western North Carolina. He has worked on dozens of state and federally-funded grant projects involving water resources and recreational access for municipal, non-profit and federal clients. Mr. McLean has extensive experience with projects involving complex hydraulic, hydrologic and sediment transport considerations and urban constraints. At Wildlands, he is responsible for project management, oversight and design of watershed and water resource planning and design projects, floodplain and flood modeling.

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Project Manager; Designer; Hydraulic Modeling and Floodplain Permitting

**Richland Creek Water Quality Improvement Projects** | City of Greenville, *Greenville, SC* | Lead Designer; Floodplain Modeling; Construction Oversight

**Azalea Park Pond Improvement Project** | City of Asheville Parks & Recreation, *Asheville, NC* | Project Manager

**Chantilly Ecological Sanctuary at Briar Creek** | MCSWS, *Charlotte, NC* | Design Reviewer

**McClures Bog Hydrologic Restoration** | The Nature Conservancy, *Etowah, NC* | Project Manager

### Scott Gregory, GISP, PLS

*Senior Environmental Scientist*

**Project Role:** Existing Conditions Assessment, Survey/Data Coordination, Acquisition and Easements; Construction Administration

**Years at Wildlands:** 10 years

MS, Earth Science, University of North Carolina at Charlotte, 2004

BS, Biology with a Minor in Geography/Chemistry, Radford University, 1995

Mr. Gregory is a senior environmental scientist in the Asheville, NC office and is the leader of Wildlands' GIS and geospatial technology group. He has 20 years of experience in GIS, watershed and stormwater management planning, and natural channel design. He specializes in mapping, 3D spatial analysis and modeling using GIS to provide spatial decision support solutions for a wide variety of water resource, ecological restoration, and environmental planning projects. His experience includes surveying and GPS, easements, construction oversight, and the deployment of mobile and web-based mapping applications using ArcGIS Online (AGOL). Mr. Gregory has assessed over 130 miles of streams in North Carolina and been instrumental in developing watershed/water quality improvement plans and natural channel design approaches for numerous urban and rural watershed and stream projects.

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Stream Assessment; Design/Planning; Permitting; Easements; ArcGIS Applications; Construction Administration

**Richland Creek Water Quality Improvement Projects** | City of Greenville, *Greenville, SC* | Construction Administration

**McClures Bog Hydrologic Restoration** | The Nature Conservancy, *Etowah, NC* | GIS Mapping; Stakeholder Graphics; Construction Administration Support

**Mouth of Mud Floodplain Restoration Planning Study** | Conserving Carolina, *Henderson County, NC* | GIS Mapping; Assessment and Design Planning

### Jessica Waller

*Environmental Scientist*

**Project Role:** Existing Conditions Assessment

**Years at Wildlands:** 2 years

MS, Forest Resources, Clemson University, 2021

BS, Natural Resource Ecology and Management: Conservation Biology, Louisiana State University, 2015

Ms. Waller currently serves in the Wildlands Asheville office as an environmental scientist. Ms. Waller has a combined six years of post-graduate professional and academic experience in the natural resources field. She has worked extensively in coastal cypress swamps, bottomland hardwood forests, and tidal estuarine/marsh environments and is experienced in wetland assessment, permitting, and mitigation.

**Shake Rag Mitigation Site** | NCDMS, *Henderson County, NC* | T&E Survey; Monitoring

**Banner Farm Mitigation Site** | NCDMS, *Henderson County, NC* | Existing Conditions Assessment

**Henry Fork Mitigation Site** | NCDMS, *Catawba County, NC* | Post-Construction Monitoring

### Mimi Caddell

*Environmental Scientist*

**Project Role:** Existing Conditions Assessment, Environmental Permitting (Lead)

**Years at Wildlands:** 6 years

BS, Environmental Science, UNC Chapel Hill, 2014

Ms. Caddell has eight years of watershed resources experience and leads the assessment and monitoring team in the Asheville Office. She has experience with geomorphic and vegetation assessments, stream and wetland jurisdictional determinations, site evaluation for stream, wetland and floodplain restoration, stream and wetland gaging studies, watershed planning studies and permitting. She has led community volunteer groups and educational programs. Ms. Caddell's duties at Wildlands include environmental assessement, T&E species evaluation, stream and wetland delineation, vegetation and geomorphic assessments, data processing and GIS mapping, permitting, site stewardship, and maintenance**.**

**Chantilly Ecological Sanctuary at Briar Creek** | MCSWS, *Charlotte, NC* | Vegetation Assessment

**Banner Farm Mitigation Site** | NCDMS, *Henderson County, NC* | Assessment; Permitting

**Henry Fork Mitigation Site** | NCDMS, *Catawba County, NC* | Assessment; Post-Construction Monitoring

**Ward Mill Dam Removal** | Blue Ridge RC&D, *Watauga County, NC* | T&E Survey; Assessment; Permitting

### Joe Lovenshimer

*Adaptive Management Specialist*

**Project Role:** Invasives Management and Riparian Planting

**Years at Wildlands:** 5 years

MS, Biology, Ecology Concentration, Appalachian State University, 2016

BS, Biology, Brevard College, 2011

Mr. Lovenshimer has 10 years of professional experience related to water resources, restoration ecology, and land management. He has worked with large-scale riparian and upland restoration projects and managed monitoring projects on conserved land. His experience includes invasive plant control, maintenance of restoration plantings, vegetation surveys, and monitoring projects for annual reports. His duties at Wildlands include site stabilization, invasive plant control, vegetation planning, coordinating planting projects, stream bank repair, and monitoring projects.

**Azalea Park Pond Improvement Project** | City of Asheville Parks & Recreation, *Asheville, NC* | Vegetation Assessment

**South Ellerbe Stormwater Restoration Project** | City of Durham Public Works, *Durham, NC* | Planting Design Plan

**McClures Bog Hydrologic Restoration** | The Nature Conservancy, *Etowah, NC* | Vegetation Assessment

**Banner Farm Mitigation Site** | NCDMS, *Henderson County, NC* | Planting Design Plan; Invasive Species Control

### Julie Bernstorf, PE

*Water Resources Engineer*

**Project Role:** Existing Conditions Assessment, Design and Erosion Control, Construction Observation, Stakeholder Engagement

**Years at Wildlands:** 1 year

BS, Biological Engineering, North Carolina State University, 2016

Ms. Bernstorf serves as a water resources engineer for Wildlands in the Asheville, NC office. She has experience in stream and wetland restoration, green infrastructure, erosion and sediment control, and environmental remediation. Ms. Bernstorf's duties include collaborating with teams to implement comprehensive stream and wetland restoration projects including assessment, design, modeling, construction plans and specs, erosion control plans, and construction oversight.

**Cornbread Valley Mitigation Site** | NCDMS, *Macon County, NC* | Design and Erosion Control; 401/404 Permitting

**Southside Stormwater Enhancement** | Riverlink, *Asheville, NC* | Construction Management

**Armstrong Ford Dam Removal Feasibility Study** | Catawba Riverkeeper, *Gaston County, NC* | Design; Public Engagement; Technical Writing

**Fortune Stream Restoration** | Buncombe SWCD, *Buncombe County, NC* |Design, Permitting, Construction Management

### Jacob Wiseman, PE, CFM

*Water Resources Engineer*

**Project Role:** Design and Bid Documents (Lead), Modeling & Floodplain Permitting (Lead), Construction Observation

**Years at Wildlands:** 7 years

MS, Biological and Agricultural Engineering, North Carolina State University, 2011

BS, Biological and Agricultural Engineering, North Carolina State University, 2008

Mr. Wiseman currently serves as an engineer and project manager in the Wildlands Asheville, NC office. He has nine years of experience in hydrologic and hydraulic modeling including two dimensional modeling, stream and wetland design, and has an extensive background in erosion control and stormwater management. As a lead designer, Mr. Wiseman assists with planning, hydrologic and hydraulic modeling, design, and monitoring of ecological restoration and stormwater projects.

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Design; Streambank Restoration; Permitting

**Banner Farm Mitigation Site** | NCDMS, *Henderson County, NC* | Project Manager; Stream, Floodplain and Wetland Design; Modeling

**Richland Creek Water Quality Improvement Projects** | City of Greenville, *Greenville, SC* | Design; Site Assessment and Survey; Construction Documents

**Britton Creek** | City of Hendersonville, *Henderson, NC* | Construction Observation

### Jesse Kelley

*Senior Environmental Designer*

**Project Role:** Construction Documents

**Years at Wildlands:** 14 years

BS, English, New Mexico State University, 1996

Mr. Kelley has over 20 years of experience dealing with AutoCAD/Civil 3D in civil design, surveying, and mechanical design. His survey experience has involved collecting data in the field, transferring it to AutoCAD, preparing surfaces, creating project base files, project

design, construction staking, and construction management. His civil design experience ranges from stream and wetland restoration design to civil infrastructure design for master planned residential and commercial projects. Stream and restoration design included existing conditions survey and base map preparation, existing and proposed stream alignments, erosion control structures and BMPs, earthwork balancing, as-built plans, and habitat and planting design. Infrastructure design involved preparation of proposed grading, erosion control and water quality design, storm water drainage, potable water design, sewer design, roadway design, construction management, and project coordination with clients, designers, and multiple jurisdictions and utilities.

