



FY 2023 Storm Water Services

Capital Improvement Program Annual Report Highlights

Letter from the Director



*Don Ceccarelli,
Division Director*

Successes and challenges throughout the second year of the 15-year Storm Water Services Capital Improvement Program

Storm Water Services (STW) is on track to meet the risk reduction and water quality improvement goals identified in the 15-year Capital Improvement Program (CIP). We have adapted to many challenges and continue to build on the successes. These improvements to our natural stream systems in the mapped floodplain would not be possible without the continuing support from the Storm Water Advisory Committee (SWAC), County leadership, elected officials, and other partners. What we learn from the FY23 challenges and successes will take us into the next fiscal year with confidence that the 15-year CIP is moving in a positive direction.

The greatest challenge for the Flood Mitigation CIP in FY23 was navigating through the changing real estate market. The primary effort to reduce flood risk is directed in two (2) ways; buyouts and private mitigation actions supported through our retroFIT grant program. Specific challenges include soaring prices, lack of replacement property, moving costs and private buyers willing to pay above appraised value. In February the County Commissioners approved a new relocation payment program to incentivize owners to sell in McDowell Farms neighborhood. And we completed our most interesting home elevation this Spring through a partnership with HGTV on an episode that aired July 8, 2023.

The greatest challenge for the Water Quality CIP in FY23 continues to be securing easements from landowners to complete the stream improvements needed to improve the health of our streams and floodplains. In FY23 there were 15 water quality projects in various stages from design, easements and permitting, construction and warranty. STW secured more outside funding than expected in FY23 when \$2.3M of past project “credits” were purchased through Charlotte’s mitigation bank and the County provided \$3.0M in American Rescue Plan Act (ARPA) funding for a project on Irwin Creek. STW is evaluating options for obtaining easements in FY24.

FY24 is setup to be successful with a few key acquisitions already in negotiations and two (2) stream projects about to break ground. STW will also be reviewing funding assumptions developed in FY23 and will update the financial model as part of the FY25 budget process.

Don Ceccarelli

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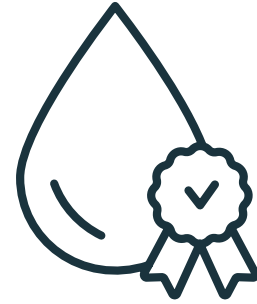
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Currently there are 14 active Water Quality (WQ) CIP projects in various stages of completion throughout the County, ranging from the early permitting stage to the warranty stage. Projects take approximately 3 to 5 years to plan, design and construct. Tasks include easements and land acquisition, contract bid, construction, and finally warranty. Easements and land acquisitions were the top challenges in FY23. Currently, STW staff is focusing on identifying the next group of stream reaches to begin planning and acquire possible grants to supplement funding.



3.0

**STREAM MILES IMPROVED
AND AUTHORIZED**

Since 1997, **105.4 stream miles**
have been improved.

LONG CREEK PHASE 1 & 2

LSC-POLK TO SC STATE LINE

STEWART CREEK TRIBUTARY #2

WEST BRANCH ROCKY RIVER PHASE 2

STEWART CREEK PHASE 2

STEWART CREEK PHASE 3

2

**PLANNING
PROJECTS**

4

**DESIGN
PROJECTS**

6

**CONSTRUCTION
PROJECTS**

2

**WARRANTY
PROJECTS**

The 14 Water Quality projects are in various phases to completion, from design, planning, construction and finally warranty. The planning phase may include easements, feasibility study and partner coordination.



FY23 provided some challenges for the Flood Mitigation program in acquiring properties because of high property values and high interest rates. Even with these difficulties, STW acquired 10 properties equaling a reduction of more than 6,000 Flood Risk points.

While working on renovating the home of a deserving Charlotte family, producers of HGTV's show "Build It Forward" discovered the home was in a floodplain and needed to be elevated to become compliant. Because of the cost of an elevation, the producers were ready to nix the project. County STW's retroFIT grant program stepped in to help, providing 75% of the cost to elevate and the project was completed.



The show aired on HGTV on July 8th at 6 p.m.

9,972

FLOOD RISK
POINTS MITIGATED (RARR)



ACQUISITIONS: **10 PROPERTIES** (6,411 PTS)



WET FLOODPROOFING: **1 PROPERTY** (160 PTS)



ELEVATION: **2 PROPERTIES** (184 PTS)



DEMOLITION/REBUILD: **3 PROPERTIES** (3,217 PTS)

10 → 4.5

HOMES
DEMOLISHED ACRES OF OPEN
SPACE CREATED

Since 1988, **471 buildings** have been demolished to create **198 acres** of open space.



472

TREES PLANTED



\$994,726

FY23 FLOOD INSURANCE
SAVINGS COUNTYWIDE



FY 2023 ACCOMPLISHMENTS

Flood Mitigation



Program Overview

A total of 9,972 points were mitigated in FY23. The reductions are the result of actions by STW through buyouts and retroFIT grants. STW reduces flood risk through the acquisition and demolition of flood prone structures and by providing funding to homeowners for the implementation of measures to reduce flood risk on their property.

15 YEAR FLOOD MITIGATION GOAL

FY	CUMULATIVE RISK POINT REDUCTION GOAL	ANNUAL FUNDING ALLOCATION	FY	CUMULATIVE RISK POINT REDUCTION GOAL	ANNUAL FUNDING ALLOCATION
FY22	Goal 5,500 Actual 9,425	\$3,000,000	FY30	109,500	\$8,150,000
FY23	Goal 13,000 Actual 19,397	\$3,960,000	FY31	124,000	\$8,150,000
FY24	23,500	\$5,810,000	FY32	138,500	\$8,150,000
FY25	36,000	\$6,980,000	FY33	153,500	\$8,150,000
FY26	50,000	\$8,150,000	FY34	167,500	\$7,420,000
FY27	65,500	\$8,150,000	FY35	180,000	\$7,420,000
FY28	80,000	\$8,150,000	FY36	193,500	\$7,420,000
FY29	95,000	\$8,150,000			

