



RESOURCE  
INSTITUTE

*Restoring America's Streams,  
Rivers and Wetlands*

2020  
ANNUAL  
REPORT



# JOIN US IN NASHVILLE!



## Resource Institute hosts the First National Stream Restoration Conference

August 1-3, 2022

Gaylord Opryland Resort, Nashville, TN

STREAM RESTORATION 2022:  
SHARING VISIONS FOR THE FUTURE

- Over 140 presentations from industry experts
- Evolve your perspective beyond the channel
- Over 50 vendors and exhibitors with the latest technology and equipment
- Enjoy Music City – fantastic music, fabulous food
- Explore the Gaylord – don't miss its exciting line-up of family-friendly activities and entertainment



## Message from the Chair

BY KENNON (KEN) WHITE

*Because no matter who we are or where we come from, we're all entitled to the basic human rights of clean air to breathe, clean water to drink, and healthy land to call home.*

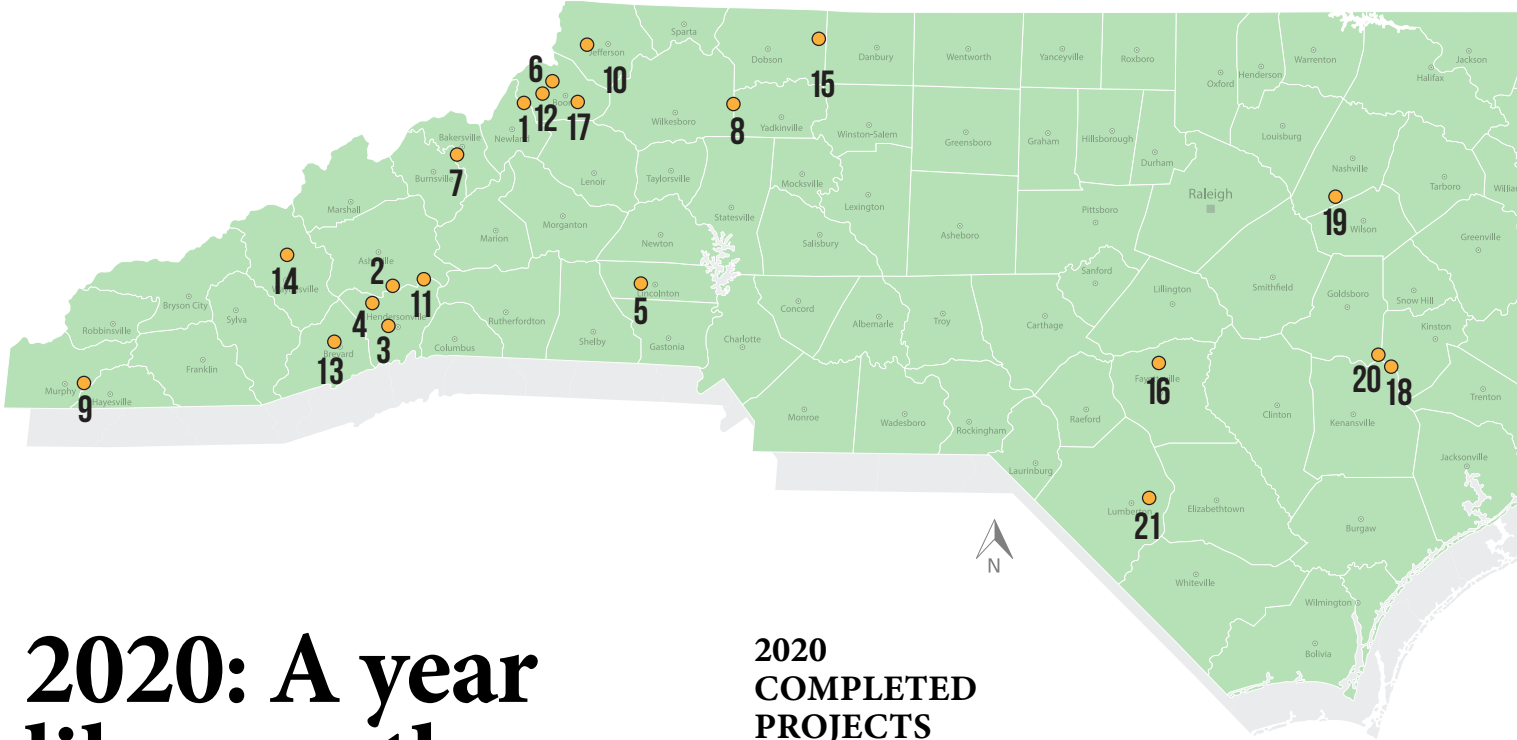
~ Martin Luther King, III



2020 was a tragic and challenging year for the US and the world. Despite the hardships of 2020, RI was blessed to bring several projects to fruition. Many of RI's restoration projects are quite complex. The average project takes three years to complete—from concept, assessment, grant application, design, construction, and planting. RI completed 21 restoration projects in 2020! Under these projects, RI restored 34,000 linear feet of streams and 7 acres of agricultural ponds. As part of these projects, RI and its partners planted 12,560 trees and 37,440 shrubs and plants. These plantings will sequester 500 tons of carbon within 10 years. During RI's 20-year history, it has planted 480,000 trees and 5.7 million shrubs! Over ten years, these plantings will sequester 39,848 tons of carbon.

These projects not only reduce pollution but bring a host of other benefits to the local communities. These projects result in cleaner, safer drinking water. The projects protect property and often safeguard critical infrastructure. The projects also improve habitat and fisheries bringing new recreation and education opportunities to locals and visitors. RI is adamant that each project improves the local citizens' quality of life.