**Reedy Creek Design-Build Stream Restoration Project** | CMSWS, *Charlotte, NC* | Existing Conditions Assessment; Design; Plan Production

**Chantilly Ecological Sanctuary at Briar Creek** | CMSWS, *Charlotte, NC* | Existing Conditions Assessment; CADD Design; Grading and Plan Production

**Richland Creek Water Quality Improvement Projects** | City of Greenville, *Greenville, SC* | CADD Design; Surface Modeling

**Torrence Creek at Huntersville Business Park Stream & Water Quality Enhancement – Phase I** | CMSWS, *Huntersville, NC* | CADD Design Support; Surface Modeling; Construction Administration

### Ian Eckardt, PWS

*Senior Environmental Scientist*
**Project Role:** Permitting Oversight/Review
**Years at Wildlands:** 10 years

MS, Earth Science, North Carolina State University, 2007
BS, Geology, North Carolina State University, 2001

Mr. Eckardt has 16 years of experience in stream geomorphic assessments, stream classification, wetland delineation, protected species surveys, sediment sampling and analysis, water quality monitoring, groundwater monitoring, surveying, and vegetation assessment. As a senior staff member, he assists with training and oversight of junior staff and review of regulatory permitting submittals, agency correspondence, delineations, assessment, T&E surveys, and post-construction monitoring work and continues to also perform these tasks himself.

**South Ellerbe Stormwater Restoration Project** | City of Durham Public Works, *Durham, NC* | Wetland Delineation; Permitting

**Chantilly Ecological Sanctuary at Briar Creek** | MCSWS, *Charlotte, NC* | Jurisdictional Determination; 401/404 Permitting

**McClures Bog Hydrologic Restoration** | The Nature Conservancy, *Etowah, NC* | Permitting

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Permitting

### Richard Wright, EI

*Environmental Designer*
**Project Role:** Hydro Design and Floodplain Permitting
**Years at Wildlands:** 2 years

BS, Biological Engineering, Ecological Engineering Concentration, North Carolina State University, 2019

Mr. Wright has four years of experience in water resources engineering and ecological restoration. He currently serves as an Environmental Designer for Wildlands' Knoxville, TN office. Mr. Wright has experience working on a variety of public and private projects including stream and wetland restoration, stormwater management, erosion and sediment control, and hydrologic and hydraulic modeling, including 2-D hydraulic modeling. His responsibilities include site analysis, report preparation, stream and wetland design, modeling, permitting, and construction administration.

**South Ellerbe Stormwater Restoration Project** | City of Durham Public Works, *Durham, NC* | Existing Conditions Assessment

**Dynamite Creek Mitigation Site** | NCDMS, *Rockingham County, NC* | FEMA Flood Study; Permitting

**Liberty Rock Mitigation Site** | NCDMS, *Liberty, NC* | FEMA Flood Study; Permitting

### Christina Staudt, PE

*NC Regional Manager*
**Project Role:** Greenway Plan/Design
**Years at TPD:** 23 years

BS, Civil Engineering Systems, University of Pennsylvania, 1998

Ms. Staudt is a senior project manager for public sector design and planning projects. She approaches projects with an eye on context sensitivity and awareness of mobility needs for all users. Her experience ranges from project planning and grant writing to conceptual, preliminary, and final design. Ms. Staudt has also provided project oversight through bidding and construction inspection. She has reviewed hundreds of land development and transportation improvement plans including corridor

studies, access plans, traffic impact studies, internal circulation, roadway safety reviews, traffic calming, municipal consulting, MUTCD compliance and ADA compliance reviews. Ms. Staudt's experience also includes extensive public involvement outreach.

**Ecusta Rail Trail** | Henderson County, *Hendersonville, NC* | Project Management; Planning; Engineering; Conceptual Plan Development

**Karen Cragnolin Park Greenway** | River Link, Inc., *Asheville, NC* | Drainage Design; Floodplain Analysis; Line and Trail Work Grading

**Swannanoa River Greenway (Fonta Flora Trail) Feasibility Studies and 65% Design** | City of Asheville, *Asheville, NC* | Road/Bridge Network Evaluation/Design; Trail/Road Crossing and Safety Recommendations; Stakeholder Outreach; Cost Estimating

**OLLE Art Walk (Old Lenoir Walk Multi-Use Trail)** | City of Hickory, *Hickory, NC* | Traffic Analysis; Community Engagement; Crossing Evaluation; Design; Cost Estimating

### Teresa Buckwalter, PLA

*Multimodal Transportation Planner*
**Project Role:** Park and Greenway Plan/Design, Stakeholder Engagement
**Years at TPD:** 1 year

MLA, Landscape Architecture, University of Michigan, 2001
BS, Natural Resource-Based Recreation Management, Michigan State University, 1993

Ms. Buckwalter is a registered landscape architect in North Carolina and Virginia. Combining landscape architecture, community and land planning, Ms. Buckwalter brings a 20-year track record of project management of public projects. She has helped communities throughout Western NC plan and design both engaging and functional spaces. Ms. Buckwalter has helped clients execute their vision on numerous greenway, park, and transportation projects including the Middle Fork Greenway, the Fonta Flora State Trail, and the Overmountain Victory National Historic Trail.

**Ecusta Rail Trail** | The City of Brevard, *Brevard NC* | Planning; Conceptual Plan Development

**Karen Cragnolin Park Greenway** | River Link, Inc., *Asheville, NC* | Design Compliance Standards; Erosion and Sediment Control Specifications

**NC 107 Greenway Feasibility Evaluation** | Town of Cullowhee, *Cullowhee, NC* | Community Engagement; Stakeholder Coordination

**Double Bluff Recreation Area** | Town of Jonesville, *Jonesville, NC* | Master Planning; Analysis; Design; Community Engagement

### Clement Riddle, PWS

*Senior Scientist*
**Project Role:** JD/T&E, Permitting
**Years at ClearWater:** 21 years

MS, Planning, University of Virginia, 1998
BS, Natural Resources, University of the South, 1991

Mr. Riddle has over 32 years of experience with wetland permitting, environmental planning, and natural resource studies in North Carolina. He oversees all environmental projects and serves as the principal for large and technical permitting projects. Ongoing representative projects include mitigation design and monitoring, 404 permitting for golf courses, master-planned communities, retail shopping malls, industrial developments, and environmental assessments for NEPA/SEPA compliance. He has extensive experience managing wetland/stream permitting and has worked extensively with the USACE, Wilmington District, and NCDENR.

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Permitting

**City of Hendersonville Water Intake** | Hendersonville Sewer and Water, *Hendersonville, NC* | Stream delineation; Permitting

### Brad Kee, PLS, CFS

*Professional Surveyor*
**Project Role:** Survey
**Years at Kee:** 20 years

BS, Geography, GIS Concentration, Appalachian State University, 1997

With over 20 years of experience in land surveying, Mr. Kee has been a leader in providing high quality site surveys for clients ranging from land developers to conservation agencies. Mr. Kee is experienced in geomorphic assessment surveys, conservation easement surveys, boundary surveys for property net verification, GPS control for NC State Plane survey work, easement platting, legal descriptions, and easement monumentation. For projects large and small, Kee uses the same care and integrity to achieve accurate documentation.

**Multi-area Streambank Restoration Project** | City of Hendersonville, *Hendersonville, NC* | Project Surveyor; Easement Plats

**Banner Farm Mitigation Site** | NCDMS, *Henderson County, NC* | Project Surveyor; Easement Plats

**Reedy Creek Design-Build Stream Restoration Project** | CMSWS, *Charlotte, NC* | Survey Project Manager; Topographic Survey

### Marshall Wight, PLS

*Survey Group Director*

**Project Role:** Acquisition Site Survey, Acquisition and Easements

**Years at WithersRavenel:** 8 years

BS, Agriculture Environmental Technology, North Carolina State University, 2002

Mr. Wight is a surveyor and survey project manager with a background in conventional and GPS field procedures, research, and data processing. He performs boundary topographic surveys; bathymetric surveys; boundary resolution; as-built; monitoring; planimetric and topographic mapping, recombination, right-of-way dedication, and easement mapping. Mr. Wight specializes in remote sensing technologies, including high-definition 3D laser scanning, unmanned aerial systems (UAS) legality, flight planning, 3D modeling, orthophoto/surface model generation.