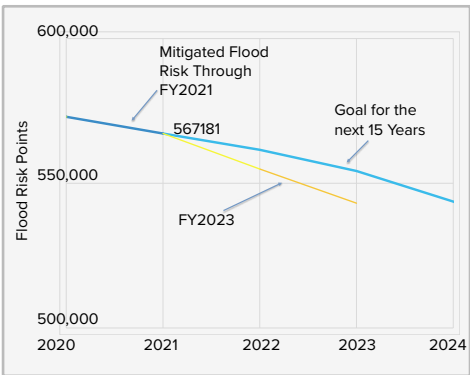
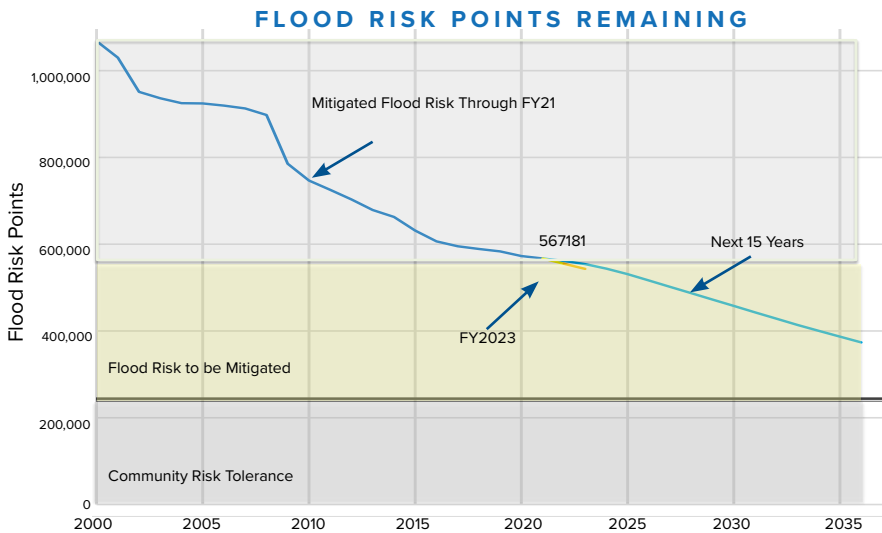
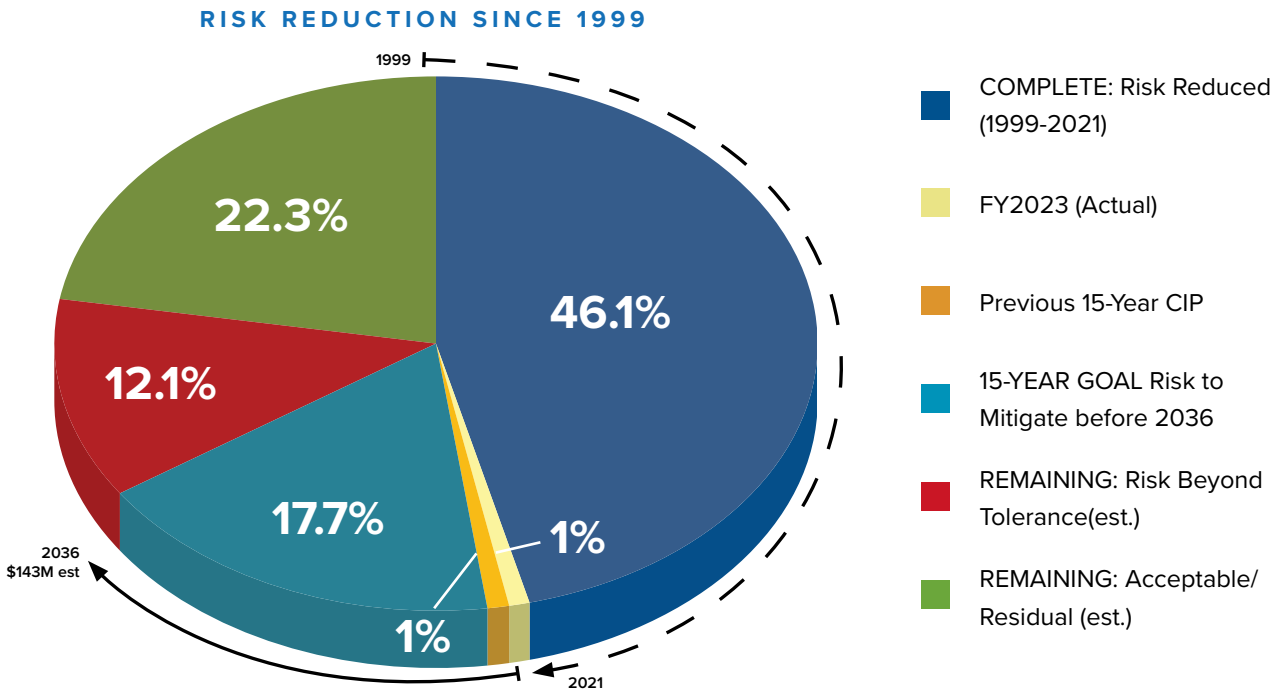
FY23 FLOOD MITIGATION COSTS

TYPES OF PROJECTS	# OF PROJECTS	COST TO UTILITY	TOTAL COST
Acquisition/Demolition	10	\$3,256,022	\$4,307,646
retroFIT Demolition	3	\$65,650	\$184,725
retroFIT Elevation	3	\$317,473	\$454,700
retroFIT Wetfloodproofing	1	\$11,641	\$14,551
	17	\$3,650,756	\$4,807,970



Detailed Reporting

The flood mitigation CIP is guided by the Flood Risk Assessment and Risk Reduction Plan (RARR Plan). The RARR Plan was presented by STW staff, endorsed by the Storm Water Advisory Committee (SWAC) and subsequently approved by the Mecklenburg Board of County Commissioners (BOCC) in 2012. The RARR Plan presents a scoring system used for identifying and prioritizing flood mitigation options on approximately 5000 structures in Mecklenburg County. The scoring system assigns flood risk points for various building features impacted by flooding. Examples include crawlspace flooding, living space flooding and flooding of mechanical equipment. More points are assigned as the frequency and severity of the impacts increase and higher points are indicative of higher flood risk. The RARR Plan also evaluates mitigation options for each flood prone structure in Mecklenburg County and determines their effectiveness and viability.





Terminology

Major system: Creek with a watershed or drainage area of 1 sq. mile or more. Creek is considered FEMA regulated.

Minor system: Creek, tributary, ravine, culvert, etc. that has a drainage area less than 1 sq. mile. Not FEMA regulated.

Risk Assessment Risk Reduction (RARR): The technical concept of the RARR Plan includes three components that are combined to rank and prioritize mitigation activities. These components are Flood Risk Property Score, Risk Reduction Recommendations and Mitigation Priority Scores.

Risk Score: The flood risk score of an individual property includes two main factors: 1. The likelihood of various floods occurring on that property. 2. The damage (financial impacts) that will follow in the event of flooding. There are nearly a dozen different components to analyzing a property's likelihood of flood and financial impact.

retroFIT: (Floodproofing • Improvements • Together) The retroFIT program offers financial and technical assistance to owners that undertake flood damage reduction measures for existing buildings in the regulated floodplain. retroFIT options include Structure Elevation, Equipment Elevation, Wet/Dry Floodproofing, Abandon Basement, and Demolition.

Repetitive Loss: Flood-related damages sustained by a structure on two separate occasions during any 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25% of the Market Value of the structure before the damage occurred.

Losses Avoided: Monetary calculation of savings after mitigation efforts have been completed. For example, since the buyout of the Doral and Cavalier Apartments more than \$10 million in damages did not occur because the building were removed.

FEMA Hazard Mitigation Assistance Grant: FEMA's hazard mitigation assistance provides funding for eligible mitigation measures that reduce disaster losses.

Hazard Mitigation Grant Program (HMGP): A federal post-disaster program intended to reduce future disaster losses. HMGP funding is made to states after a presidentially declared disaster. The states in turn distribute the funds to local communities according to state priorities, subject to FEMA approval.

FEMA Cooperating Technical Partners (CTP) Program: Program directed at strengthening the effectiveness of the National Flood Insurance Program through partnerships with state and local entities. FEMA provides funding for local initiatives to develop hazard identification and risk assessment products that lead to increased public awareness.



Acquisition and Demolition

10 PROPERTIES ACQUIRED AT A COST OF \$3.25M ·
6,411 FLOOD RISK POINTS MITIGATED · 4.4 ACRES FLOODPLAIN RECLAIMED

Buying and removing buildings from the floodplain is one of the most cost-effective ways to reduce long-term flood damage and creates many other community benefits. Floodplain acquisitions provide community recreational and open space. Since 1998, STW has purchased over 470 homes and businesses and removed them from the floodplain.

Buyouts were very challenging in FY23 because of the real estate market. Soaring prices, lack of replacement property, and private buyers willing to pay above appraised value made the voluntary buyout program especially difficult. We expect these trends to continue in FY24 on top of higher interest rates, which will make it hard for some sellers to move into comparable homes.

Many homes in the McDowell Farms floodplain now rank near the top of Storm Water Services priority list to reduce or eliminate flood risk. STW purchased 4 homes in FY23 with grant money from The Hazard Mitigation Grant Program (HMGP). Phase 1 of the grant contract specifies up to \$4,150,486 for the acquisition of 15 structures. Incentives offered in FY23 included moving expenses paid and mortgage differential payments to help cover costs of recent significant increases in interest rates. Phase 2 application deadline has passed.

In FY23 there were 10 properties acquired at a cost of \$3.25 M., 6,411 Flood Risk Points mitigated and 4.36 acres of floodplain reclaimed.