Thank you so much to all our partners – communities, municipalities, government agencies, nonprofits, and private companies. Through these unique alliances, RI will continue to restore America's streams, rivers, and wetlands.



# 2020: A year like no other

In defiance of the challenges of 2020, RI completed 21 multi-year projects! These projects restored over 34,000 feet of stream.

How do we do this? RI cultivated strategic alliances with select engineering firms and construction firms. All of RI’s implementation partners have ample experience in Natural Channel Design methodology.

Natural Channel Restoration uses sustainable river engineering technologies to improve natural stream stability and habitat functions. This holistic approach produces extensive benefits – flood resiliency, improved water quality, habitat, fisheries, recreation opportunities, increased property values, and other economic benefits.

## 2020 COMPLETED PROJECTS

### Stream Restorations Projects

County – Stream Name	Feet
1 Avery – Elk River	1,400
2 Buncombe – Robinson Creek	1,650
3 Henderson – Shaw Creek	885
4 Henderson – UT Foster	1,800
5 Lincoln – Leonard Fork Creek	1,500
6 Watauga – Linville Creek	2,500
7 Yancey – Little Crabtree/N. Toe River	3,300
8 Yadkin – UT Swan Creek	1,900
9 Cherokee – Little Brasstown Creek	1,725
10 Ashe – Call Creek	3,800
11 Henderson – Reedy Patch	850
12 Watauga – Dutch Creek	1,000
13 Transylvania – Cathey's Creek	1,000
14 Haywood – Stingy Branch	1,500
15 Surry – Grassy Creek	4,500
16 Cumberland – UT Cape Fear	3,200
17 Watauga – Payne Branch	1,500
<b>TOTAL</b>	<b>34,010</b>

### NCDA Ponds

County	Number
18 Duplin	1
19 Nash	1
20 Lenoir	1
21 Robeson	1
<b>TOTAL</b>	<b>4</b>



# UPPER ELK RIVER

*This reach of the Upper Elk River was unstable due to severely eroding streambanks and reduced/impaired habitat.*