**Wake County Flood Control** | Wake County, *Raleigh, NC* | Survey Manager

**Indian Creek Greenway Easement** | Town of Morrisville, *Morrisville, NC* | Project Manager

**Tryon SRF Sewer Rehab and Replacement** | Town of Tryon, *Tryon, NC* | Survey Manager

### David Perry, PE, CFM

*Senior Project Manager*

**Project Role:** Design and Bid Documents, Grant Administration and Construction Contracting

**Years at WithersRavenel:** 2 years

MS, Civil Engineering, University of North Carolina at Charlotte, 2014

BS, Civil Engineering, Carnegie Mellon University, 1997

Mr. Perry ensures stormwater infrastructure design that meets all of our clients' goals. He has more than 25 years of experience, both in the public and private sectors, including more than five years with the City of Charlotte Storm Water Services. He is responsible for overall design and project management, along with practical, cost-effective, and constructible solutions for hydraulic designs. His experience includes design of Stormwater Control Measures (SCM), stream restoration, closed systems, flood control measures, and floodplain analysis.

**Jump and Run Branch Watershed Analysis Study** | City of Salisbury, *Salisbury, NC* | Project Manager

**Mountain View Dr. Culvert Replacement** | Buncombe County, *Asheville, NC* | Project Manager

**Niblick Drive Culvert Replacement** | City of Gastonia, *Gastonia, NC* | Project Manager

### Krishun Karau

*Forest Stewardship Director*

**Project Role:** Invasives Management and Riparian Planting

**Years at EcoForesters:** 4 years

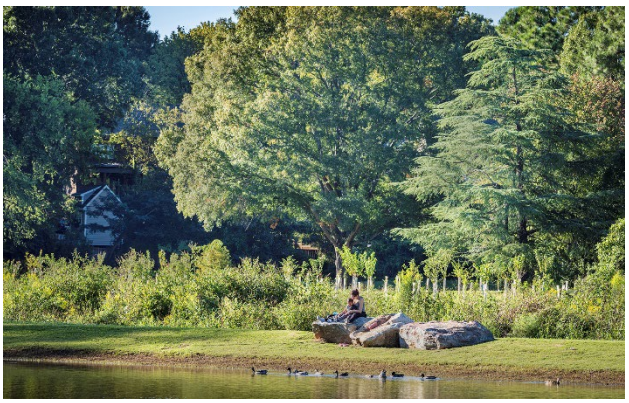
BS, Wildlife Ecology and Biology, University of Wisconsin-Stevens Point, 2012

Ms. Karau has 10 years of experience in planning and leading implementation of invasive species and forest management efforts. She leads invasive species management planning and implementation efforts on stream, wetland and floodplain mitigation sites.

**Oak Hill Dairy Mitigation Site** | NCDMS, *Cherryville, NC* | Crew Director, Invasives Treatment Implementation

**Shake Rag Mitigation Site** | NCDMS, *Madison County, NC* | Crew Director, Invasives Treatment Implementation

**Southside Stormwater Enhancement Project** | Riverlink, *Asheville, NC* | Crew Director; Invasives Treatment Implementation; Riparian Planting



*Wildlands urban stream restoration projects within natural and recreational corridors*

## 2.3 Staffing Summary and Availability

Wildlands completes workload planning for nine to twelve months in advance and has allocated the proposed project team to this project through bid and design package approval in July of 2024. Our schedule is front-loaded to allow for critical path tasks to run in parallel in the first quarter of the project and we have added both environmental assessment and survey capacity to ensure that the assessment phase of the project can proceed rapidly to facilitate the project schedule. Participating firms have reviewed the proposed project schedule and agree to provide the necessary resources to implement the project within the design budget. Partner project roles are described in Section 2.1 and individual roles are provided with resumes.

As the project manager, Mr. McLean will have 25-50% of his time allocated to this project on a quarterly basis in order to coordinate task leader activities, manage the project schedule and budget, guide and assist with design and modeling work to ensure that appropriate approaches are used for the project. Mr. McLean will coordinate reviews with QA/QC reviewer, Mike Fowler, who is working as the Project Manager on a comparable project for Durham funded by the same two grant sources. Wildlands has two other senior project managers that have been involved extensively in municipal projects of this nature in Charlotte, Morganton, Greenville, SC, and other municipalities that are available to provide review and input as requested. WithersRavenel is available for peer review of DWI and grant submittals, or comment response advice and assistance. They are going to be leading any necessary boundary survey activities on the acquisition site and are poised to assist with additional services on the acquisition site if additional design funding becomes available.

Mr. McLean will coordinate with the City through project meeting and progress updates on a biweekly or monthly basis, at the City's discretion, including periodic updates to City staff outside of the stormwater department to obtain input on project decisions affecting multiple department's long-term objectives for the sites. Progress meetings will ensure that deliverables are progressing on schedule. If a lag occurs in the design schedule, Mr. McLean will work with Wildlands leadership to evaluate and implement staffing adjustments to get back on schedule. At each stage, risks and opportunities will be evaluated internally and with the City to guide the timing and approach to key considerations. Identified approaches to risks and challenges are further discussed in Section 3.0 and highlighted in summary boxes in that section.

Mr. McLean will execute the project through Task Leaders Scott Gregory, Jacob Wiseman, Mimi Caddell and Julie Bernstorf, who will have 25-50% of their time assigned to the project on a quarterly basis to oversee their respective tasks. During periods of intensive work, time allocation is likely to be 50-75%. Staff are predominantly long-serving Wildlands Team members, highly experienced in their respective disciplines, and have served on comparable projects in similar roles before, including for the City of Hendersonville. Mr. McLean will coordinate invasive species management planning and implementation through Joe Lovenshimer who will prescribe and coordinate treatment through Ecoforesters, a local non-profit and forest management group that works extensively with Wildlands on ecological restoration work. Wildlands project and task managers will coordinate with Kee, WithersRavenel, ClearWater and TPD on topographic surveys, boundary and offsite structure surveys, jurisdictional determinations and T&E species evaluation, and park & greenway planning/design, respectively.

*Wildlands Ecological Restoration Team*

## 2.4 Delivering Services On-Time and Within Budget

Our philosophy on effective project management requires clear communication, effective task schedule management, efficient budget tracking, and adherence to our QA/QC program. Each of these components supports adherence to the overall project schedule. In addition, multiple risks have been identified and discussed in the approach section. The project manager, QA/QC manager and the City will review risks and status of risk management activities at milestone stages and at critical intermediate stages. QA/QC and peer review will also reduce permitting and review comments to keep late-stage project efforts moving according to schedule. Communication on the project will include a kickoff meeting to share project vision with Design Team and City staff, monthly project reports, meeting minutes, and agency and stakeholder discussions. Clear communication and proper follow-up documentation will help ensure that critical information is communicated and recorded.

We have developed a detailed project schedule in Section 4.0. Our project schedules are linked with company-wide weekly and quarterly workload spreadsheets, where principals and project managers can allocate resources between multiple projects. As Chief Operating Officer, Andrea Eckardt is charged with allocating resources at a company-wide level so that all projects run on schedule and budget. Our project manager meets with Andrea monthly to review upcoming staffing needs. Wildlands project managers work together to share resources during non-critical path work periods in order to get ahead of schedule to alleviate future crunch periods.

*Urban stream restoration, stormwater and flood mitigation project designed by Wildlands*

For the Lower Mud Creek project, construction grant funding is a key project cost that will be visited and revisited, early and often. Wildlands will work with internal construction specialists and estimators from our in-house construction team, as well as senior design staff to ensure that evolving construction costs are tracked and planning and design forethought is in place. Construction specialists are also able to assist during design in advising on challenging constructability and access considerations that may provide critical to a smooth-running construction phase. This approach, which will also include consideration of potential add-alternate bid items starting at the 60% phase, will reduce the risk of cost overruns and identify value engineering opportunities as appropriate in order to ensure the design is commensurate with the available project construction funding.

For our mitigation bank projects, Wildlands functions as its own client, so the importance of cost-control to project success hits home for us. Cost efficiency is at the forefront of our minds in all aspects of a project, from supplementing ground run topography with Statewide Quality Level 1 (QL1) Lidar, to tailoring designs elements to meet specific project goals and budgets, to finding clever ways to reuse onsite materials for channel stability and habitat. Our project management team is very experienced and knows how to keep a project running on budget. Quite simply, we do not let projects go over budget.

## 2.5 Prior Experience and Qualifications

Apart from prior work for Hendersonville, Wildlands is currently working on or has recently completed the following large-scale municipal stream, wetland, stormwater and flood-focused projects:

- City of Durham Stream and Stormwater Wetland (On-going and highlighted project)
- Town of Morganton Bethel Park (On-going)
- City of Greenville, SC Richland Creek Projects (Complete and highlighted project)
- Charlotte-Mecklenburg Stormwater Chantilly Ecological Sanctuary (Complete and highlighted project)
- Charlotte-Mecklenburg Stormwater Reedy Creek Preserve (Complete)

The following highlighted projects demonstrate our prior experience and qualifications for municipal and non-municipal clients on comparable projects.