** Pending Demolition*

FY23 DEMOLITIONS

ADDRESS	FLOOD RISK POINT REDUCTION	OPEN SPACE
5313 Dolphin Lane	916	0.27 acres
5701 Wedgewood Drive	241	0.44 acres
7300 Timber Ridge Drive	235	1.15 acres
4015 Barlowe Road	1148	0.24 acres
3108 Westfield Drive	796	0.47 acres
6425 Mounting Rock Road	228	0.26 acres
6429 Mounting Rock Road	399	0.28 acres
6525 Mounting Rock Road	1644	0.26 acres
3110 Cullman Ave *	688	0.78 acres
6440 Mounting Rock Road *	116	0.21 acres
	6411	4.4 acres



retroFIT (Floodproofing • Improvements • Together), is an element of Mecklenburg County’s flood mitigation efforts. The purpose of the retroFIT program is to offer financial and technical assistance to owners that undertake flood damage reduction measures for existing buildings in the regulated floodplain.

Financial grants are available to reimburse 75-95% of eligible expenses for qualified floodproofing projects. The program is intended to assist floodplain property owners who may not be currently served by other mitigation efforts (e.g. creek restoration/mitigation projects and buyout programs) and are at risk for future flood losses.

FY23 RETROFIT PROJECTS

PROJECT LOCATION	PROJECT TYPE	FLOOD RISK POINT REDUCTION
2011 Lake Drive	Demo/Rebuild	2265
1815 Masonic Drive	Elevation	110
4039 Abingdon Road	Demolition	629
3401 Mar Vista Circle	Demolition	291
1629 Myers Park Drive	Wet Floodproofing	160
1701 Jameston Drive	Demolition	32
1215 Spruce Street	Elevation	74
		3561

FY23 HIGHLIGHTS

- retroFIT applications received: 24
- 7 retroFIT projects have been completed representing \$394,764 in grants. The total flood risk reduction points add up to 3,561 and all are approved by the Storm Water Advisory Council.
- STW partnered with **HGTV Build It Forward** television program to elevate a home to make it fully compliant with floodplain regulations.
- There are several additional retroFIT projects in progress and are in various stages of completion and will be added to FY24 CIP Annual report.
- Two home elevations are expected to be completed on Riverside and Lake Drives on the Catawba river in FY24.



^ Flood vent

Private Mitigation

Storm Water Services built a reporting tool to record when residents mitigate the flood threat to their property without retroFIT Grant money, Storm Water fees or County grant money. Sometimes a property does not qualify for a retroFIT grant and the resident uses their own money to mitigate the property. Flood Risk Points on the property are reduced and this tool records the change in score. It is important to note that the private sector can also add to the flood risk pool by development of previously undeveloped lots within the floodplain. Even if these new structures are compliant, they still add a measure of overall flood risk to the community. The private sector reduces the flood risk pool through the redevelopment of properties within the FEMA floodplain whereby older high-risk structures are replaced by new compliant structures and therefore lower risk.



^ Equipment elevation

PRIVATE FLOOD MITIGATION SUMMARY NET IMPACT

Risk Points Reduced	# of Projects	Action
↓ 4,569	18	Demolition

Risk Points Added	# of Projects	Building Type
↑ 2,744	32	4 Garage/Warehouse 18 Single Family Residential 10 Multi-family

2,605

NET RISK POINTS REDUCED

From 50 private projects

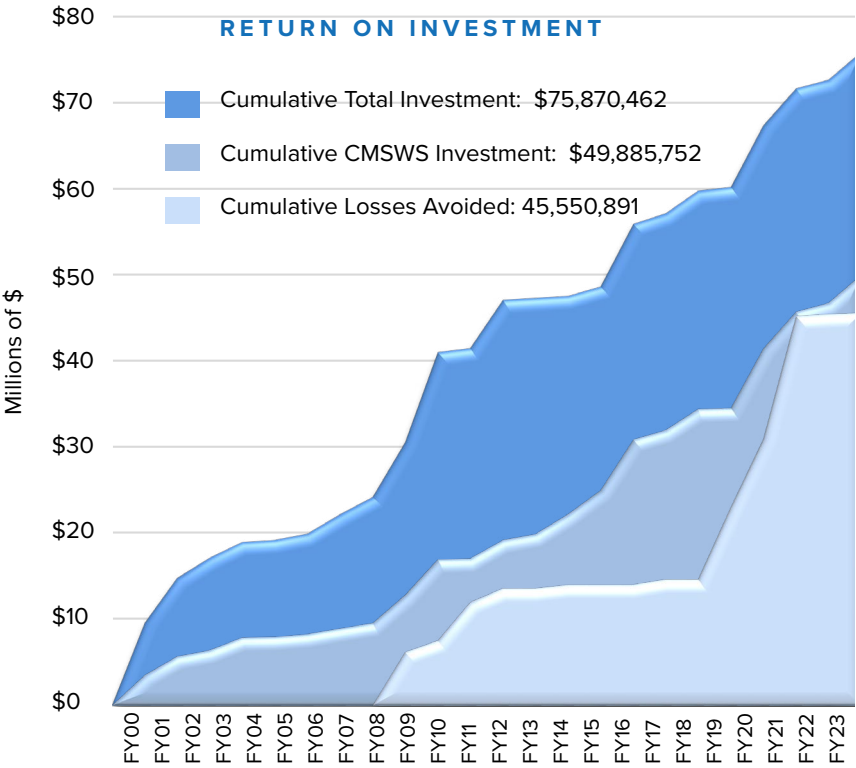


Losses Avoided

^ Flooding at Briar Creek and Commonwealth

To evaluate the cost-effectiveness of its mitigation program, STW usses a Losses Avoided Tool, which determines the value of flood losses and the damages that would have occurred if the building were still impacted. The tool asses the actual effectiveness of two mitigation implementations: property acquisition and structure elevation.

The Losses Avoided calulations are based on the following categories. building losses, mechanical equipment, vehicle loss, displacement costs, and emergency response costs.



FY23 FLOOD EVENTS

STORM DATE	LOSSES AVOIDED
7/7/2022	\$35,263
7/13/2022	\$57,795
7/19/2022	\$2,089
9/30/2022	\$ 2,089
1/4/2023	\$50,803
FY23 TOTAL	\$148,039
SINCE 1998	\$45,550,891



Funding and Partnerships

FLOOD MITIGATION ASSISTANCE

Flood Mitigation Assistance (FMA) is a federal pre-disaster grant program that provides funds for planning and mitigation projects intended to reduce the risk of flood damage. Having flood insurance and demonstrating a benefit to cost ratio greater than one are prerequisites for eligibility. Projects that mitigate buildings with multiple prior claims are given priority in the nationally competitive ranking for awards.

STW identified 7 properties that qualify for FMA acquisition grant funding based on the Severe Repetitive Loss list. Each property was mailed a letter and was visited by STW staff where educational material and information was left at each property.

HAZARD MITIGATION GRANT PROGRAM

The **Hazard Mitigation Grant Program (HMGP)** is a federal post-disaster program intended to reduce future disaster losses. HMGP funding is made to states after a presidentially declared disaster. The states in turn distribute the funds to local communities according to state priorities, subject to FEMA approval.

Storm Water Services has two current projects that have been awarded funding from the Hurricane Florence HMGP grant to North Carolina. The Kings Branch stream restoration and flood mitigation project is meant to improve water quality and reduce flood hazard along Kings Branch between Archdale Drive and Arrowood Road, (Phase 1 of the grant is \$380,000). The McDowell Farms flood mitigation project purchased four (4) structures in FY23 and the project is ongoing with 2 more properties under contract. A third project, to be funded from Hurricane Dorian disaster relief has been approved. Elevation of four (4) structures on Hanson Drive are scheduled to begin in early FY24.

COOPERATING TECHNICAL PARTNERS

The FEMA **Cooperating Technical Partners (CTP)** program is directed at strengthening the effectiveness of the National Flood Insurance Program through partnerships with state and local entities. FEMA provides funding for local initiatives to develop hazard identification and risk assessment products that lead to increased public awareness.