Tributary of the Watauga River  
Avery County, Banner Elk, NC

Status: Complete  
Stream Restored: ~1,400 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- North Carolina Division of Water Resources
- Avery Soil & Water Conservation District
- Wildlands Engineering
- Yadkin Valley Construction

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Resource Institute restored a reach of the Upper Elk River near Banner Elk, NC. The project is part of the North Carolina Stream Restoration Initiative.*



*One of the goals of the Upper Elk River project is to create a riparian buffer. The buffer will help stabilize the streambank and enhance habitat.*



*The Upper Elk River restoration project will contribute to clean water by reducing tons of sediment in the stream each year.*



*BEFORE: A reach of the Upper Elk River prior to restoration.*





*Robinson Creek experienced eroding streambanks and an unstable stream channel as well as an impaired/reduced habitat.*



*The Robinson Creek project employed several Natural Channel Design techniques. The project team realigned the channel and excavated the floodplain. They also installed log j-hook vanes, toe wood revetments, and cobble riffles.*



*The project team also created a riparian buffer zone by installing a coir mat, sod, and shrub transplants.*



*BEFORE:  
Robinson  
Creek prior to  
restoration.*

# ROBINSON CREEK

*Robinson Creek experienced eroding streambanks and an unstable stream channel as well as an impaired/reduced habitat.*

Tributary of the French Broad River  
Watershed – Newfound Creek Watershed  
Buncombe County, Fletcher, NC

Status: Complete  
Stream Restored: ~1,650 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Division of Water Resources
- Buncombe Soil & Water Conservation District
- Jennings Environmental, PLLC
- North State Environmental

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



# SHAW CREEK

*Multiple severe out of bank flooding events... streambank erosion, significant land loss, and reduced crop production after each rain event.*

Tributary of the French Broad River  
Henderson County, Hendersonville, NC

Status: Complete  
Stream Restored: ~885 feet

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**PARTNERS:**

- Veterans Healing Farm
- USDA-NRCS
- North Carolina Land & Water Fund
- North Carolina Division of Water Resources
- Henderson Soil & Water Conservation District
- Wildlands Engineering
- Suttles Grading

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**PROJECT OBJECTIVES:**

- Floodplain and bench construction and enhancements
- Install in-stream structures
- Reduce stress on the banks and maintain channel stability
- Introduction of buffer plantings and removal of invasive species
- Remove at-risk trees from streambanks and replanted along banks and floodplain
- Plant over 3,000 native species trees and shrubs
- Plant elderberry for medicinal purposes
- Transplant river cane, a plant that has cultural significance with the Cherokee nation and may supply materials for future Veterans Healing Farm endeavors



*Shaw Creek in Henderson County, North Carolina after in-stream construction*



*The project team planted a riparian buffer on Shaw Creek after instream construction is complete. The buffer is enhanced with Elderberry that the Farm will use for medicinal purposes.*

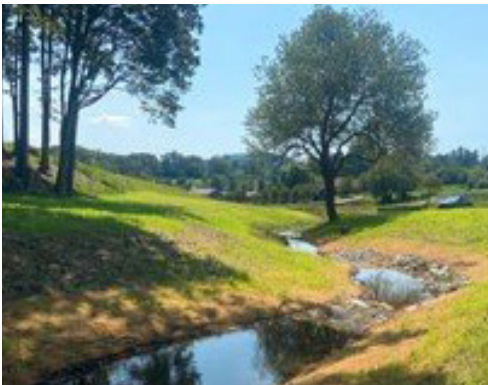


*BEFORE: Shaw Creek was eroding and overrun with invasive species. In particular, kudzu and Japanese knotweed were choking out and preventing more desirable native trees and shrubs from growing.*



