

East Fork – South Fork New River

Watershed Plan

New River Conservancy

December 2017



Partners:



Contents

1	Context	4
2	Watershed overview	7
2.1	Land use and land cover	7
2.2	Watershed significance	9
2.2.1	Element occurrences	11
3	Baseline watershed information and monitoring needs	13
4	Field assessments	14
5	Recommended best management practices	29
6	Plan implementation	33
6.1	Technical and financial assistance	33
6.2	Prioritization	34
6.3	Educational opportunities	34
6.4	Project phasing	35
7	Conclusion	36
8	References	37
9	Appendix	38

Executive summary

The purpose of the East Fork Watershed Plan is to promote restoration efforts and improve water quality in the East Fork of the South Fork New River Watershed in Watauga County, North Carolina. The East Fork Watershed plan is supported by Watauga County, the town of Boone, and the High Country Council of Governments, with the composition of the document being completed by employees of the New River Conservancy.

The East Fork–South Fork New River flows for 3.25 miles, originating along the eastern continental divide in southeastern Watauga County. The East Fork received a Fair bioclassification following benthic macroinvertebrate surveys conducted in 2003. This resulted in the uppermost 1.95 miles of the river being designated as impaired, which indicates that the river does not adequately support aquatic life. The watershed contributing to the impaired reach of the East Fork covers 3,833 acres, which are located entirely within Watauga County. The watershed is approximately 60% forested, although agriculture and low density residential areas are also abundant. Paved and unpaved roads are routed in close proximity to streams throughout the watershed. The watershed contains many high quality streams which are used for recreational, residential, and agricultural purposes. However, the region also experiences long-term nonpoint source pollution impacts associated in part with degraded riparian vegetation and stormwater runoff.

Aside from macroinvertebrate surveys, water quality data has not been collected in the area contributing to the impaired reach since the 1970s, so problem areas and sources of pollution were identified with GIS analysis. Establishing a water quality monitoring program is a major priority of this plan so that the data collected can be used to provide evidence of the most significant problem areas and demonstrate measurable results from watershed improvement projects. This plan aims to inspire future volunteers within the community and highlight engagement with the public in improving water quality.

1 Context

The South Fork New River is one of two major tributaries forming the New River. The river flows for 89.2 miles from its headwaters in southern Watauga County before forming the New River proper at the confluence with the North Fork in northern Ashe County. The South Fork forms at the confluence of the East and Middle forks of the South Fork within the town of Boone. Within the 22,000 acre Headwaters South Fork Watershed (HUC 050500010201), the South Fork carries a C+ classification from the NC Department of Environmental Quality Division of Water Resources (NCDEQ-DWR). The C designation protects the propagation, survival, and maintenance of biological integrity of aquatic life of the river, as well as secondary recreation, fishing, and fish consumption uses. The ”+” classification identifies the South Fork as subject to special management strategy in order to protect reaches of the river downstream designated as Outstanding Resource Waters (ORW).

The East Fork – South Fork New River flows for 3.25 miles, originating along the eastern continental divide in southeastern Watauga County. The uppermost 1.95 miles of the East Fork is listed as impaired by DWR (Figure 1). The impaired title is given to waters that do not meet water quality standards outlined in section 303(d) of the Clean Water Act. Waters designated as impaired are prioritized and managed with the goal of meeting water quality standards. The East Fork’s impairment is the result of benthic macroinvertebrate surveys conducted by DWR in 2003 in which the stream received a Fair bioclassification, indicating that the stream does not adequately support a healthy macroinvertebrate community. The East Fork has been on the 303(d) list since 2008. No TMDL has been developed for the watershed.