Storm Water Services participates in the FEMA Letter of Map Revision partnership through the CTP program. In this partnership, requests to revise flood maps and data are processed in-house rather than by FEMA contractors. The partnership is funded by FEMA through an annual grant to Storm Water Services that may vary from \$20,000 to \$50,000 per year.

RETROFIT PARTNERSHIP

STW partnered with HGTV's "Build It Forward" to help with a grant to elevate a structure featured in the program. The homeowner would not have been able to afford the cost of the elevation without the help of the grant.

In the future STW is seeking out grant funding opportunities to help economically challenged residents. Meetings were established with Habitat for Humanity and Rebuilding Together of Greater Charlotte.



Operations and Maintenance

PROPERTIES MAINTAINED BY STORM WATER OPERATION

- 453 total properties
- Mecklenburg County Park and Rec maintains 98 HMPs as part of the greenway system
- Storm Water Operations maintains 355 parcels

CONVERTING PROPERTIES TO PERMANENT USE

230 unprogrammed properties x 0.05=12 properties (FY23 goal)

Total properties 12

- Creek Relief volunteers planted 345 trees on 6 properties Riverside Drive, Beagle Club, Riverhaven Drive, and Lake Drive
- CLT Water removed construction laydown from Seneca Drive property and replanted 10 trees
- Greenway construction on Stewart Creek Trib 2, planted 29 trees on 2 properties on Norwood/Coronet
- 69 trees planted by contractor on 3 properties - Timber Ridge, Commonwealth, and Westfield

CHARLOTTE WATER USEAGE

- Charlotte Water is utilizing 7 properties in Madison Park for construction staging for Little Hope Creek sewer upgrades. This impact is expected to last through August 2024.

PROPERTIES USED FOR TRAINING BY CHARLOTTE FIRE & MECKLENBURG COUNTY SHERRIF'S DEPARTMENT

- Mecklenburg County Sherriff's department utilizes vacant properties prior to demolition for training K-9 units.

PROPERTIES MOWED

- 303 properties
- Annual cost \$212,505.24

TREES PLANTED

472 total in FY23 on 12 properties

INVASIVE SPECIES CONTROL

110 Acres of riparian corridor managed for invasive species as long-term stewardship of stream restoration projects



^ Creek Releaf along the Catawba River



^ Blue Flag Iris at Chantilly Littoral Shelf



^ Charlotte Fire uses buyout building along McDowell Creek for training



^ McDowell Creek after restoration

FY 2023 ACCOMPLISHMENTS

Water Quality



Program Overview

The health of our creeks and floodplains is a critical part of having good water quality in Mecklenburg County. This natural infrastructure has substantially degraded for decades. The water quality CIP aims to improve water quality by investing in improvements to our natural infrastructure. Restoration/enhancement of streams is accomplished through the re-shaping of the stream channel, removal of non-native vegetation and replacement with native species and the introduction of habitat into the stream channel itself.

The water quality CIP is guided by a numeric measure of stream health developed by STW staff called the Stream Restoration Ranking System (SRRS). The SRRS point system is used to guide selection of stream reaches for restoration/enhancement/preservation and used to measure the improvements of our capital investments. The SRRS score is made up of the 3 most important characteristics of a healthy stream; geomorphology (stream pattern, shape, slope), biological habitat (aquatic organisms), and riparian buffer (vegetation). The higher the SRRS score (up to a maximum of 300pts), the healthier the in-stream conditions are to support good water quality.

Each capital improvement project should achieve a SRRS score of at least 190 points which means the reach is stable and partly supporting of aquatic organisms. At least 50% of the projects completed should achieve a SRRS score of at least 230pts indicating the reach is stable and supporting of aquatic organisms. Success of the water quality CIP is measured by stream miles completed. During FY22 and FY23 miles were credited as complete at the time the construction contract was executed.

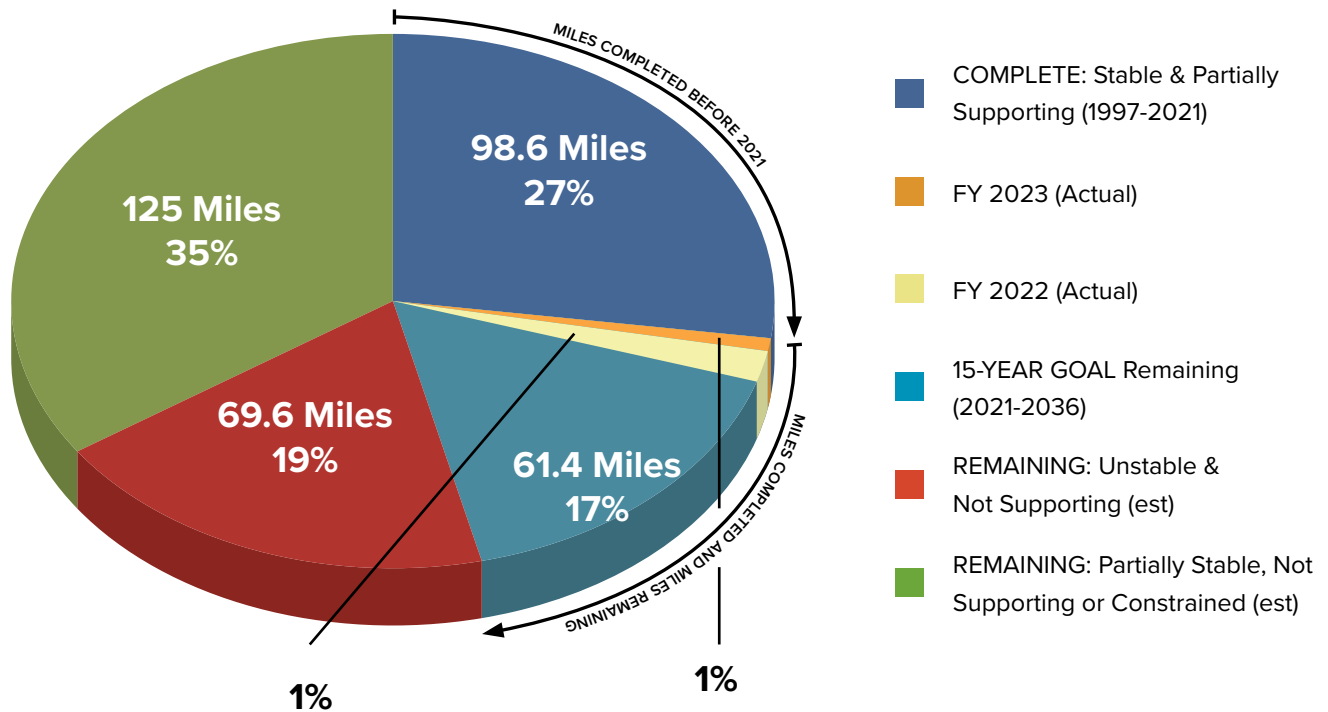
In FY23, 7 projects were under construction and 3.0 miles were completed and authorized. At the completion of the 2nd year of the 15-year CIP, cumulative total of 7.7 miles have been completed. This exceeds the FY23 cumulative goal of 5.0 miles.