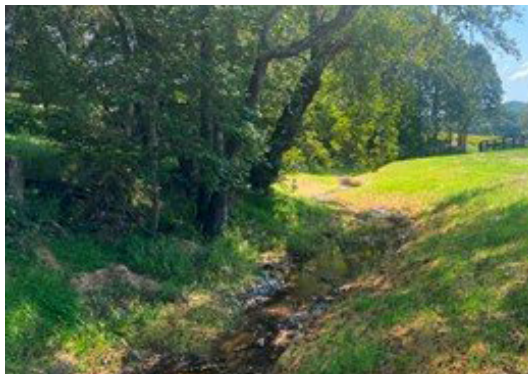


*UT Foster Creek located in Henderson County, North Carolina after in-stream construction.*



*The project team will a riparian buffer on UT Forster Creek after instream construction is complete.*

*A restored reach of UT Foster Creek immediately following in-stream construction.*



*BEFORE: Originally, UT Foster Creek's severely eroding streambanks contributed to a high sediment load and poor water quality.*

## UNNAMED TRIBUTARY OF FOSTER CREEK

*This Unnamed Tributary of Foster Creek is a headwater stream that suffered from critical erosion and incised streambanks.*

Tributary of the Mills River  
Henderson County, Mills River, NC

Status: Complete  
Stream Restored: ~1,800 feet

### PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- Henderson Soil & Water Conservation District
- Jennings Environmental, PLLC
- Belflower Farm, LLC

### PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggravation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Provide an alternate watering source for livestock that includes pump and livestock pipeline to convey water to watering facilities with surrounding heavy use area protection

Install fencing to restrict livestock access to the stream corridor to protect streambanks and streambank vegetation

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion

Remove barriers to provide an opportunity for the aquatic organisms to access additional habitat and migrate up and downstream

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



# LEONARD FORK CREEK

*Leonard Creek's banks were eroding, causing significant land and soil loss for the land-owner. It also lacked an adequate riparian buffer as well as aquatic habitat.*

Watershed – Lower Indian Creek  
Lincoln County, Bostic, NC

Status: Complete  
Stream Restored: ~1,500 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Division of Water Resources
- Lincoln Soil & Water Conservation District
- Jennings Environmental, PLLC
- Belflower Farms

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion

Remove barriers to provide an opportunity for the aquatic organisms to access additional habitat and migrate up and downstream

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Leonard Creek stream restoration project after planting the riparian buffer.*



*BEFORE: Prior to restoration, Leonard Creek's streambanks were steep and severely eroding and unstable.*



# LINVILLE CREEK

*Linville Creek was actively migrating, lacking proper dimension, pattern and profile. ... actively eroding and lacked a sufficient riparian buffer and aquatic habitat.*

Watershed – Cove Creek  
Watauga County, Vilas, NC

Status: Complete  
Stream Restored: ~2,500 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- North Carolina Division of Water Resources
- Watauga Soil & Water Conservation District
- Brushy Fork Environmental Consulting

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion

Remove barriers to provide an opportunity for the aquatic organisms to access additional habitat and migrate up and downstream

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Linville Creek stream restoration project after instream construction and planting the riparian buffer.*



*Instream structures constructed for the Linville Creek restoration project.*



*BEFORE: Linville Creek lacked stream crossings contributing to streambank and streambed erosion.*





*Little Crabtree Creek restoration during in-stream construction.*



*Instream structures just after construction on the Little Crabtree Creek restoration project.*



*BEFORE: Little Crabtree Creek lacked adequate dimension, pattern, and profile, increasing the sediment load.*

# LITTLE CRABTREE CREEK

*Little Crabtree Creek was actively migrating with an unstable channel bed and eroding streambanks. Additionally, it lacked sinuosity, a sufficient riparian buffer, and aquatic habitat.*

Watershed – North Toe River  
Yancey County, Burnsville, NC

Status: Complete  
Stream Restored: ~3,300 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- North Carolina Division of Water Resources
- Yancy Soil & Water Conservation District
- Brushy Fork Environmental

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Install fencing to restrict livestock access to the stream corridor to protect streambanks and streambank vegetation