The East Fork’s impairment is influenced by nonpoint source pollution associated with poor management practices taking place within the watershed. Specifically, reaches of the East Fork lacking riparian buffer experience increased rates of streambank erosion and are at a greater risk of thermal pollution. High sediment loads due to stormwater runoff and bank erosion negatively impact aquatic communities and is a possible explanation for the impairment. Agricultural land within the watershed can contribute excess nutrients to the

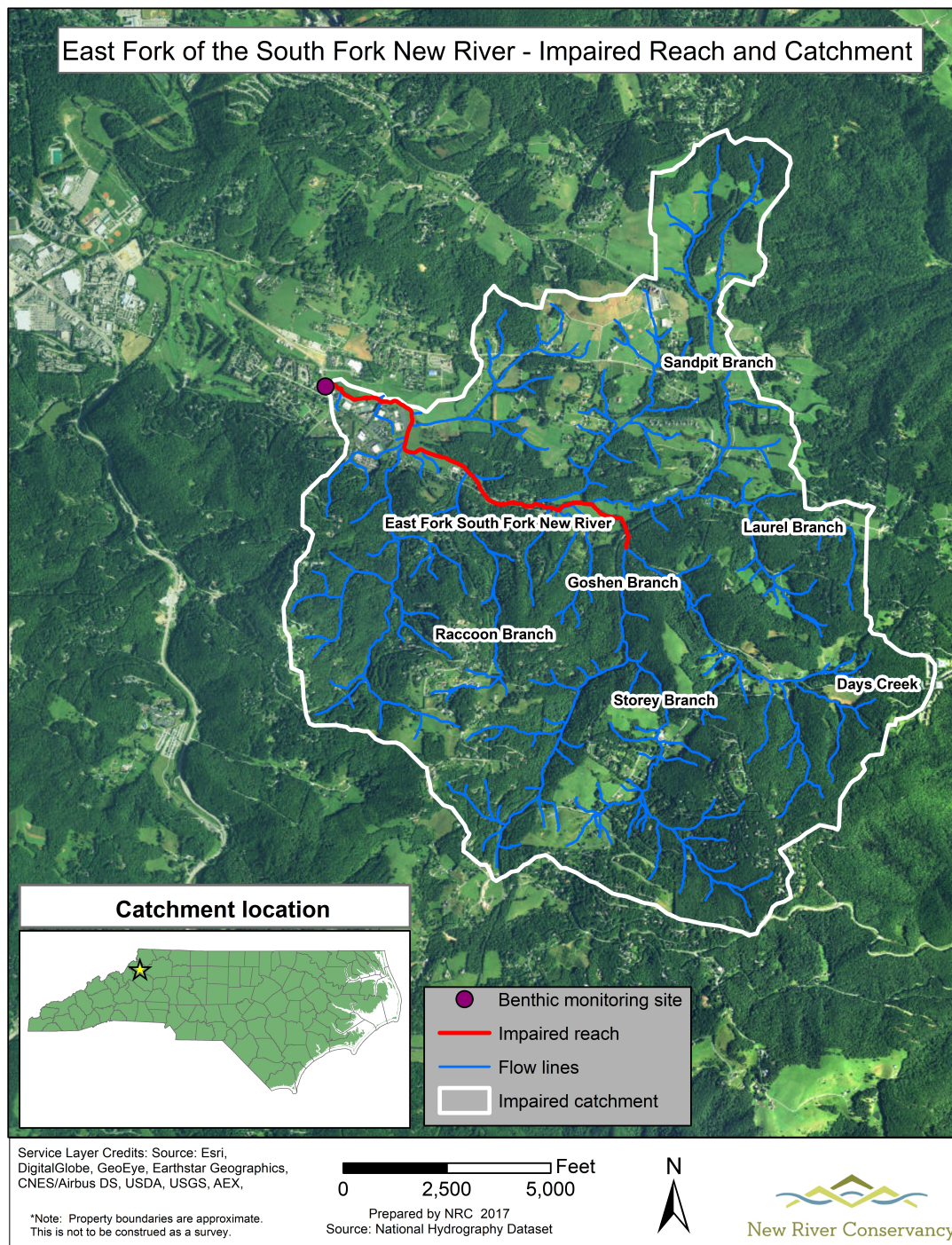


Figure 1: Overview of the East Fork Watershed

stream from fertilizers and pesticides. Much of the East Fork flows in close proximity to Bamboo Road and other secondary roads, which convey agricultural runoff as well as sediment,

metals, and petroleum. The type, source, and best management practices for addressing pollutants will be outlined in this plan.