15 YEAR WATER QUALITY CIP

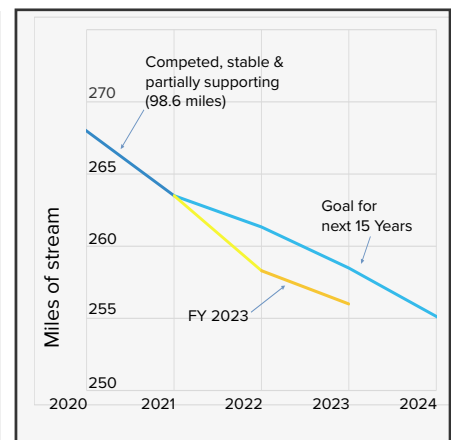
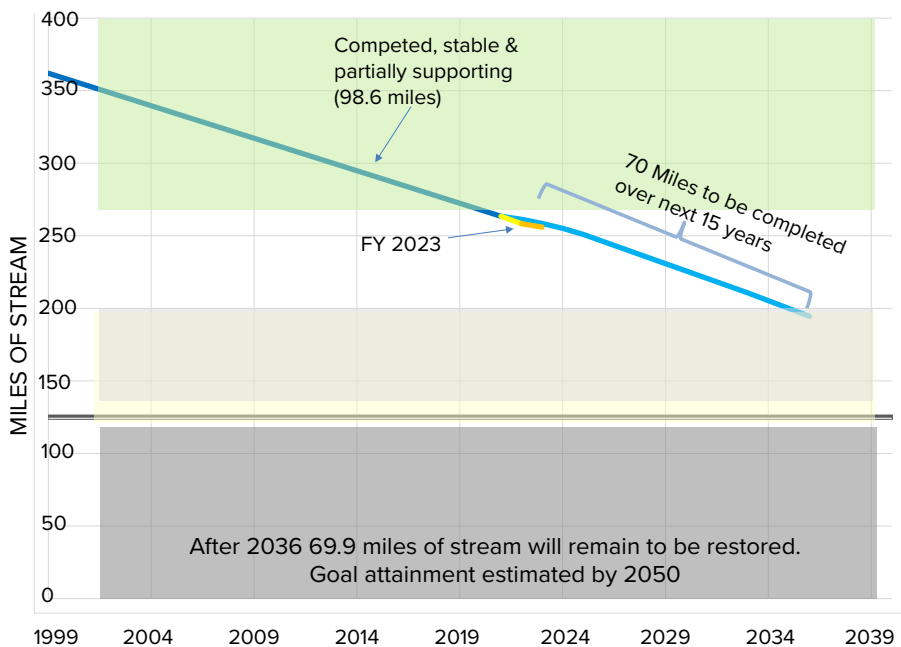
	CUMULATIVE STREAM MILES RESTORED	ANNUAL FUNDING ALLOCATION
FY22	Goal 2.2 Actual 4.7	\$5,200,000
FY23	Goal 5.0 Actual 7.7	\$6,840,000
FY24	8.4	\$8,040,000
FY25	12.6	\$10,070,000
FY26	17.6	\$12,100,000
FY27	22.6	\$12,100,000
FY28	27.7	\$12,100,000
FY29	32.7	\$12,100,000
FY30	37.8	\$12,100,000
FY31	42.8	\$12,100,000
FY32	47.9	\$12,100,000
FY33	52.9	\$12,100,000
FY34	58.2	\$12,830,000
FY35	63.6	\$12,830,000
FY36	68.9	\$12,830,000

Detailed Reporting

WATER QUALITY GOAL DRIVEN CIP



MILES OF STREAM UNSTABLE & NOT-SUPPORTING



FY 2023 ACTIVE PROJECTS



Stewart Creek Phase, matting and new vegetation



Long Creek Phase 1, vegetation growing along the stream



Terminology

SRRS score (Stream Restoration Ranking System): SRRS is a data evaluation/collection process to quantify a stream's existing conditions and improvements after restoration activities.

PROJECT PHASES

Planning: Survey crews document the existing creek, drainage system and surrounding areas. The project team uses this information, along with other data and resident reported drainage concerns to evaluate the existing system.

Design: The project team develops detailed design plans for proposed water quality and drainage system improvements. Additionally, any required federal or state permits are secured.

Easement Acquisition: The project team works with property owners to acquire temporary or permanent easements. Easements allow Storm Water Services to access private property during construction and/or to provide future maintenance.

Bid: A competitive bidding process is held to select a qualified contractor to construct the project. By state law, the lowest responsive, responsible bidder is selected.

Construction: Residents, business owners and other stakeholders in the project area are notified when construction is expected to begin and end. Once construction is underway, the main point of contact is Storm Water Services' project manager.

Warranty: All materials and workmanship are guaranteed by the contractor for one year after the project is accepted. Storm Water Services' project managers conduct inspections during the warranty period. Upon notification, the contractor will return to the site to make repairs at no additional cost.



Reintroduction of Mussels into Stevens Creek

PAST PROJECT HIGHLIGHTS · STORM WATER PARTNERSHIP WITH PARKS & RECREATION, STEVENS CREEK NATURE PRESERVE, CHARLOTTE WATER, US FISH & WILDLIFE SERVICE (USFWS)

PROBLEM & SOLUTION

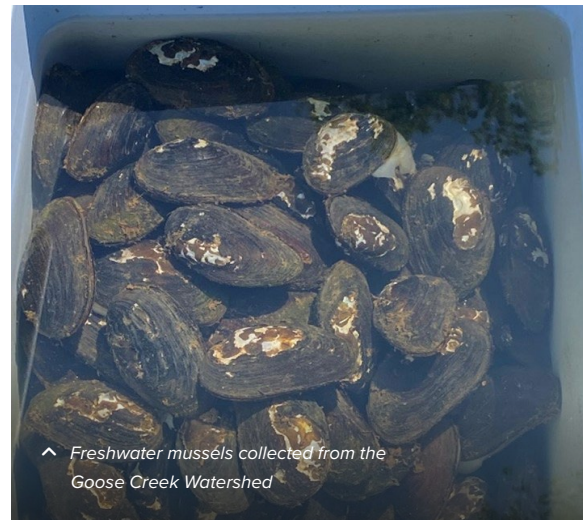
This stream was impaired with little to no habitat or aquatic life. Over widened and eroded stream banks required a full restoration to build back the channel, vegetation, and allow for new habitat to be introduced.

CHALLENGES & OUTCOME

It was unknown if new life would adapt to the stream but upon completion of the restoration the reintroduction of aquatic life brought all kinds of life back in the stream bed. To encourage freshwater mussel expansion, USFWS has relocated 920 mussels from the lower Goose Creek Watershed to the upper Stevens Creek with the total 2023 goal to reach 1,500 mussels in the restoration. For monitoring purposes, 130 of the total group were tagged with a microchip.

ADDITIONAL NOTES

The stream is fully vegetated just three years after construction. Continued monitoring of the aquatic life and stream conditions by STW and USFWS show amazing results. To date this project is one of the highest-ranking restorations conducted by Mecklenburg County in the history of the stream work. USFWS has been extremely pleased with the success of the project and response of the relocation efforts.



^ Freshwater mussels collected from the Goose Creek Watershed



^ US Fish & Wildlife staff release mussels into Stevens Creek

Little Sugar Creek

CURRENT PROJECT HIGHLIGHTS- COMPLETION OF A RESTORATION PROJECT & OPENING OF A GREENWAY

PROBLEM & SOLUTION

The last few miles of Little Sugar Creek just before North Carolina/South Carolina Stateline meander through bottomland hardwoods, much of which has remained undisturbed for decades. This area represents the largest undisturbed tract of land along Little Sugar Creek from its source. The stream follows an unconstrained route with steep 30- to 80-foot banks. The goal of the project was to stabilize and vegetate the high eroding banks, protect adjacent structures, and install stream structures to direct the flow away from the streambanks.

CHALLENGES & OUTCOME

Due to the size of the drainage area and its urban nature, the flow regime is very dynamic and the hydraulic geometry in these locations does not appear to support this flow diversity (i.e., poor low flow). The stream is collecting runoff from 50 square miles and flow has been observed to fluctuate from few inches to 3+ feet after a rainfall of ~0.7 inches in 24 hours. The project has been completed and the streambanks are now stabilized reducing sedimentation and habitat has been created.

ADDITIONAL NOTES

This project was a challenging restoration project to the size of the stream and the watershed. SWS was able to value engineer the project, and focus the work on sections that were the most erosive. The resulting project is amazing and the completion of 20 years of work on Little Sugar Creek.