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs





*The UT of Swan Creek restoration project stabilized the migrating stream and enhanced aquatic habitat.*



*Instream structures constructed for the UT Swan Creek restoration project.*



*BEFORE: Prior to restoration, UT Swan Creek's banks were eroding, reducing water.*

## UNNAMED TRIBUTARY OF SWAN CREEK

*The Unnamed Tributary to Swan Creek was actively migrating with an unstable channel bed and eroding streambanks.*

Watershed – Yadkin River  
Yadkin County, Yadkinville, NC

Status: Complete  
Stream Restored: ~1,900 feet

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### PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- North Carolina Division of Water Resources
- Yadkin Soil & Water Conservation District
- Ecosystem Planning & Restoration
- Yadkin Valley Construction

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### PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Provide an alternate watering source for livestock that includes pump and livestock pipeline to convey water to watering facilities with surrounding heavy use area protection

Install fencing to restrict livestock access to the stream corridor to protect streambanks and streambank vegetation

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion

Remove barriers to provide an opportunity for the aquatic organisms to access additional habitat and migrate up and downstream

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



# LITTLE BRASSTOWN CREEK

*This restoration project is located on a stream reach at the confluence of Garringer and Little Brasstown Creek. The stream reach was unstable and impaired from eroding streambanks.*

Tributary of the Hiwassee River  
Cherokee County, Brasstown, NC

Status: Complete  
Stream Restored: ~1,725 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Division of Water Resources
- Cherokee Soil & Water Conservation District
- Jennings Environmental, PLLC
- Penland Contracting

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Install fencing to restrict livestock access to the stream corridor to protect streambanks and streambank vegetation

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*This restoration project is located on a stream reach at the confluence of Garringer and Little Brasstown Creek.*



*The Little Brasstown project employed several Natural Channel Design techniques. The project team realigned the channel and excavated the floodplain. They also installed log j-hook vanes, toe wood revetments, and cobble riffles.*



*The project team also created a riparian buffer zone by planting temporary and permanent seed live stakes and bare roots.*



**BEFORE:**  
*Little Brasstown Creek prior to restoration.*



# CALL CREEK

*Call Creek is a headwater stream that suffered from critical erosion and incised streambanks.*

Tributary of the South Fork New River  
Ashe County, West Jefferson, NC

Status: Complete  
Stream Restored: ~3,800 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Division of Water Resources
- Brushy Fork Environmental Consulting
- North State Environmental

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Provide an alternate watering source for livestock that includes pump and livestock pipeline to convey water to watering facilities with surrounding heavy use area protection

Install fencing to restrict livestock access to the stream corridor to protect streambanks and streambank vegetation

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion

Remove barriers to provide an opportunity for the aquatic organisms to access additional habitat and migrate up and downstream

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Call Creek post-restoration with stabilized streambanks and reconnected floodplain.*



*A view of the in-stream structures installed on Call Creek. The in-stream structures will improve aquatic habitat.*



*The restoration project also improved Call Creek's dimension, pattern and profile to improve sediment transport.*



*BEFORE: Streambanks on Call Creek were steep and severely eroded.*





Reedy Patch Creek instream structures looking upstream, July 2020



*BEFORE:*  
Reedy Patch  
Creek's eroding  
streambanks  
prior to resto-  
ration.



*A restored reach  
of Reedy Patch  
Creek immedi-  
ately following  
in-stream con-  
struction.*

# REEDY PATCH CREEK

*Reedy Patch Creek experienced multiple physical, ecological, and biological impacts. The streambanks suffered critical erosion due to limited stabilizing vegetation. As a result, the creek widened excessively and was not adequately transporting sediment, causing significant downstream silt deposits.*

Tributary of the Broad River River  
Henderson County, Edneyville, NC

Status: Complete  
Stream Restored: ~850 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- Henderson Soil & Water Conservation District
- Jennings Environmental, PLLC
- North State Environmental

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



# DUTCH CREEK

*Dutch Creek was actively migrating, lacking proper dimension, pattern and profile.*

Watershed – Watauga River  
Watauga County, Valle Crucis, NC

Status: Complete  
Stream Restored: ~1,000 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- Watauga Soil & Water Conservation District
- Jennings Environmental, PLLC
- Brushy Fork Environmental Consulting

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Construct stream crossings to provide a travel way for people, livestock, equipment, or vehicles that will improve water quality by reducing streambank and streambed erosion.