# Hendersonville Multi-area Streambank Restoration Project

**Location**: Hendersonville, NC

**Owner:** City of Hendersonville

**Contact Information:**

Brent Detwiler
305 Williams Street,
Hendersonville, NC 28792
bdetwiler@hvlnc.gov,
(828) 697-3060

**Project Duration**: 2017-2021

**Project Budget**:

Engineering: $454,500
Construction: $2,240,000

**Project Staff and Role**:

Shawn Wilkerson*, Principal*

Jake McLean*, Project Management; Design; Flood Studies; Bidding; Construction Oversight*

Scott Gregory, *Field Data Collection; Permitting; Design; Construction Oversight*

Jacob Wiseman, *Design; Permitting; Flood Studies; Bidding*

Brad Kee, *Surveyor*

Clement Riddle, *Delineations, T&E*

**Project Applicability:**

| | |
|---|---|
| ✓ | Flood Mitigation, Permitting & Modeling |
| ✓ | Stream and Wetland Restoration |
| ✓ | Innovative SCM Design |
| ✓ | Hydraulic & Hydrologic Modeling / FEMA |
| ✓ | Federal & State Grant Coordination, Administration, & Closeout |
| ✓ | Federal & State Regulations |
| ✓ | Project Management |

*The project was completed within budget and schedule targets, with approved adjustments to accommodate additional activities.*

The Multi-Area Streambank Restoration Project was a City initiative to restore approximately 11,000 LF of streambanks at 13 sites throughout the City.

The project purpose was to protect sanitary sewer and other City infrastructure, as well as improve water quality in Mud Creek, an impaired stream on the state's 303(d) list, using a green infrastructure-focused approach. Grant funding through the Division of Water Infrastructure (DWI) required state review of the project bid package and the acquisition of easements on each parcel.

Wildlands collaborated with the City to select a variety of approaches to address site needs including natural channel design, buffer enhancement, stormwater retrofits, streambank restoration, and stabilization measures. Project components included site assessment, preliminary design, community outreach, project easement development, final design, permitting, construction oversight, and monitoring. The project was completed in 2021.

Wildlands used ArcGIS online and other cloud-stored data to facilitate easements, public outreach, and construction phase tracking.

As part of the project, T&E species, evaluations, and jurisdictional determinations (stream and wetland delineation) were completed. 404/401 environment permits and floodplain development permits were obtained for the majority of sites. Six flood studies and hydraulic analysis reports were completed to support floodplain development permits. An erosion control permit was also obtained for the project from NCDEQ DEMLR.

## South Ellerbe Stormwater Restoration Project

**Location**: Durham, NC

**Owner:** City of Durham Public Works, Stormwater and GIS Services

**Contact Information:**
Sandra Wilbur
101 City Hall Plaza
Durham, NC 27701
Sandra.Wilbur@durhamnc.gov
(919) 560-4326

**Project Duration**: 2017-present

**Project Budget**:
Engineering: $2.3M
Construction: $25M

**Project Staff and Role**:
Mike Fowler*, Project Management; Grant Administration*

Jesse Phillips, *Water Quality Modeling; H&H Modeling; Design; Construction Documents*

Joe Lovenshimer, *Planting Plan Design*

Ian Eckardt, *Permitting; Wetland Delineations*

Richard Wright, *Existing Conditions Assessment*

**Project Applicability:**

| | |
|---|---|
| ✓ | Flood Mitigation, Permitting & Modeling |
| ✓ | Stream and Wetland Restoration |
| ✓ | Innovative SCM Design |
| ✓ | Hydraulic & Hydrologic Modeling / FEMA |
| ✓ | Federal & State Grant Coordination, Administration, & Closeout |
| ✓ | Federal & State Regulations |
| ✓ | Project Management |

*Wildlands is finalizing bid documents. Construction is scheduled for May 2024.*

Wildlands is currently contracted by the City of Durham to complete design, permitting, and construction administration for the South Ellerbe Stormwater Restoration Project, an urban stormwater quality retrofit near downtown Durham.

Wildlands has supported the City on an extensive public outreach program that has used public meetings, a design workshop, project-related videos, public surveys, and social media (Facebook, Twitter, YouTube) to solicit input from Durham residents and key stakeholders and develop the Conceptual Design, which includes:

- Restoration of two tributaries to South Ellerbe Creek; including daylighting one 700-foot long tributary
- Creation of a 7-acre stormwater wetland with multiple terraces and vegetation communities to improve water quality in South Ellerbe Creek and ultimately in Falls Lake
- Streetscape improvements and installation of community amenities such as an expanded greenway trail, bioretention system, demonstration garden, and plazas

The project site provides a unique opportunity to provide treatment of stormwater runoff from a 585-acre highly urbanized watershed that lacks stormwater controls. The project will also assist the City to meet nutrient reduction requirements in the Falls Lake Nutrient Management Strategy.

## Richland Creek Water Quality Improvement Projects

**Location**: Greenville, SC

**Owner:** City of Greenville

**Contact Information:**

Paul Dow
206 S Main Street
Greenville, SC 29601
pdow@greenvillesc.gov,
(864) 467-4410

**Project Duration**: 2017-2021

**Project Budget**:

Engineering: $342,000
Construction: $972,000

**Project Staff and Role**:

Jacob McLean, *Design; Construction Manager*

Scott Gregory, *Assessment; Construction Oversight*

Jacob Wiseman, *Design*

**Project Applicability:**

| | |
|---|---|
| ✓ | Flood Mitigation, Permitting & Modeling |
| ✓ | Stream and Wetland Restoration |
| ✓ | Innovative SCM Design |
| ✓ | Hydraulic & Hydrologic Modeling / FEMA |
| ✓ | Federal & State Grant Coordination, Administration, & Closeout |
| ✓ | Federal & State Regulations |
| ✓ | Project Management |

*The project was completed within budget and schedule targets.*

Wildlands completed multiple stream, innovative stormwater, flood mitigation and riparian buffer restoration projects in the Richland Creek watershed, an urban tributary to the Reedy River in Greenville, SC. Projects were funded through federal grant (EPA 319), emergency repair, and floodplain mitigation funding sources.

In 2017, Wildlands designed, permitted, and oversaw construction of an emergency streambank bioengineering restoration project on a short reach of Richland Creek in Cleveland Park where bank erosion was threatening underground utilities and a parking lot. In 2018-2019, Wildlands completed design, permitting, bidding and construction oversight based on state and federal requirements for stream restoration, stormwater green infrastructure (SCMs) and riparian buffer enhancements associated with parks and greenways. Wildlands assisted the City with grant administration requirements.

During this same period, Wildlands also completed flood mitigation design and implementation oversight involving floodplain benching and grading to offset sanitary sewer construction impacts.

Wildlands completed T&E species survey, jurisdictional determination for streams and wetlands, and secured 404 & 401, floodplain development, and erosion and sediment control permits for the projects. Wildlands led bid package development, bidding, and construction oversight to meet all state and federal grant and permitting requirements. Wildlands developed an adaptive management plan for the City that identified practices and vegetation inspection and maintenance needs to improve the self-sustaining nature of the site over time.

## Chantilly Ecological Sanctuary at Briar Creek

**Location**: Charlotte, NC

**Owner**: Charlotte-Mecklenburg Storm Water Services

**Contact Information:**
Crystal Goode
2145 Suttle Avenue
Charlotte, NC 28208
crystal.goode@mecklenburgcountync.gov
(980) 314-3223

**Project Duration**: 2012-2019

**Project Budget**:
Engineering: $844,873
Construction: $4,202,185

**Project Staff and Role:**
Shawn Wilkerson, *Principal-in-Charge*

Mike Fowler, *QA/QC*

Jake McLean, *Bid Package and Design Review*

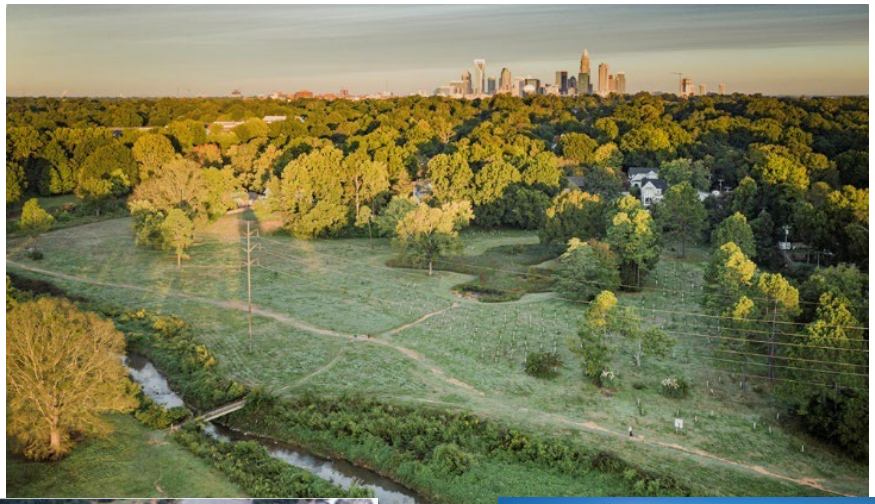
Ian Eckardt, *Permitting*

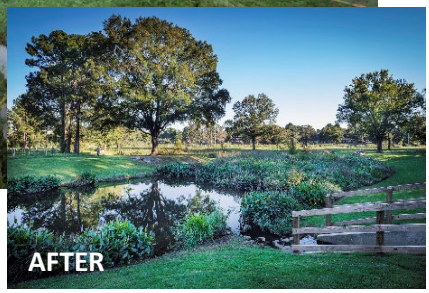
Jesse Kelley, *CADD Design, Plan Production*