^ Geese swimming in Little Sugar Creek



^ Opening of Greenway along Little Sugar Creek



Little Sugar Creek-Polk Historic Site to South Carolina State Line

PROJECT GOAL

Grade the eroding stream banks & prevent future bank failures especially along vulnerable structures; Manage the grading and grading costs, and coordinate construction efforts with Mecklenburg County Park & Rec to provide beautification and protection for the Cross-Charlotte Trail and stream. **Projected SRRS score is 202.**

PROJECT OVERVIEW

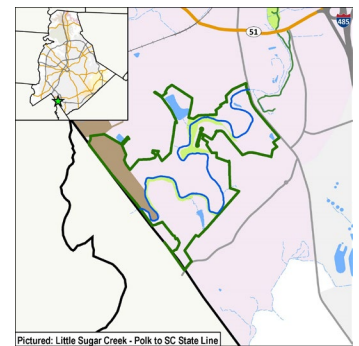
STW is working with Mecklenburg County Asset and Facilities Management and Mecklenburg County Park and Rec to restore the stream. JD Goodrum, Inc was awarded the construction contract. The project was be completed in 2023.

FUNDING NOTES

Cost: \$1.7 million per mile

Total funding: \$4,179,784.74 Mecklenburg County STW CIP.

<https://bit.ly/LittleSugarCreek>



Pictured: Little Sugar Creek - Polk to SC State Line

Historic Stewart Creek Stream Enhancement Project – Phase II

PROJECT GOAL

Grade and stabilize eroding stream banks and install stream structures to improve in-stream habitat; this will provide a new county-owned park and connect to existing greenways, improving water quality for the county, beautification and recreational enhancements, and improving habitat for native species. **Projected SRRS score is 224.**

PROJECT OVERVIEW

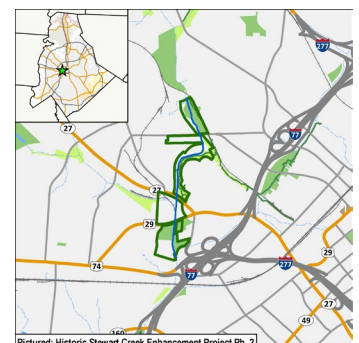
STW was awarded funding from the North Carolina Water and Land Fund (NCWLF) for construction. Blythe Development Company was awarded the construction contract. Project completed September 2023.

FUNDING NOTES

Cost: \$2.4 million per mile

Total funding: \$3,750,861.80 NCWLF & STW.

<https://bit.ly/StewartCreekPhase2>



Pictured: Historic Stewart Creek Enhancement Project Ph. 2

Historic Stewart Creek Enhancement Project Phase III

PROJECT GOAL

The objective of the project is to repair eroding stream banks, improve water quality, improve wildlife and aquatic habitat, and reduce the amount of sediment in the water. **Projected SRRS score is 224.**

PROJECT OVERVIEW

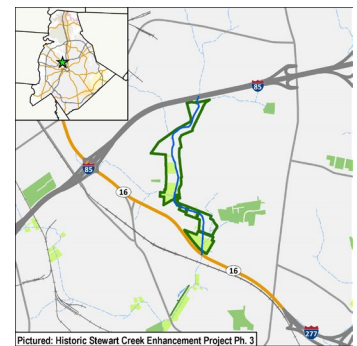
STW will construct an enhancement project on Stewart Creek from I-85 to La Salle St. in the third and final stage of the more than 3 miles project. The project is expected to begin in the fall of 2022 and be completed in 2023.

FUNDING NOTES

Cost: \$4.0 million per mile

Total funding: \$3,938,021 ARPA Funding

<https://bit.ly/StewartCreekPhase3>



Stewart Creek Tributary 2 Stream Enhancement Project

PROJECT GOAL

Water quality and ecological objectives associated with this project include improving stream stability, reducing sediment loading, improving in-stream habitat, and establishing a native riparian corridor. **Projected SRRS score is 226.**

PROJECT OVERVIEW

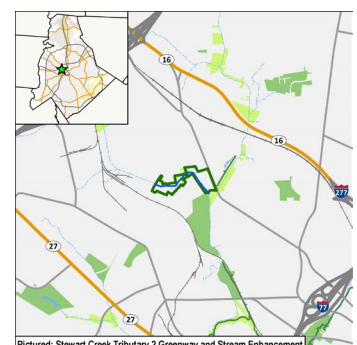
The Stewart Creek Tributary 2 Greenway and Stream Enhancement Project will improve creek banks to reduce erosion. This project is in partnership with Mecklenburg County Park & Rec Department that will extend the Stewart Creek Greenway by one mile.

FUNDING NOTES

Cost: \$1.8 million per mile

Total funding: \$596,242.90 Mecklenburg County STW CIP 100%.

<https://bit.ly/StewartCreekTributaryII>





| West Branch Rocky River Phase I – Tributary

PROJECT GOAL

The goal was to stabilize the tributary and main stem of West Branch Rocky River by grading the stream banks to a gentle slope that will support and sustain native vegetation during all seasons of mother nature's storm events for decades to come. **Projected SRRS score is 228.**

PROJECT OVERVIEW

Storm Water Services partnered with the Town of Davidson, Mecklenburg County Park & Rec Department along with local landowners. This is the first phase of a three phase project along the West Branch Rocky River and the tributary. The added length of the tributary will extend to the limits of the FEMA Floodplain.

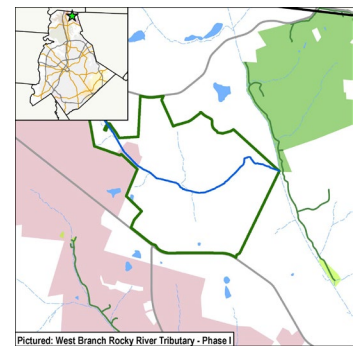
FUNDING NOTES

Cost: \$1.13 million per mile

Total funding: \$1,922,269 North Carolina Soil & Water \$39,952

STW \$1,882,317.

<https://bit.ly/WestBranchRockyRiver1>



Pictured: West Branch Rocky River Tributary - Phase I

| West Branch Rocky River Phase II

PROJECT GOAL

The goal will be to stabilize the tributary and main stem of West Branch Rocky River by grading the stream banks to a gentle slope that will support and sustain native vegetation. The project will extend from the confluence of the tributary to Gray Road (approx. 5,000 ft.). **Projected SRRS score is 224.**

PROJECT OVERVIEW

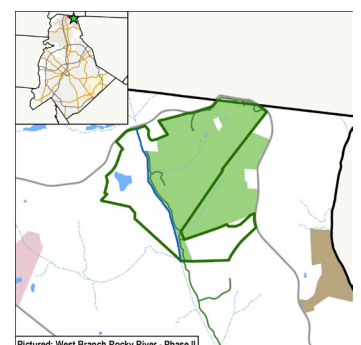
As of 7/2022 the project is in the design. The project has been delayed by the input of stakeholders on the project design. The total project, all three phases, will restore over 19,000 linear feet of stream in the Rocky River Watershed in the Town of Davidson.

FUNDING NOTES

Cost: \$3.2 million per mile

STW Total funding: \$3,200,000

<https://bit.ly/WestBranchRockyRiver2>



Pictured: West Branch Rocky River - Phase II

Long Creek Phase I, I-77 to Dixon Branch

PROJECT GOAL

The goal of this project is to stabilize eroded stream banks, restore the floodplain to its natural state and function, change the stream path to a more natural design, improve habitat for aquatic life, and enhance water quality. **Projected SRRS score is 230.**

PROJECT OVERVIEW

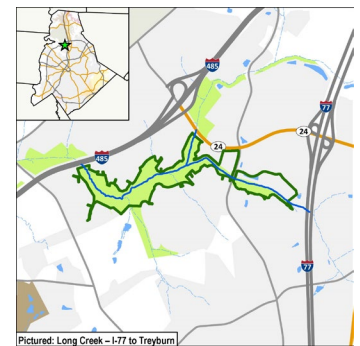
Charlotte-Mecklenburg Storm Water Services and Mecklenburg County Park and Rec are restoring the stream and constructing a greenway trail along Long Creek and Dixon Branch. A grant received from the NCWTF will partially fund the construction of this project.