Remove barriers to provide an opportunity for the aquatic organisms to access additional habitat and migrate up and downstream

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Dutch Creek stream restoration project after instream construction and just before planting the riparian buffer.*



*Dutch Creek restoration project just after establishing the riparian buffer.*



*BEFORE: Dutch Creek was actively migrating and lacked proper dimension, pattern, and profile, as well as riparian buffer and aquatic habitat.*





*Instream structures constructed to stabilize Catheys Creek above the City of Brevard Water Treatment Plant.*



*Aerial view of the Catheys Creek Project and the Brevard Water Treatment Plant. This view is after instream construction and prior to riparian planting.*



*BEFORE: Prior to restoration, Catheys Creeks streambanks were eroding causing the adjacent road to be unstable as well.*

# CATHEYS CREEK

*Prior to construction, the water intake pipe at Catheys Creek was located next to an eroding streambank along an unpaved road on U.S. Forest Service property. Sediment eroding from this unstable section of the creek often caused clogging in the pipe, threatening to disrupt the flow of clean water to the treatment plant.*

Tributary of the French Broad River  
Transylvania County, Brevard, NC

Status: Complete  
Stream Restored: ~1,000 feet

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## PARTNERS:

- The City of Brevard
- NC Depart of Water Infrastructure
- NC DEQ, Wildlife Resources Commission
- Jennings Environmental, PLLC
- Stream Mechanics

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Restore and stabilize streambanks

Relocate the water intake pipe upstream to a safe location away from sediment sources.

Stabilize adjacent road

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



# STINGY BRANCH

*Stingy Branch is a headwater stream that suffered from severe critical erosion and incised streambanks.*

Tributary of the Pigeon River  
Haywood County, Iron Duff, NC

Status: Complete  
Stream Restored: ~1,500 feet

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## PARTNERS:

- USDA-NRCS
- North Carolina Land & Water Fund
- Southwestern RC&D
- Jennings Environmental, PLLC
- Brushy Fork Environmental

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## PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Restore and stabilize streambanks

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs

Establish a 6.5-acre conservation easement donated by the landowner

Create a walking trail and footbridge

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Instream structures constructed to stabilize Stingy Branch and create aquatic habitat.*



*The Stingy Branch project sponsors donated 6.5 acres for conservation and established a walking trail with a footbridge.*



*BEFORE: Prior to restoration Stingy Branch's streambanks were severely eroded and the stream unstable.*



# GRASSY CREEK

*Although the water quality was good, Grassy Creek transported too much sediment due to significant erosion.*

Tributary of the Yadkin River  
 Surry County, Pilot Mountain State Park, NC

Status: Complete  
 Stream Restored: ~4,500 feet

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**PARTNERS:**

- Pilot Mountain State Park
- North Carolina Land & Water Fund
- Ecosystem Planning & Restoration
- North State Environmental

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**PROJECT OBJECTIVES:**

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Restore and stabilize streambanks

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*Instream structures constructed to stabilize Grassy Creek and create aquatic habitat.*



*The Grassy Creek at Pilot Mountain State Park during instream construction of the restoration project.*



## UNNAMED TRIBUTARY CAPE FEAR AT METHODIST UNIVERSITY RESTORATION PROJECT

*The creek was severely eroding and putting infrastructure at risk. The creek also damaged a footbridge that connected the main campus to the University's PGA Golf Program and Center.*