Purpose

New River Conservancy is a non-profit organization with a mission to protect the waters, woodlands, and wildlife of the New River Watershed. With the support and aid of its partners, the development of a watershed plan works toward achieving this mission. This plan provides a guide for removing the East Fork from the impaired waters list. The plan identifies sources of pollution in the watershed and identifies solutions which will enhance the ecological function and associated ecosystem services and economic value of the East Fork Watershed.

2 Watershed overview

2.1 Land use and land cover

The Headwaters South Fork Watershed covers over 22,000 acres consisting of mixed land covers (Table 1). Of the Headwaters South Fork Watershed, the catchment contributing to the impaired reach of the East Fork has an area of 3,833 acres. Forest cover comprises 60.43% of this catchment’s total area. Developed land cover is primarily open space and total impervious surfaces account for 19.4% of total cover. The development in the catchment is primarily comprised of residential units as well as the Samaritan’s Purse property.

Table 1: land cover classes covering the East Fork Watershed and within a 300 foot buffer of the impaired reach

Land cover class	Watershed	Buffer
Forested	60.43%	30.20%
Developed, Open Space	17.79%	24.23%
Developed, Low Intensity	1.06%	4.78%
Developed, Medium Intensity	0.55%	3.41%
Developed, High Intensity	0.04%	0.34%
Pasture/Hay	17.60%	37.03%
Other	2.54%	0.00%

Impervious surfaces are primarily concentrated along the East Fork on the downstream end of the impaired reach, as indicated by greater presence of developed land cover within 300 ft of the impaired reach. Developed land classes make up 32.76% of the buffer, while Pasture/Hay comprises 37.03%. Compared to the rest of the East Fork Watershed, the 300 ft buffer surrounding the impaired reach is composed of only 30.2% forest, substantially less than the 60.4% that covers the rest of the watershed.