**Project Applicability:**

| | |
|---|---|
| ✓ | Flood Mitigation, Permitting & Modeling |
| ✓ | Stream and Wetland Restoration |
| ✓ | Innovative SCM Design |
| ✓ | Hydraulic & Hydrologic Modeling / FEMA |
| ✓ | Federal & State Grant Coordination, Administration, & Closeout |
| ✓ | Federal & State Regulations |
| ✓ | Project Management |

*The project was completed within budget and schedule targets.*




Charlotte-Mecklenburg Storm Water Services and the City of Charlotte's Storm Water Services partnered on this stream restoration, enhancement, and stormwater quality retrofit project along Briar Creek in a densely urban area of the City of Charlotte. The overall goals of the project were to restore Briar Creek, Edwards Branch, and Chantilly Tributary, improve water quality through improved stormwater management, and obtain stream mitigation credits for the City of Charlotte's Umbrella Mitigation Bank.

Prior to the project, Mecklenburg County purchased and demolished flood-prone buildings as part of the FEMA flood mitigation buyout program. This buyout provided the space necessary to expand the existing community park, incorporate stormwater quality retrofits, and restore portions of degraded streams.

Over 4,450 LF of stream restoration and enhancement were performed, two stormwater quality BMPs were installed within the floodplain of Briar Creek, and the ground was prepared for greenway and recreational trails to be expanded in the future.

Extensive hydraulic analysis was required to support a floodplain no-rise certification. Wildlands integrated hydraulic modeling with design to avoid raising floodplain elevations on adjacent private parcels. Wildlands also prepared a feasibility study and an alternatives analysis for the Chantilly Tributary and BMP components of the project. Wildlands Realty, our sister realty firm, negotiated five donated stormwater easements on private parcels. Construction was completed in 2018.

## Azalea Park Pond Improvement

**Location**: Asheville, NC

**Owner:** City of Asheville

**Contact Information:**
Al Kopf (or Susannah Horton)
70 Court Plaza
Asheville, NC 28801
akopf@ashevillenc.gov
(828) 259-5800

**Project Duration**:
January 2021-December 2021

**Project Budget**:
Engineering: $35,850

**Project Staff and Role**:
Jake McLean, *Project Manager, Designer, H&H, Permitting*

Joe Lovenshimer, *Invasives Planning*

*The project was completed within budget and schedule targets.*

Wildlands provided assessment, planning, preliminary design, and cost estimating to rehabilitate the Azalea Park Pond outlet structure as well as park functionality. The site was hydraulically complex with multi-dimensional flow, pipe, weir and pond storage considerations. The approach considered Swannanoa River and tributary flooding regimes. Wildlands used PC-SWMM to model existing conditions and prescribe a suitable retrofit that would manage hydrology to ensure pond stability and enhance water quality objectives. Overall site design enhanced water quality, riparian and wetland habitat, park functionality, and passive use opportunities. Project solutions also mitigated private property impacts from flooding, invasive species, and met floodplain, 404/401 and local permitting requirements. Innovative design features included a beaver dam analog forebay and a parking layout retrofit to include stream restoration and stormwater concepts. Wildlands completed trail layout, passive park concepts including a boardwalk, and maintenance access design.

**Project Applicability:** *Hydrologic and Hydraulic Modeling (PC-SWMM); Park Planning; Innovative Stream Restoration and SCM Design; Local, State and Federal Permitting.*

## McClures Bog Hydrologic Restoration

**Location**: Henderson County, NC

**Owner:** The Nature Conservancy

**Contact Information:**
Adam Warwick,
46 Haywood St, Ste 222
Asheville, NC 28801
awarwick@TNC.ORG
(828) 350-1431

**Project Duration**:
2017- 2020

**Project Budget**:
Engineering: $80,000
Construction: $102,000

**Project Staff and Role**:
Jake McLean, *Project Manager, Design*

Scott Gregory, *GIS mapping*

Ian Eckardt, *Permitting*

*The project was completed within budget and schedule targets.*

Wildlands completed design-build project to manage stormwater runoff and flooding upgradient of McClure's Bog, a candidate for the Mountain Bogs National Wildlife Refuge due to its unique community of threatened and endangered species. McClure's Bog is fed by groundwater and a first order tributary draining a 26-acre subwatershed contributing flooding and nutrients to the bog. Wildlands designed an innovative stream-wetland complex with sufficient wetland storage volume to treat and infiltrate approximately 1.5" of rainfall on the watershed. Assessment efforts included groundwater and surface water gaging, soils evaluations, threatened and endangered species, invasives mapping and reference site plant surveys. With input from stakeholders, a series of tiered wetland basins was designed to divert and treat runoff from the incoming tributary while minimizing grading and disturbance to mature trees on the site. The site was treated for non-native invasive species pre-construction and planted with a diverse suite of herbaceous, shrub and tree species upon completion. Wildlands completed grant management, 3D graphic renderings in ArcGIS online, 404/401 environmental permitting, erosion control and floodplain permitting, design, and construction oversight.

**Project Applicability:** *Hydrologic Assessment; Hydraulic Modeling and Outlet Structure Design; Flood and Water Quality Mitigation; Invasives Management; Innovative Stream Restoration and SCM Design; and Local, State and Federal Permitting.*

## Karen Cragnolin Park Greenway

**Location**: City of Asheville, Buncombe County, NC

**Client:** Riverlink, Inc.

**Point of Contact:**

Lisa Raleigh, Ph.D.
170 Lyman Street
Asheville, NC 28801
828.252.8474 x 116

**Project Duration**: Design: 2022 / Construction: 2023 (Anticipated)

**Project Budget:** $58,198.75

**Key Team Members**:
Christina Staudt, *Project Lead*

Teresa Buckwalter, *Planner*

*The project is on budget and construction is scheduled for on time completion in August 2023.*

This project consisted of design, permitting, and construction management services for an important greenway section between Carrier Park and Amboy Road River Park along the French Broad River in Asheville, NC. The greenway development is a crucial missing link in this network of parks, river access sites, and trails - the first phase of the future Karen Cragnolin Park, a RiverLink project. The park is planned on a brownfield site, which has undergone a decade of remediation by RiverLink and partners.
TPD completed tasks including vertical and horizontal trail design, marking and signing plan, utility coordination, drainage and erosion & sediment control design, floodway modeling for floodplain development permit, permanent and temporary easement exhibits and property owner coordination, and NCDOT, Duke and Buncombe Metropolitan Sewerage District (MSD) project coordination and permitting. TPD also conducted construction administration.

**Project Applicability:** *Park and Greenway Planning/Design; Easement Coordination; Hydraulic & Hydrologic Modeling / FEMA.*

## Henry Fork Stream and Wetland Mitigation Site

**Location**: City of Hickory, Catawba County, NC

**Client:** NC Division of Mitigation Services

**Point of Contact:**

Matthew Reid, (828) 231-7912, matthew.reid@ncdenr.gov

**Project Duration**: 2013 - 2023

**Project Budget:** $1.8m

**Key Team Members**:
Jake McLean, *PM, Design*

Mimi Caddell, A*ssessment*

Jessica Waller, *Post-construction Monitoring*

Joe Lovenshimer, *Invasive Species Management*

Scott Gregory, *GIS mapping*

Ian Eckardt, *Permitting*

*The project was completed within budget and schedule targets.*

This project involved a 50-acre acquisition and restoration of streams, wetlands and floodplain storage on the Henry Fork River floodplain on the site of a former golf course. Historic ditching, berming and filling of streams and wetlands had resulted in impaired stream, wetland and floodplain function. The project efforts restored multiple first order tributaries and several acres of wetlands, provided over two acre-feet of new flood storage, and reestablished native riparian and wetland plant communities. The design was supported by soil and hydrology assessments, as well as hydraulic modeling to meet floodplain activation and wetland restoration targets. Ditched and altered streams and wetlands were restored to their appropriate geomorphology and location in the landscape. Wildlands identified suitable locations to dispose of thousands of yards of excess soil while maintaining construction efficiency and meeting FEMA permitting requirements. The project used on-site transplants, sod mats, and wood to enhance stream restoration efforts while minimizing the environmental footprint of the project. The project closed out in Spring, 2023, after successfully completing seven years of post-construction monitoring and invasive species management.