Watershed – Cape Fear River  
Cumberland County, Fayetteville, NC

Status: Complete  
Stream Restored: ~3,200 feet



*Unnamed Tributary at Methodist University after construction but prior to riparian planting.*



*As part of the UT Methodist University, project partners constructed a pedestrian bridge. The original bridge was damaged by severe storms. The bridge reconnects the main campus to the University's PGA Golf Program and Center.*

### PARTNERS:

- Methodist University
- North Carolina Land & Water Fund
- McAdams
- Jennings Environmental, PLLC

### PROJECT OBJECTIVES:

Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream and reduce streambank erosion

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Construct and install a pedestrian bridge to reconnect the main campus to the University's PGA Golf Program and Center

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs



*BEFORE: The creek was severely eroding and putting infrastructure at risk. High water from major hurricanes damaged a footbridge that connected the main campus to the University's PGA Golf Program and Center.*



# PAYNE BRANCH

*The old dam structure restricted stream-flow, causing increased stormwater flow and sediment levels, poor water quality, and reduced habitat.*

Tributary of the New River  
Watauga County, Boone, NC

Status: Complete  
Stream Restored: ~1,500 feet

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## PARTNERS:

- Appalachian State University
- New River Light & Power
- Clean Water Management Trust Fund
- Brushy Fork Environmental
- North State Environmental

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## PROJECT OBJECTIVES:

Remove decommissioned dam

Remove legacy excess sediment from dam

Stabilize the stream reach to prevent further aggradation or degradation by providing an improved dimension, pattern and/or profile that will improve sediment transport, and manage surface waters and groundwater levels in floodplains, riparian areas, and wetlands

Construct rock and woody structures to provide instream habitat, stabilize streambanks and the channel bed

Restore and stabilize streambanks

Relocate the water intake pipe upstream to a safe location away from sediment sources.

Establish a riparian buffer, remove invasive plant species and reestablish native plants, trees, and shrubs

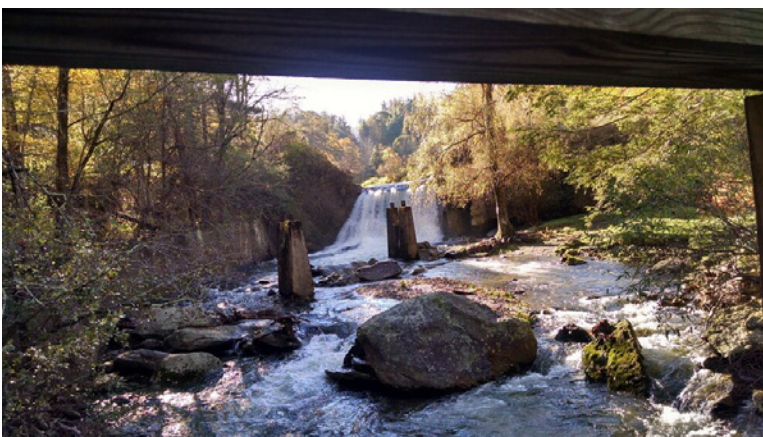
Reconnect and enhance the floodplain and ponds, and allow upstream fish passage for spawning



*Construction of a cross vane on Payne Branch as part of the restoration project.*



*A j-hook vane constructed upstream of the former dam site on Payne Branch.*



*BEFORE: The decommissioned New River Light and Power dam prior to restoration on Payne Branch.*



# Hurricane Matthew Disaster Relief

*In 2016, Hurricane Matthew ripped through the Caribbean and the US East Coast. Hurricane Matthew damaged or destroyed as many as 98,000 homes in Eastern North Carolina and nearly 20,000 businesses. It also damaged roads, water supply, and waste treatment systems.*

NC Department of Agriculture & Consumer Services launched a multi-partner program aimed at restoring and repairing agricultural ponds damaged by the high winds and flooding of Hurricane Matthew.