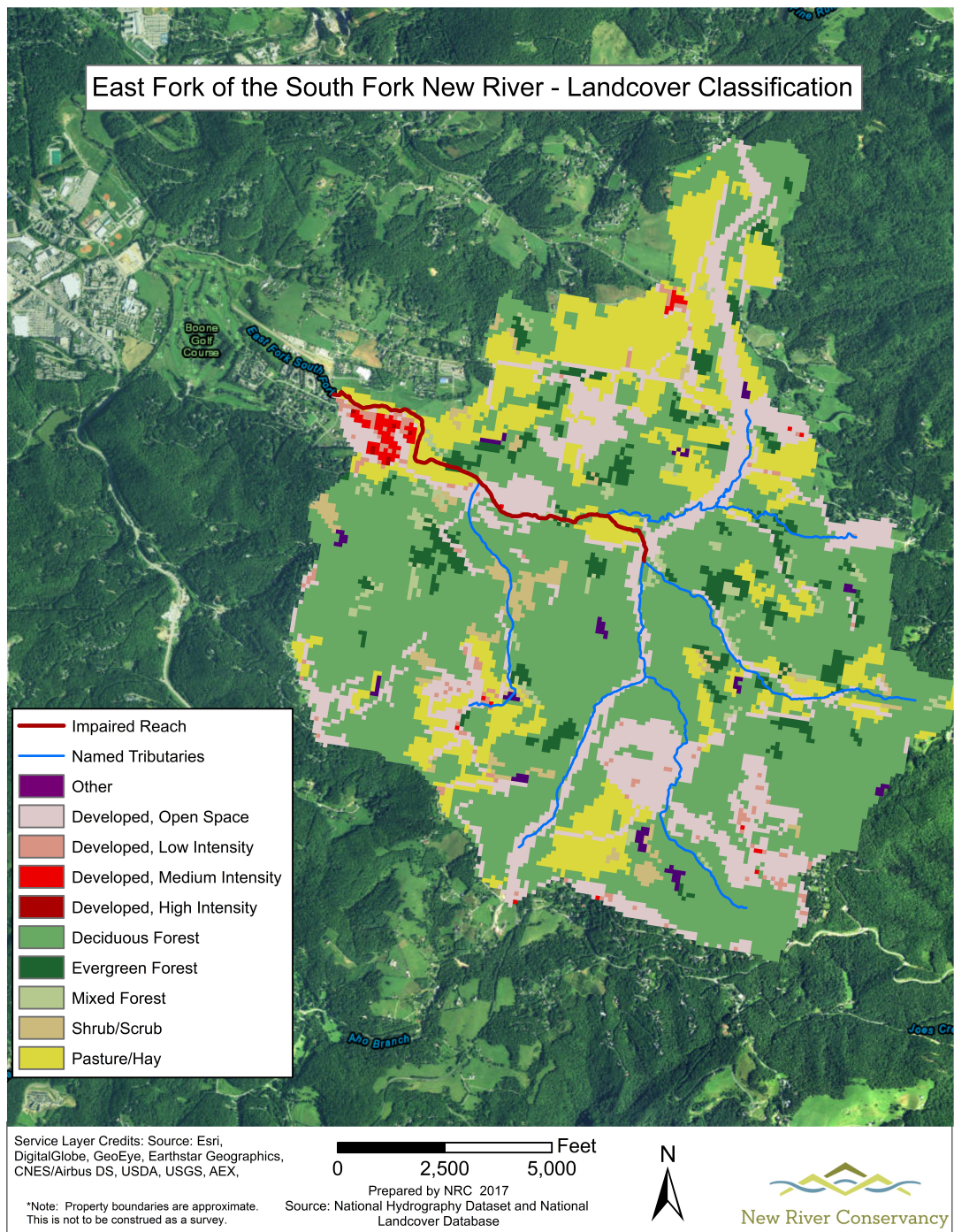


Figure 2: Land cover classifications

2.2 Watershed significance

The East Fork has considerable economic and recreational benefits for Watauga County, the town of Boone, and the New River Watershed. A number of streams within the New River Watershed in Watauga County support populations of trout and are a popular destination for anglers. Similarly, the river is a major recreational hub for tourists, who generated an economic impact of roughly \$231.44 million in Watauga County during 2015 (Visit North Carolina, 2015). The East Fork Watershed is crossed by the Blue Ridge Parkway, which is consistently among the most visited units within the National Park system, attracting over 15,000,000 visitors in 2015, more than Grand Canyon and Yellowstone National Parks combined. As a destination for tourism, this watershed sees an influx of visitors on an annual basis, benefitting those living and working within the watershed. The tourism industry in Watauga County alone employs more than 2,600 people each year, making the watershed an important economic hub for the region.