**Project Applicability:** *Flood Mitigation; Permitting & Modeling; Stream and Wetland restoration; Hydraulic & Hydrologic Modeling / FEMA; Federal and State Regulations; Project Management.*

## 3.0 Project Approach and Management

Our Team has crafted an approach that will provide for successful project outcomes and implementation. This approach includes: an ecological and community focus, a carefully planned schedule, deliverables driven by grant, state, and federal requirements, and a methodical and creative mindset to solving challenges, minimizing key risks and maximizing opportunities. Our primary goal is to achieve grant design deliverables on time and on budget in a manner that complements and facilitates future City greenway and open space planning within these corridors. Wildlands will follow internal QA/QC of work products and deliverables and involve senior staff working on similar municipal project and grants to provide input and ideas on the project.

Our project schedule in Section 4.0 is divided into tasks and primary subtasks, however, the following approach is divided into project phases with concurrent tasks being discussed together.

**Project Kickoff**

Wildlands proposes a 1-hour project overview to discuss the goals and deliverables of the project followed by 2-hour corridor site walk as a project kickoff activity to familiarize team members and key stakeholders with the corridor and site features. Grant concept drawings will be used for initial City and key stakeholder coordination. Required and optional design goals will be reviewed in order to guide integration of stakeholder considerations and refinement of design goals. The site walk will look at key areas of concern or that are in flux due to various on-going or future proposed private and public projects. Late July or early August is the suggested time period for the kickoff.

*Wildlands stream restoration in Greenville, SC*

**Assessment and Preliminary (30%) Design & Modeling**

Design approaches developed under the planning and grant proposal stage require additional validation and development based on in-depth and comprehensive assessment activities. These activities will include soils evaluation, topographic survey, hydraulic structure survey, jurisdictional determinations, hydrologic data collection, vegetation surveys, and engineering constraints and constructability reviews. With Wildlands' staff and the help of subconsultant team members, Kee, WithersRavenel and ClearWater, we will conduct these activities in parallel as part of an aggressive schedule for existing conditions data collection.

Hydrology data collection and hydraulic modeling are key design drivers for this project. Hydrology data will be evaluated from gages on headwater streams, Mud Creek, and floodplain wetlands located both on and adjacent to project sites. Gage data will be used to develop design storms that typify high to moderate frequency flow events that typify water quality event conditions. As part of this, rainfall totals and intensity data from the City Operations Center rain gage will be compared against NOAA Atlas 14 data to estimate rainfall frequency. High flows, land use, and climate change trends will be considered in the development of simulations. For FEMA purposes, the base flood will be the effective discharge as determined in the Flood Insurance Study.

**Assessment and 30% Design & Modeling**

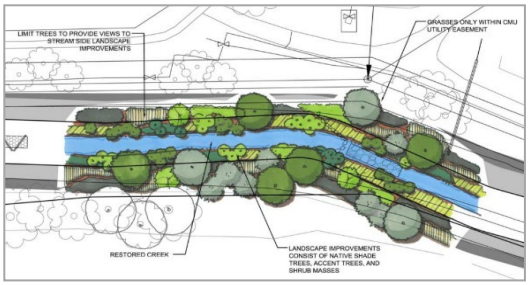
***Key Dates:*** Oct-Nov 2023: Completion of 30% design and presentation at public meeting.

***Deliverables:*** 30% Design with preliminary grading; technical memo with summary of assessment task findings; decision making rationale based on assessment; preliminary design, modeling and stakeholder engagement.

***Risks and Opportunities Addressed:*** Use subconsultants with corridor knowledge and insight to provide a well-rounded and prepared design team. Have survey and assessment teams work in parallel to provide modeling and design data at an earlier date. Develop a clear modeling protocol to guide design-model iterations and define project success metrics. Coordinate with City to secure TCE for site access for construction on Wilson Site. Evaluate earthwork balance and export if needed on both sites as major project cost. Plan and start pre-construction invasives treatment to reduce risk of spreading. Conduct discussions with City park and greenway staff to plan for accommodation of future greenway and passive recreational opportunities. Grant-phase cost estimates will be updated with more detailed estimates. Grant deliverables to be summarized and any significant changes reviewed

Detailed hydraulic modeling of existing conditions will start with existing two-dimensional (2-d) modeling from the planning phase and will be updated with topographic survey data from project sites, to be collected by Kee, and structure survey data (of offsite culverts and bridges affecting corridor hydraulics), to be collected and summarized by WithersRavenel. Modeling team members will develop site roughness values and other existing conditions model input, including preliminary processing of hydrologic data in order to prepare draft models for calibration. Another early activity will be to develop an approach and flow chart for model calibration, proposed model development, and QA/QC review.

During the 30% design phase, we will create a revised concept plan based on the initial design concepts that will synthesize the required water resource and ecological goals, grant targets, and additional planning for public access, amenities, and maintenance needs. This process will facilitate the future vision for passive recreational spaces and greenways in this corridor by accommodating these uses into the water resources design features. While there is no funding currently available to complete park and greenway design and implementation, our Project Team is well-positioned to advise on Mud Creek Greenway planning and other park considerations, ensuring our designs accommodate future park and greenway opportunities.



*Greenway and stream restoration integration*

This revised concept plan will be used during a site visit with key stakeholders proposed for late September or early October, 2023, for the purpose of soliciting feedback on future public access as well as the stated ecologic and hydrologic goals. Key stakeholders that will be involved include the Henderson Water & Sewer Department, who is completing the Mud Creek Interceptor within the corridor; Public Works for their role in Parks master planning, development and maintenance; and staff involved in greenway planning and engineering; along with other internal or external partners as identified by the Stormwater Administrator. Our Team is experienced in grant writing for parks and greenways, specifically NC's Parks and Recreation Trust Fund Grant (PARTF) and Division of Water Resources (DWR) grants. This experience will allow us to view the project so that the City can seek relevant grant funding for this project in conjunction with ongoing park master planning, if desired.

Stakeholder input will be used to prepare a 30% plan set with preliminary alignment and grading that incorporates the location of future passive uses in relationship to project activities. Feedback from the plan set and associated technical memo will guide the direction of design efforts moving into the 60% phase and beginning of proposed conditions modeling, as well as help to finalize a list of key considerations for outreach and solicitation of feedback from the general public, proposed for November. The Team will work with the City to design a method to receive public feedback, anticipated to be through a public meeting and/or online options supported by a graphic representation.

**60% Design and Modeling**

During 60% design, the Design Team will iteratively develop a grading plan and associated hydraulic model that meets target design goals and achieves a no-rise condition (FEMA). Grading will consider project construction budget limitations while seeking to achieve target DWI grant design objectives for streams, wetlands, floodplain and riparian areas, as well as NCLWF grant objectives for flood reduction. Hydraulic design will include planning for offline stormwater wetlands with stormwater volume storage, as well as simple grassed weir outlets or other hydraulic controls to enhance flood storage for low-magnitude, high-frequency storm events. The berms and weirs used in the stream-wetland complex at McClures Bog are an example of the types of structures that


*Vegetated depressional wetlands and associated weir outlets retain stormwater for water quality and flood reduction benefits at McClures Bog*

will be considered for meeting ecological, stormwater and flood reduction objectives on the Lower Mud Creek sites.

2-d modeling will compare proposed conditions to existing conditions to document project performance and FEMA no-rise. Our Team's landscape architect and greenway design staff will help define space allocation, appropriate site grading, and maintenance access considerations to allow for future passive use implementation. In this way, the site's project objectives will blend with the future park and greenway vision. Haul routes will be needed during the construction phase - the routes present an opportunity to align with future recreation uses, such as trails. These, and other site access considerations, will be finalized and temporary and/or permanent easements will be sought and obtained for construction and/or long-term access.

A planting plan will be developed with plant lists for herbaceous and woody native riparian species. Plan and profile sheets will be completed to draft stage, a refined grading plan will be developed and typical sections and project details will be drafted. A draft bid sheet and cost estimate will be prepared. Bid items will be separated by funding source and any additional clarification provided as an appendix to the 60% technical memo. As part of stakeholder outreach, Wildlands will conduct outreach to regulatory agencies to discuss the project plans at the 60% stage and determine if any concerns are present that should guide completion of the 90% design.

**60% Design and Modeling**

***Key Dates:*** Dec, 2023: Completion of 60% design and preliminary proposed modeling.

***Deliverables:*** 60% Design plan set with stream, wetland and stormwater grading and preliminary details; technical memo with summary of design approach and rationale; draft proposed condition model demonstrating no-rise and design performance; updates to project decision making rationale based on additional assessment, design, stakeholder input. Primary stakeholder and agency outreach complete.