This ongoing project aids farmers whose agricultural ponds were breached during the natural disaster.

Resource Institute completed 4 projects under the Hurricane Matthew Disaster Relief Program in 2019. RI repaired approximately 6.75 acres of agricultural ponds.

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**PARTNER:**

- North Carolina Department of Agriculture & Consumer Services
- 

**PROJECTS:**

- Duplin County – UT Great Branch
- Nash County – UT Toisnot Swamp
- Lenoir County – UT Panther Creek
- Robeson County – UT Jackson Swamp



*This agriculture pond sustained extensive damage from hurricanes in 2016. It was restored by Resource Institute under a program from the NC Department of Agriculture & Consumer Services.*



*Agriculture pond in Eastern North Carolina post-restoration from damage in 2016.*



*A number of agriculture ponds in Eastern North Carolina were damaged by hurricanes in 2016. This pond's dam was breached during the storms.*



*A pond in Eastern North Carolina severely damaged by hurricanes in 2016.*



# Work in progress

RI is excited about 2021! Twenty-five projects are nearing completion. The projects will be constructed in the Spring through Summer, with final riparian plantings in the late Fall and early Winter.

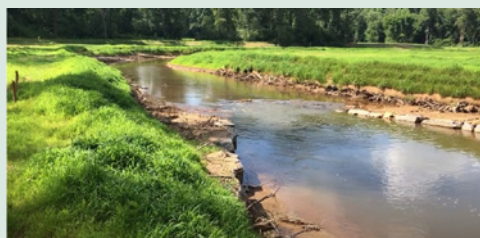
Almost 50,000 linear feet of stream will be enhanced and restored. Restoring and stabilizing these streams makes a massive difference in the lives of the landowners and communities. The restoration will improve flood resiliency and enhance water quality. New recreation opportunities advance community health and economic opportunities.



*Ivy Creek project - The confluence of California, Paint Fork, and Little Ivy creeks in Mars Hill, immediately after undergoing stream restoration.*



*RI is working with Surry County to address streams damaged by large storm events. The work is being completed under NRCS's Emergency Watershed Protection Program (EWP).*



*RI is working to restore and stabilize 3,500 feet of Big Elkin Creek. This project will also improve water quality for the City of Elkin.*

## 2021 PROJECTS

County – Stream Name	Feet
Avery County – Squirrel/Bartlett Farmer Creeks	1,500
Buncombe County – Swannanoa River	3,265
Cherokee County – Valley River	700
Cleveland County – Pounding Mill Creek	3,175
Henderson County – Foster Creek	3,100
Henderson County – Crab Creek	785
Macon County – Bates Branch	3,000
Macon County – Nantahala River	2,750
Madison County – Ivey Creek	1,725
Rutherford County – Cleghorn Creek	1,770
Rutherford County – UT Second Broad	2,700
Rutherford County – Cedar Creek	2,700
Surry County – UT Little Fisher	1,900
Surry County – Hodges Creek	2,700
Surry County – UT Cooks Creek	1,250
Surry County – UT Ararat River	500
Watauga County – Cove Creek	2,200
Robeson County – Raft Swamp	30,000
Rutherford County – Cleghorn Creek	2,000
Surry County – Ararat River	2,700
Surry County – Horne Creek Tribs.	2,000
Surry County/Town of Pilot Mountain – Chinquapin Creek	1,700
Surry County, – Big Elkin Creek	3,500
Surry County – Fisher River (EWP)	350
Surry County – Mitchell River	1,500
Watauga County – Linville Creek	5,870
<b>TOTAL</b>	<b>85,340</b>

NCDA PONDS	NUMBER
Duplin – UT Great Branch	1
Sampson – UT Big Swamp	1

PONDS	
Surry, Cedarbrook CC – Camp Creek	1

GREENWAYS	FEET
Surry, Mt Airy – Ararat River	5,000





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