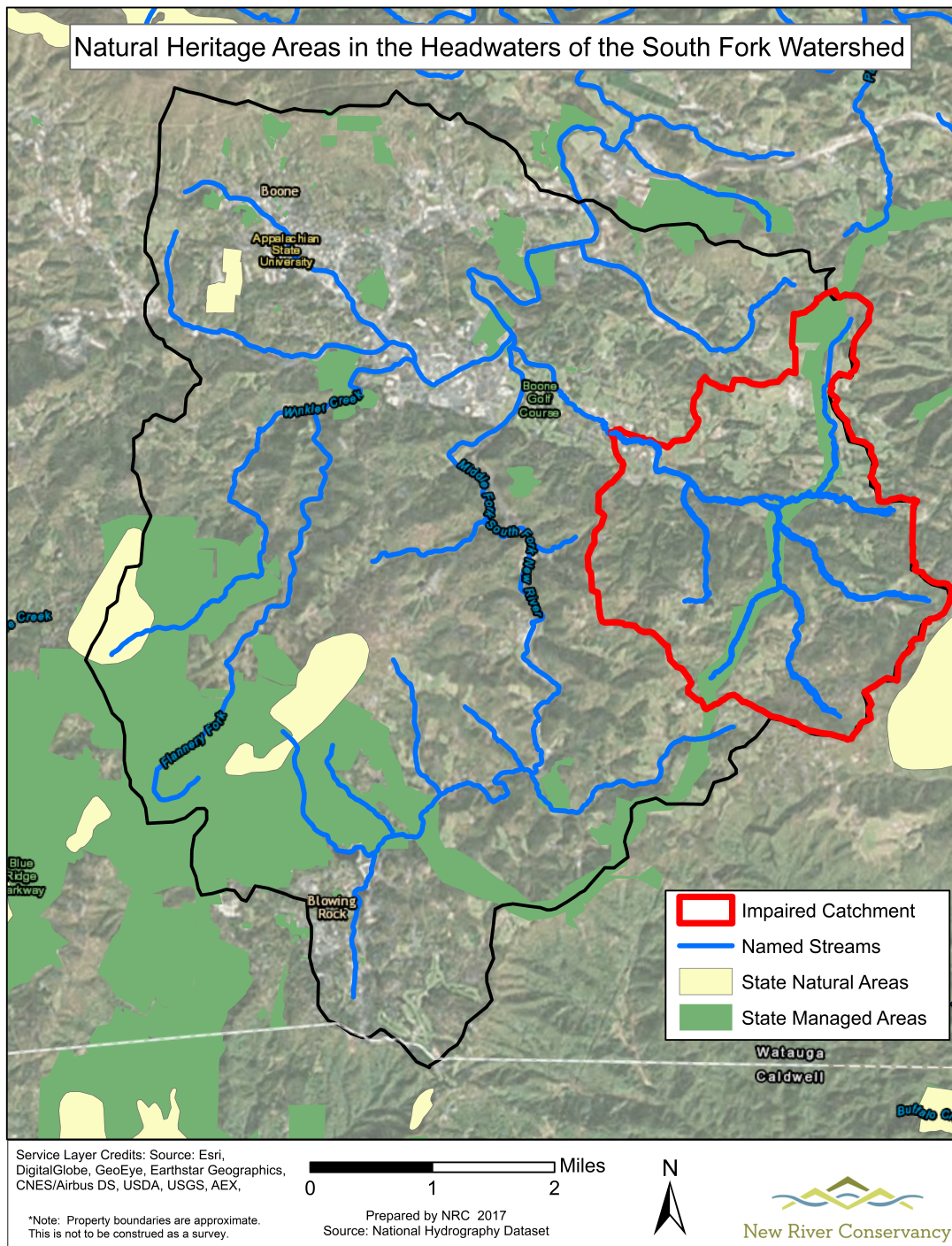







Figure 3: Natural heritage areas in the East Fork Watershed

2.2.1 Element occurrences

The North Carolina Natural Heritage program collects information on occurrences of rare plants, animals, natural communities, and animal assemblages, which are referred to as "elements". Locations of elements are known as "Element Occurrences" (EOs). Five EO species are located within the area contributing to the impaired reach of the East Fork, including the Gray Comma (*Polygonia progne*) and Bobolink (*Dolichonyx oryzivorus*), which are considered critically impaired in North Carolina (Table 2). Protecting the rare and threatened species of the East Fork Watershed should be a priority in environmental planning.