***Risks and Opportunities Addressed:*** Follow iterative design-modeling process to validate approach with key no-rise requirement and to document performance for grant deliverables. Continue inter-department coordination and integration of future use concepts into design layout considering construction phase opportunities to use haul/access routes as future trail alignments. Develop detailed grading plan, quantities and ensure that no-rise condition and project budget are compatible. Establish refined cost estimate twelve months in advance of construction and establish clear delineation of construction pay items to provide clear separation of DWI versus NCLWF grant activities. Start to identify add-alternates that can be bid separately from base bid as a form of construction budget control.

## Acquisition and Easements

Our Team will provide acquisition support for the NCLWF acquisition parcels. Support is anticipated to involve boundary survey, potential subdivision, or recombination of parcels to separate purchase of land from structures that are currently present. The project manager will work with the City to identify temporary or permanent easement needs during the 30% and 60% design stages and will provide exhibits for necessary easements. No boundary survey work is anticipated to be required for the Wilson or Brevard Church sites. It is anticipated that a construction access easement through a private landowner will be required for the Wilson Site. On both sites, Wildlands will include NCDOT in stakeholder discussions and will determine by the 60% submittal stage what temporary encroachment agreements are required to facilitate construction activities, such as an anticipated construction entrance on South Grove Street.

**Acquisition and Easements**

***Key Dates:*** Easements for DWI must be in place prior to approval of bid and design package in July 2024. Target any temporary construction easements to be in place by Feb 2024. NCLWF acquisition easement schedule will be established with grant deadline and City input at onset of project.

***Deliverables:*** Easement exhibits, acquisition plats.

***Risks and Opportunities Addressed:*** Have separate survey team (WithersRavenel) to focus on NCLWF acquisition and any supplemental acquisition site survey activities to allow Kee to focus on topographic surveys. Start working on temporary easements for access early as these are critical to project success and factor into various assessment and design efforts. Review NCDOT project plans and encroachment requests early to understand considerations for agreements and coordination.

## 90% and Final Design and Permitting

During 90% design, the design team will finalize grading and design and no-rise modeling, all project alignments, profiles and typical sections, details, planting plan, and erosion control. Future potential park and greenway features, areas and corridors will be identified for reference. Any additional details regarding these features will

be provided in planning format within a technical memo, as park and greenway elements are not funded under the current grants. Erosion control plan sheets and details will prescribe best management practices for construction implementation. A site preparation plan will delineate how to limit site compaction and treat invasives, as well as how to amend soils for target plant growth. Bid items will be separated by funding source. We will prepare DWI's bid and design document submittal checklist, notably to include environmental documentation, permit submittal verification and status, easement/encroachment agreement information, a line-item cost estimate for the project, bid alternate information, statute compliance verification, final review plans, and engineering specifications. The DWI submittal package will be reviewed by a QA/QC reviewer. As a deliverable, the 90% design phase will result in final drawings sealed for review by DWI. Also, drawing sets will go out for permitting at various stages between 60-90% as information is sufficient to pursue various permits. All DWI and other permitting agency comments will be addressed on the plans, specifications and bid package. The final bid and design review package will be submitted by June 2024.

**90% and Final Design and Permitting**

***Key Dates:*** Feb-Mar, 2024: Submittal of permitting packages for 404/401, floodplain and ESC permits
Apr 2024: Completion and submittal of DWI review package and final sealed plans, specifications and bid package for review purposes.
May-June, 2024: Receive all permits and address all comments from initial DWI submittal for Jun, 2024 resubmittal.

***Deliverables:*** Sealed final drawings for review with technical memo summarizing updates to project decision making rationale based on final design; final proposed condition model demonstrating no-rise; all permit packages complete and submitted; DWI review package submittals.

***Risks and Opportunities Addressed:*** Provide close attention to vegetation management, a large factor in long-term site success. Maintain schedule targets for permitting and DWI submittals. Estimate anticipated construction costs as early step in draft final design in order to allow for consideration of strategies to stay within budget as it related to bid document preparation and presentation of base and alternate bid items.

**Bidding, Implementation and Monitoring**

Wildlands will determine, in conjunction with the City, whether to pre-qualify bidders identify contractors with suitable experience. Pre-qualification is also a way to formally introduce contractors to the project at an early stage, familiarize them with the schedule, and generate interest from potential contractors. We propose to bid the project in Aug-Sep, 2024, in order to allow for sufficient time for re-bidding if insufficient bids or other federally required conditions are not adequately met. This schedule allows for construction contract award by December 2024. Construction will commence in Winter 2024-2025 and all tree clearing will be completed prior to April 1 to avoid impacts to T&E bat species. Wildlands anticipates being on-site multiple times per week over a period of 9-12 months during construction and subsequent planting, with construction anticipated to be completed in winter 2025-2026. It is anticipated that permitting requirements will include monitoring for stream stability. Hydrologic monitoring and project evaluation and outreach through reporting at professional conferences or in similar settings have been proposed under the DWI grant. Wildlands will prepare an operations and maintenance plan that prescribes target activities for site stewardship.

**Bidding, Implementation and Monitoring**

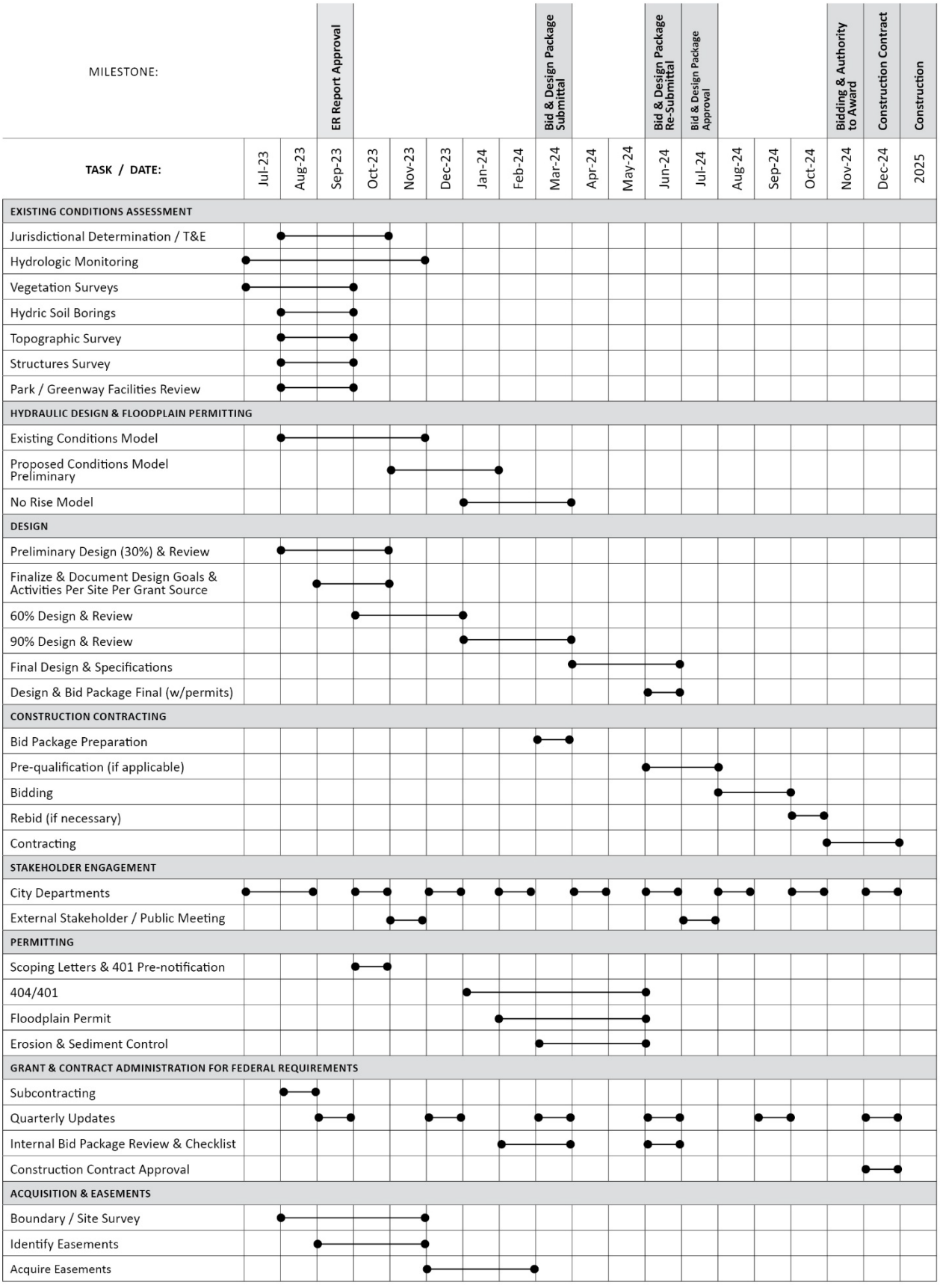
***Key Dates:*** June 2024: Final DWI bid and design package submittal. Fall 2024: Bidding. Dec 2024: Contract. Dec. 2025 +/-: Construction Complete

***Deliverables:*** Final bid package. Bid documentation for authority to award request. Construction observation summaries and progress tracked in ArcGIS Online application.