FUNDING NOTES

Cost: \$2.5 million per mile

Total funding: \$3,501,434.96 NCWTF \$400,000 STW \$3,101,434.96.

<https://bit.ly/LongCreekPhaseI>



Long Creek Phase II Treyburn to I-485

PROJECT GOAL

The goal of this project is to stabilize eroded stream banks, restore the floodplain to its natural state and function, change the stream path to a more natural design, improve habitat for aquatic life, and enhance water quality. **Projected SRRS score is 221.**

PROJECT OVERVIEW

Mecklenburg County Storm Water Services and Mecklenburg County Park and Rec will add new greenway and stream improvement. NCLWF provided grant funding for the County Storm Water Services portion of the project only.

FUNDING NOTES

Cost: \$2.8 million per mile

Total funding: \$4,842,891 NCWTF \$400,000 & STW \$4,442,891.

<https://bit.ly/LongCreekPhaseII>





| West Branch Rocky River Phase III

PROJECT GOAL

The restoration of Phase III was be put on hold waiting for consensus from the public and Mecklenburg County Park and Rec input. The schedule for the current phase of the project has been moved back to permitting and design. The goal will be to stabilize the main stem of West Branch Rocky River by grading the stream banks to a gentle slope that will support and sustain native vegetation. The existing SRRS score is **110**.

PROJECT OVERVIEW

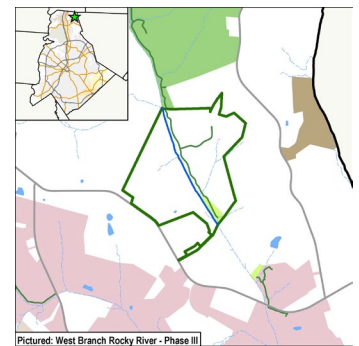
The location of the project is along the Mecklenburg County greenway running through Fisher Farms in the Town of Davidson. Because of the project's proximity to a very popular and heavily used greenway, local public feedback has been significant and has questioned the importance of the restoration. A new design is in progress.

FUNDING NOTES

Cost: \$4.3 million per mile

Estimated total funding is approximately \$2,500,000

<https://bit.ly/WestBranchRockyRiver3>



Pictured: West Branch Rocky River - Phase III

| Toby and Mallard Creek at UNCC

PROJECT GOAL

The stream restoration was designed to stabilize eroding stream banks, restore the floodplain to its natural state and function, improve habitat for aquatic life, improve stream buffer with species diversity and additional plants, and enhance water quality. **Projected SRRS score is 241.**

PROJECT OVERVIEW

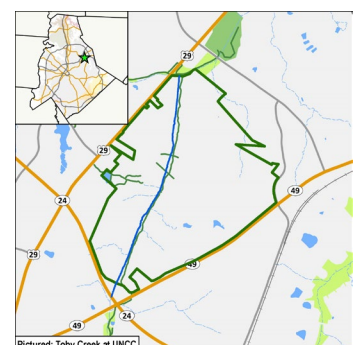
STW worked in partnership with Charlotte Water in a busy university environment was challenging. Charlotte Water was replacing a sanitary sewage line along Toby Creek while Storm Water was working on restoration in the creek. UNC-Charlotte was a significant partner as the majority of the stream restoration was through campus. Project completed in 2023.

FUNDING NOTES

Cost: \$3.2 million per mile

Total funding: \$6,501,230 NCWLF \$ 400,000 & STW \$6,101,230.

<https://bit.ly/TobyandMallardCreek>



Pictured: Toby Creek at UNCC

| Irwin Creek

PROJECT GOAL

The primary goals of the project include stabilization of streambanks to prevent trash migration, protection and enhancement of existing buffers, and water quality improvements. Using bank stabilization and vertical realignment buffer enhancements to reduce erosion and improve water quality within the project area through of the channel centerline, aquatic habitat improvement, and planting of native vegetation.

PROJECT OVERVIEW

Mecklenburg County Storm Water Services will restore approximately 5,400 feet of Irwin Creek from just below Interstate-85 to Statesville Avenue in Charlotte, NC. This site sits on a single parcel owned by the City of Charlotte. The site is the former Statesville Road Landfill. The landfill was operated by the City from 1940 to 1971 and was used for disposal of household, commercial, industrial, and institutional wastes.

FUNDING NOTES

Cost: \$TBD

Total funding \$ 2,350,000 ARPA Funding \$700,000 NCLWF

<https://bit.ly/IrwinCreek>



Pictured: Irwin Creek

| Kings Branch

PROJECT GOAL

The project has dual goals of reducing flood risk and improving water quality within the project area. The project will stabilize eroded stream banks, restore the floodplain to its natural state and function, improve habitat for aquatic life, and enhance water quality.

PROJECT OVERVIEW

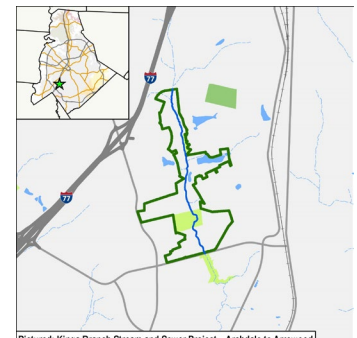
FEMA Grant funding has been approved. The proposed project will reduce base flood elevations by as much as 4.6 ft. at the Lexington Green Apartments. Six apartment buildings and one office/shop building are located within the FEMA Special Flood Hazard Area. The goal of the project is to reduce the Community Base Flood Elevation to one foot below the finished floor elevations of the at-risk buildings, bringing all 6 into compliance with the floodplain regulations.

FUNDING NOTES

Cost: \$TBD

Total funding: \$5,830,244 Requested

<https://bit.ly/KingsBranch>



Pictured: Kings Branch Stream and Sewer Project - Archdale to Arrowood



| Reedy Creek

PROJECT GOAL

Using natural channel design, the stream will be restored to a more stable state using channel pattern, bedform diversity, streambank stability, as well as promoting the increase of aquatic habitat. The project will also reconnect the section of Reedy Creek with its floodplain and improve baseflow water availability.

PROJECT OVERVIEW

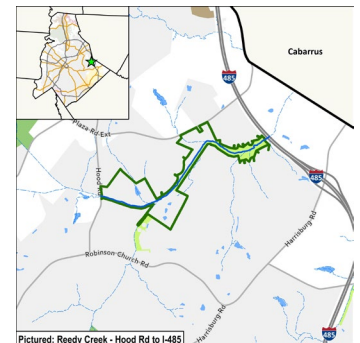
Mecklenburg County's Stream Restoration Ranking System (SRRS) is a process that scores both existing conditions and predicted uplift for the project. The representative reach of the project currently scores **117.57** out of 300. The SRRS goal will be to design a stream with an uplift score greater than or equal to **217.82**.

FUNDING NOTES

Cost: \$TBD

Total funding \$750,000 NCLWF

<https://bit.ly/ReedyCreekStream>



| Barlowe Road Flood Control and Restoration

PROJECT GOAL

The project has dual goals of reducing flood risk and improving water quality within the project area. The project will reduce flood elevation on 606 Dewolfe, remove bridge and road section on Barlowe from bridge to I-85. Add pocket wetlands and restore creek to reduce sediment loss.

PROJECT OVERVIEW

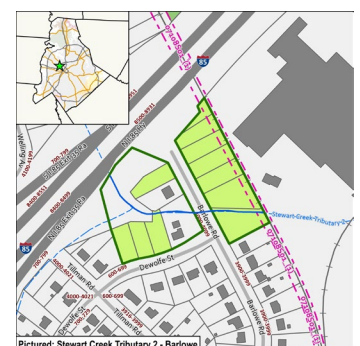
FEMA Grant funding has been approved. Flood mitigation goal is to reduce risk point by 73. The length of the project is 630 linear feet along mostly County owned land and one private parcel.