Table 2: Element occurrences in the East Fork Watershed

SCIENTIFIC NAME	COMMON NAME	Photo Identification	NC STATE STATUS	NC STATE RANK
<i>Polygonia progne</i>	Gray Comma		SR	S1
<i>Exoglossum laurae</i>	Tonguetied Minnow		SR	S2
<i>Passerculus sandwichensis</i>	Savannah Sparrow		SR	S2B,S5N
<i>Dolichonyx oryzivorus</i>	Bobolink		SR	S1B
<i>Epilobium ciliatum</i> ssp. <i>Ciliatum</i>	American Willowherb		SR-P	S2

SR - Significantly Rare: Any species which has not been listed by the N.C. Wildlife Resources Commission as an Endangered, Threatened, or Special Concern species, but which exists in the state in small numbers and has been determined by the N.C. Natural Heritage Program to need monitoring. Significantly Rare species include "peripheral" species, whereby North Carolina lies at the periphery of the species' range, as well as species of historical occurrence with some likelihood of re-discovery in the state.

SR-P – Peripheral: The species is at the periphery of its range in North Carolina. These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats which are unusual in North Carolina.

S1 – Critically imperiled in North Carolina due to extreme rarity or some factor(s) making it especially vulnerable to extirpation (local extinction) from the state. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

S2 – Imperiled in North Carolina due to rarity or some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

S5 – Secure: Common, widespread, and abundant in North Carolina. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

B – Breeding: Rank of breeding population in North Carolina. Used for migratory species only.

N – Nonbreeding: Rank of non-breeding population in North Carolina. Used for migratory species

3 Baseline watershed information and monitoring needs

Establishing a water quality monitoring program is a key component of the watershed plan. Water quality data is necessary in order to characterize the current conditions within the East Fork Watershed and to assess the effectiveness of BMP implementation. Chemical data has not been collected in the East Fork Watershed since the 1970s, so establishing a water quality monitoring program is necessary. Monitoring will be performed prior to the implementation of BMPs in order to establish a baseline that can be used to evaluate the effectiveness of BMPs and to make further recommendations.

New River Conservancy maintains a volunteer citizen quality monitoring program, New River Water Watchers (NRWW), which will be used to monitor water quality in the East Fork Watershed. NRWW monitors measure dissolved oxygen, pH, water temperature, fecal coliform/*E. coli*, and water transparency monthly using state-approved procedures. Ideally, monitors will measure immediately downstream of the impaired reach and upstream of BMP locations. Supplemental monitoring will be provided by NRC staff in order to increase the number of monitoring stations in the watershed if needed. Additional parameters, including nutrient concentrations, will also be monitored as the NRWW program is incorporated into the North Carolina Aquatic Data Hub (NCADH). NCADH is an NRC-led project to connect monitoring efforts throughout the state and to make citizen data more useful to data users at the state, county, and local level. Monitors in the East Fork Watershed will be incorporated into NCADH as early as 2018.

In the past, NRC has partnered with Appalachian State University and North Carolina State Park staff to carry out benthic macroinvertebrate monitoring at project sites in the New River Watershed, and will continue to leverage them to provide supplemental macroinvertebrate surveys in the East Fork.

4 Field assessments

In order to better understand the practices contributing to the East Fork’s impairment, general field assessments were conducted during March and June 2017. Assessments focused on identifying sources of pollution and determining where BMPs should be implemented. The sites visited for field assessments were selected based on landcover analysis and visual analysis of satellite imagery. Sites with degraded riparian buffer and concentrated impervious surface near streams were priorities for site visits (Figure 4).

Additional priorities for field assessments were determined using the Universal Soil Loss Equation (USLE). An empirical model originally used to calculate agricultural soil loss rates, USLE has also been widely used for conservation purposes. With USLE, soil loss rates are calculated as the product of rainfall, runoff, soil erodibility, slope length/slope steepness, and landcover factors (Hickey, 2000). In the East Fork Watershed, average tons of soil loss per 30 m grid cell were calculated in order to identify sites vulnerable to bank erosion (Figure 5). Sites with high soil loss potential along streams and not under forest cover were visited and assessed.

During the field assessments, the project team noted the following detrimental land use practices:

- Reaches lacking riparian buffer due to mowing and the removal of trees and shrubs. Invasive species presence in existing buffers.
- Poor stormwater management practices, including poorly placed pipes and culverts as well as impervious surfaces directly conveying runoff to streams.
- Channel straightening and flow confinement.