***Risks and Opportunities Addressed:***
Generate interest from contractors early. Bid requirements must be met including three bidders participating. Conduct QA/QC and peer review of external work products for DWI and review of bid methods, including base versus alternate bid items. Give proper attention and consideration to post-construction monitoring, maintenance and stewardship of project.

*Wildlands' Land Stewardship Team oversees maintenance of over 70 stream, wetland and riparian buffer mitigation sites*

## 4.0 Proposed Schedule



## 5.0 References

The following contacts can speak to Wildlands' qualifications, experience, and involvement with similar projects.

| Contact | Contact Info | Notable Services Provided |
|---|---|---|
| References to verify the Team's qualifications, experience, and involvement **in the stated activities and projects**. | | |
| **Paul Dow**,<br>*City Engineer,*<br>City of Greenville, SC | (864) 467-4410,<br>pdow@greenvillesc.gov,<br>206 S Main St, Greenville, SC 29601 | Stream restoration and innovative stormwater design, floodplain mitigation, modeling/FEMA, permitting, federal grant administration |
| **Susannah Horton**,<br>*Parks & Recreation Project Manager*,<br>City of Asheville, NC | (828) 450-4595,<br>shorton@ashevillenc.gov,<br>70 Court Plaza, Asheville, NC, 28802 | Park and trail planning, stream and wetland restoration, innovative stormwater SCM design, floodplain/FEMA modeling and permitting |
| **Paul Wiesner**, *Western Regional Supervisor,* North Carolina DEQ NC Division of Mitigation Services | C: (828) 273-1673,<br>paul.wiesner@ncdenr.gov,<br>2090 US 70 HWY, Swannanoa, NC 28778 | Stream and wetland design, riparian buffer planting and invasives management, conservation easements, floodplain/FEMA modeling and permitting |
| References to verify the Team's qualifications, experience and success in **administering projects funded by private, federal and state grants**. | | |
| **Renee Fortner**, *Watershed Resources Manager*,<br>Riverlink (on vacation)<br>Alt.: **Lisa Raleigh**,<br>*Executive Director* | (828) 252-8474 x 114<br>renee@riverlink.org,<br>170 Lyman St, Asheville, NC 28801<br>Alt. : 828.252.8474 x 116 | Private, state, and federal grant development and administration, innovative stormwater design, stream and wetland design, riparian buffer planting and invasives management, park and amenity planning/design |
| **Jason Meador**, *Aquatic Programs Manager,*<br>Mainspring Conservation Trust | (828) 524-2711 x309,<br>jmeador@mainspringconserves.org,<br>557 E. Main St, Franklin, NC 28734 | Grant development, administration support, private, federal and state grants including LWF, EPA 319 |
| **Anne Phillip**,<br>*Stormwater Technician,*<br>Town of Black Mountain | (828) 419-9374, Anne.Phillip@tobm.org,<br>160 Midland Ave,<br>Black Mountain, NC 28711 | Successfully implemented EPA 319 project and provided administration support to Land of Sky, successfully implemented state funded stream restoration projects |
| References to verify the Team's qualifications, experience, and success in **compliance with federal and state law requirements for contracting, procurement, and construction administration and reporting for federally funded projects**. | | |
| **Rob Winkler**,<br>*Special Projects Manager,*<br>City of Morganton, NC | (828) 438-5278,<br>rwinkler@morgantonnc.gov,<br>305 E. Union St, Suite A100,<br>Morganton, NC 28680 | Flood mitigation, stream and wetland design, innovative stormwater design, LID water quality treatment, riparian buffer development, invasive species management, park and amenity planning support, FEMA, grant administration/ closeout support, agency coordination, public outreach |
| **Mary Roderick**, *PhD Regional Planner,*<br>Land of Sky Regional Council | (828) 251-7444, Mary@landofsky.org,<br>339 New Leicester HWY, Suite 140,<br>Asheville, NC 28806 | Grant development, administration support, private, federal and state grants for Town of Black Mountain and others |
| **Sandra Wilbur**,<br>*Manager Stormwater Special Projects,*<br>City of Durham, NC | (919) 560-4326,<br>Sandra.Wilbur@durhamnc.gov,<br>101 City Hall Plaza, Durham, NC 27701 | Stream and wetland restoration, innovative stormwater design, floodplain mitigation, modeling & FEMA, permitting, federal and state grant administration |

## 6.0 Fee Rate Table

The following table presents staff rates for anticipated key and support staff.

Survey and Field Crew and Staff Scientist rates for Kee, WithersRavenel, Ecoforesters, and ClearWater are provided below as field staff have not been included in resumes due to page limitations. Resumes are available upon request.

| PROFESSIONAL CLASS | TEAM MEMBERS | HOURLY RATE * |
|---|---|---|
| **Wildlands Engineering** | | |
| Principal | Shawn Wilkerson | $295.00 |
| Senior Project Manager | Mike Fowler, PE | $235.00 |
| Senior Engineer II / Senior Project Manager | Jake McLean, PE, CFM | $215.00 |
| Senior Scientist I | Ian Eckardt, PWS<br>Scott Gregory, GISP, PLS | $165.00 |
| Engineer I | Jacob Wiseman, PE, CFM<br>Julie Bernstorf, PE | $155.00 |
| Designer II | Jesse Kelley<br>Richard Wright, EI | $155.00 |
| Designer I | Miriam Badre, EI (starts 8/1/23) | $136.00 |
| Scientist III | Joe Lovenshimer<br>Mimi Caddell | $130.00 |
| Scientist II | Jess Waller | $120.00 |
| **Traffic Planning & Design** | | |
| Greenway Designer | Christy Staudt, PE | $205.00 |
| Landscape Architect | Teresa Buckwalter, PLA | $145.00 |
| **ClearWater** | | |
| Senior Scientist II | Clement Riddle, PWS | $175.00 |
| Biologist II/III | TBD | $113.00 |
| **WithersRavenel** | | |
| Engineer II | David Perry, PE, CFM | $210.00 |
| Surveyor | Marshall Wight, PLS | $170.00 |
| Survey Crew (3) | TBD | $225.00 |
| Survey Crew (2) | TBD | $190.00 |
| **Kee Mapping & Surveying** | | |
| Surveyor | Brad Kee, PLS | $120.00 |
| Survey Crew (3) | TBD | $175.00 |
| Survey Crew (2) | TBD | $150.00 |
| **Ecoforesters** | | |
| Foreman | Krishun Karau | $75.00 |
| Invasives Crew (5) | TBD | $250.00 |

* Rates may be adjusted up to 5% annually.

## 7.0 Closing Statement

Wildlands is a full-service, vertically integrated ecosystem restoration firm with the knowledge, experience, and passion necessary to lead the Lower Mud Creek Floodplain Restoration and Flood Risk Reduction Project to success for the City of Hendersonville. The key individuals on the Wildlands Team have worked together on a multitude of projects right here in Western North Carolina and will operate smoothly as a cohesive unit. Mr. McLean will have support from principal and QA/QC staff, Mr. Wilkerson and Mr. Fowler, as well as from senior local staff such as Mr. Gregory and Mr. Wiseman, who provide a foundation for the oversight and fulfillment of key project activities.

The Wildlands Team includes TPD staff to provide greenway and park input. TPD's current local work on Above the Mud, pedestrian projects and rail trails will provide timely and insightful contributions, including at the downstream interface of the acquisition site with the Saluda Rail Trail. WithersRavenel will provide additional survey capacity and familiarity with stormwater infrastructure. They recently completed planning and structure assessments for the City in order to evaluate failing relief culverts on the acquisition site. They will conduct relevant topographic or condition assessment to aid with modeling and design planning. They are also available to support other utility and infrastructure design consideration review as needed in these highly urbanized settings.

Mr. McLean has worked on several comparable and analogous projects in Hendersonville, Henderson County, and Western North Carolina. He excels at ensuring quality delivery of technically and socially complex projects at the intersection of ecological restoration, open space, and recreational planning. He has been extensively involved in greenway and park projects; he understands the collaborative efforts with partner firms who have a deeper level of expertise in these areas. The Wildlands Team will work to establish a clear design decision matrix in order to acquire quality input and consensus from stakeholders that can result in meaningful outcomes.

Wildlands holds the City as one of its best partners and values the relationship it shares with City staff immensely. As local citizens, we are not only honored but are excited at the chance to continue serving the City of Hendersonville in its conservation efforts to restore Mud Creek, its tributaries, and other local waters to enhance the ecological and civic value of its natural and recreational corridors.

*Wildlands urban stream restoration projects within natural and recreational corridors*