FUNDING NOTES

Cost: \$TBD

Total funding: \$150,000 STW and \$500,000 NCLWF

<https://bit.ly/BarloweRoadFloodControl>



Funding and Partnerships

NORTH CAROLINA LAND AND WATER FUND

(NCLWF), formerly known as the Clean Water Management Trust Fund, has conserved well over one-half million acres and protected or restored 3,000 miles of streams and rivers.

Long Creek Phase 1	\$400,000	Contract executed 2018
Long Creek Phase 2	\$400,000	Contract executed June 2020
Long Creek Phase 3	\$400,000	Contract executed Sept 2021
Long Creek total	\$1,200,000	2018-2021
Irwin Creek	\$700,000	May 2023
Barlowe Road	\$500,000	Fall 2023
Reedy Creek	\$750,000	Spring 2024

ARPA-AMERICAN RESCUE PLAN ACT

ARPA provides relief funds to eligible state, local and tribal governments that have been negatively affected by the Coronavirus. The purpose of the funding is to support communities hardest hit by COVID-19.

Stewart Creek	\$3,436,890	March 2023
Irwin Creek	\$2,350,000	January 2023

FEMA HAZARD MITIGATION GRANT PROGRAM

FEMA HMGP provides funding to state, local, tribal and territorial governments so they can develop hazard mitigation plans and rebuild in a way that reduces, or mitigates, future disaster losses in their communities.

Kings Branch	\$5,830,244	Requested
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MITIGATION BANK CREDITS

Mitigation banking is a system of credits and debits devised to ensure that ecological loss to wetlands and streams resulting from various development works, is compensated by the preservation and restoration of wetlands, natural habitats, and streams in other areas. In Charlotte-Mecklenburg, typically the City will purchase County Water Quality projects to offset the environmental impact from building roads, airport runways and other infrastructure projects.

PROJECT	COST	DATE
McDowell at Birkdale	\$1,730,600	May 2023
McAlpine at Sardis Rd.	\$1,027,216	May 2023



^ Stewart Creek Phase 2



^ Plant growth along Stewart Creek Phase 2



^ Pre-construction along Irwin Creek

Private Stream Restoration

Occasionally private developers and mitigation bankers construct stream restoration projects. Typically, these projects are constructed to offset land development impacts to nearby streams, improve aesthetics or to meet conservation goals. During FY23, a private stream restoration project was completed on McAlpine Creek Tributary 1A on property owned by Northwood Investors LLC in the Ballantyne area of Charlotte, NC. The project improved sinuosity, habitat, vegetation and aesthetics on approximately 0.25 miles of stream adjacent to The Ballantyne hotel.





Maintenance

Maintenance is critical to the success of the CIP Program. Any areas of concern found during annual inspections are categorized/reported to appropriate staff. Channel stability repairs and invasive species management are completed by Storm water Operations staff. Any substantial channel repairs may require engineered design plans and an outside contact agreement.

Inspection

At the end of a Water Quality CIP project's warranty period, post-construction inspections are conducted annually (minimum of 20 years). Visual inspections evaluate/document conditions of in-stream structures, streambank/buffer vegetation, Stormwater Control Measures (SCMs) and any easement encroachments. Inspection findings are digitally saved in the Environmental Data Management System (EDMS) and reported to designated staff (e.g., Project Manager, Storm Water Operations) for any corrective action(s).

Monitoring

To ensure long-term project success (20-year monitoring plan), postconstruction SRRS Field Score assessments are completed. Assessments are intended to monitor channel stability and habitat improvements. The Construction SRRS Field Score (MY1) is the benchmark SRRS for long term success.

The following post-construction SRRS Field Score assessments (Table 4 below) were performed during FY23.



✓ Table 4: Post-construction SRRS scores for completed projects

PROJECT LOCATION	PRE-CONSTRUCTION SRRS FIELD SCORE	DESIGN SRRS FIELD SCORE	CONSTRUCTION SRRS FIELD SCORE (MY1)	LATEST SRRS FIELD SCORE
Briar Creek (Briar Chantilly)	174	223	215	221 (MY3)
Edwards Branch (Briar Chantilly)	179	260	217	216 (MY3)
Torrence Creek (The Parks)	111	244	272	176* (MY2)
Briar Creek (Mint Museum)	173	201	216	211 (MY3)
LSC (Archdale to 485)	134	196	193	194 (MY3)
Stevens Creek	169	258	279**	270 (MY2)
LSC (485 to Polk)	181		In-progress	
Stewart Creek Phase I	149	224	228	

*Low SRRS score during MY2 field scoring due to damage from beavers.

**SRRS score exceeds the 230 project goal and is the highest score recorded to date.



FY 2024

Looking Ahead

Future Flood Mitigation

Ongoing implementation of the McDowell Farms neighborhood Hazard Mitigation Grant Program (HMGP) funding is a top priority for acquisition efforts. Staff continues to work with North Carolina Emergency Management to identify potential for Phase 2 of grant funding. The RARR plan has identified several areas with high concentrations of flood risk, which are presented in the following table. In FY24 staff will explore eligibility of these properties for funding under traditional federal flood mitigation grants and local funding. Staff will continue to explore all opportunities for partnerships, opportunistic acquisitions, and buyouts. Some of the possibilities may include additional acquisitions in previously mitigated areas, such as Madison Park and Sherwood Forest. Furthermore, flood events in FY24 that result in mitigation opportunities could be pursued. Ongoing retroFIT projects will continue to be implemented in FY24 along with focused community outreach consistent with the Hummingbird Report focused upon equity and inclusion. Overall, a cumulative 23,500 risk points are targeted for mitigation by the end of FY23.

FUTURE CONSIDERATIONS

- Sugar Creek near Bangor Road
- Stewart Creek and Prince Street
- Sugar Creek at McDowell Farms
- Briar Creek at Ruth Drive
- Sugar Creek in Pineville
- Irwin Creek near Spruce Street

✓ Sky views of McDowell Farms





^ Stewart Creek Stream Enhancement Project

Future Water Quality

The goal of the WQ-CIP during FY24 will be the restoration of a cumulative 8.4 miles of stream restoration. Efforts will focus on beginning design on 3-4 projects and bid construction contracts for 4 or more projects. Staff have reviewed SRRS field scores collected in FY23 and will begin feasibility on 7 projects in FY24. SRRS field assessments will continue at a rate of approximately 20 reaches per year. Selection of SRRS reaches for field assessment is based upon SRRS desktop scores, grant opportunities, partnership opportunities, service requests and property considerations.

FUTURE CONSIDERATIONS

- South Prong Clark Creek David B. Waymer Park
- Mallard Creek at Kirk Farm Fields Park
- Mallard Creek near David Taylor Drive
- Toby Creek upstream of UNCC
- Reed Creek downstream of Reedy Creek Nature Preserve
- Swan Run at Sharon View Road
- Four Mile Creek at Raintree



^ Stevens Creek, riffles and pools

Going forward, miles completed will be reported based on the percent complete of the construction contract to better align with construction activity and spending.



^ Flooding along Briar Creek at Dunlavin Way

CIP Emergency Rainy Day Fund

To plan for future disasters, CMSWS completed a failure funding analysis of CIP program. The analysis was based upon a series of Monte Carlo simulations that evaluated both the likelihood of the failure of a previously constructed stream restoration project as well as a significant flood event resulting in the activation of a 'Quick-Buy' funding approach. For the water quality CIP, each of the previously constructed stream projects was evaluated for potential failure through projections of failure rates over time. The 'Quick-Buy' program was evaluated using the value of building stock likely to be impacted during specific flood events (2, 5, 10, 25, 50, 100 and 500-year events). From the analysis, an emergency funding allocation of \$5.0 million was recommended for both the water quality and flood mitigation CIP. CMSWS will evaluate the emergency funding allocation on an annual basis and modify as necessary.

CURRENT RAINY-DAY FUND

- \$500,000

RAINY-DAY FUND GOALS

- Water Quality - \$1.9M
- Flood Mitigation - \$3.1M
- Closed System Emergency Repair - \$750,000
- Fixed Fee Reserve - \$650,000



^ Flooding at Riverside Dr. and the Catawba River