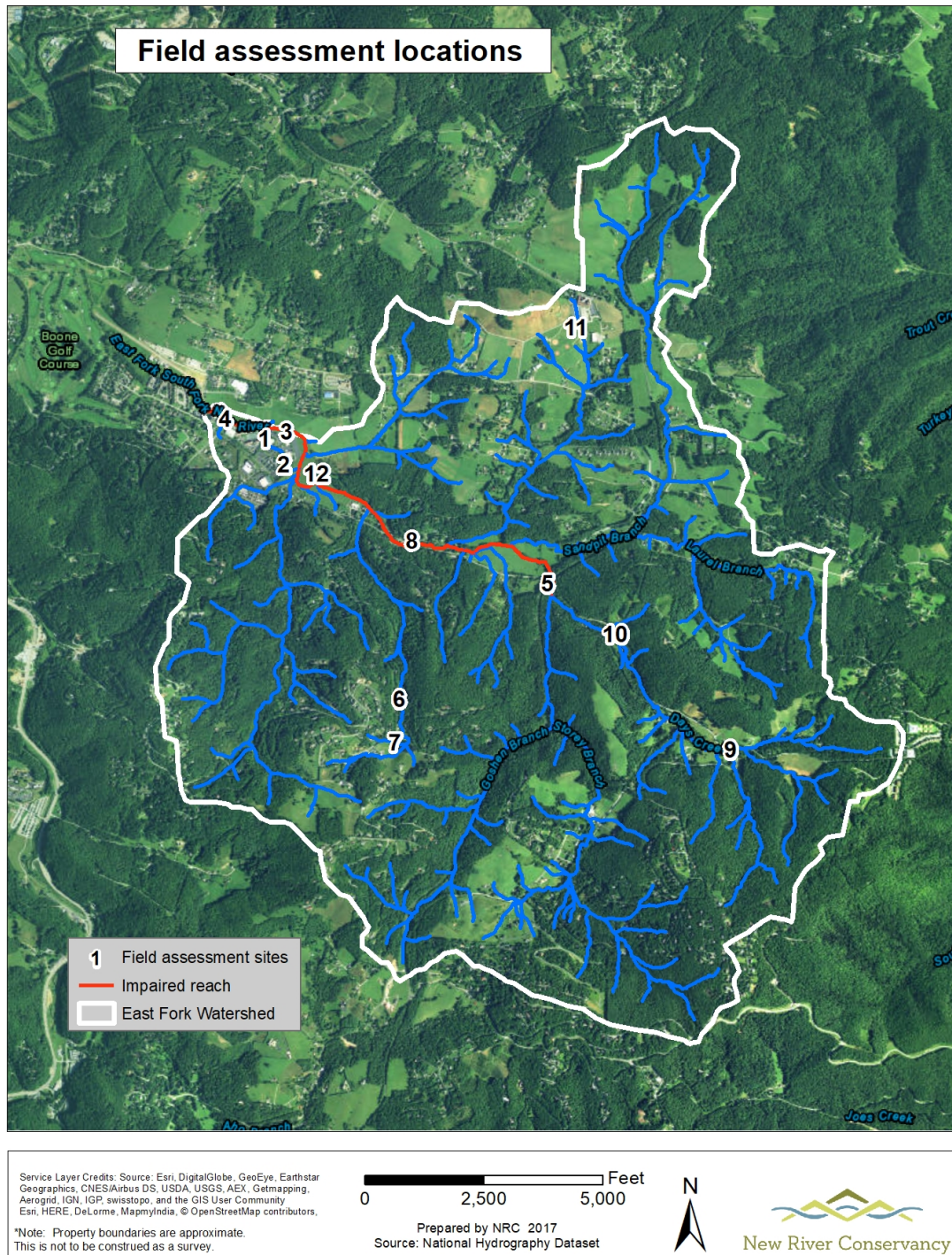


Figure 4: Field assessment locations in the East Fork Watershed

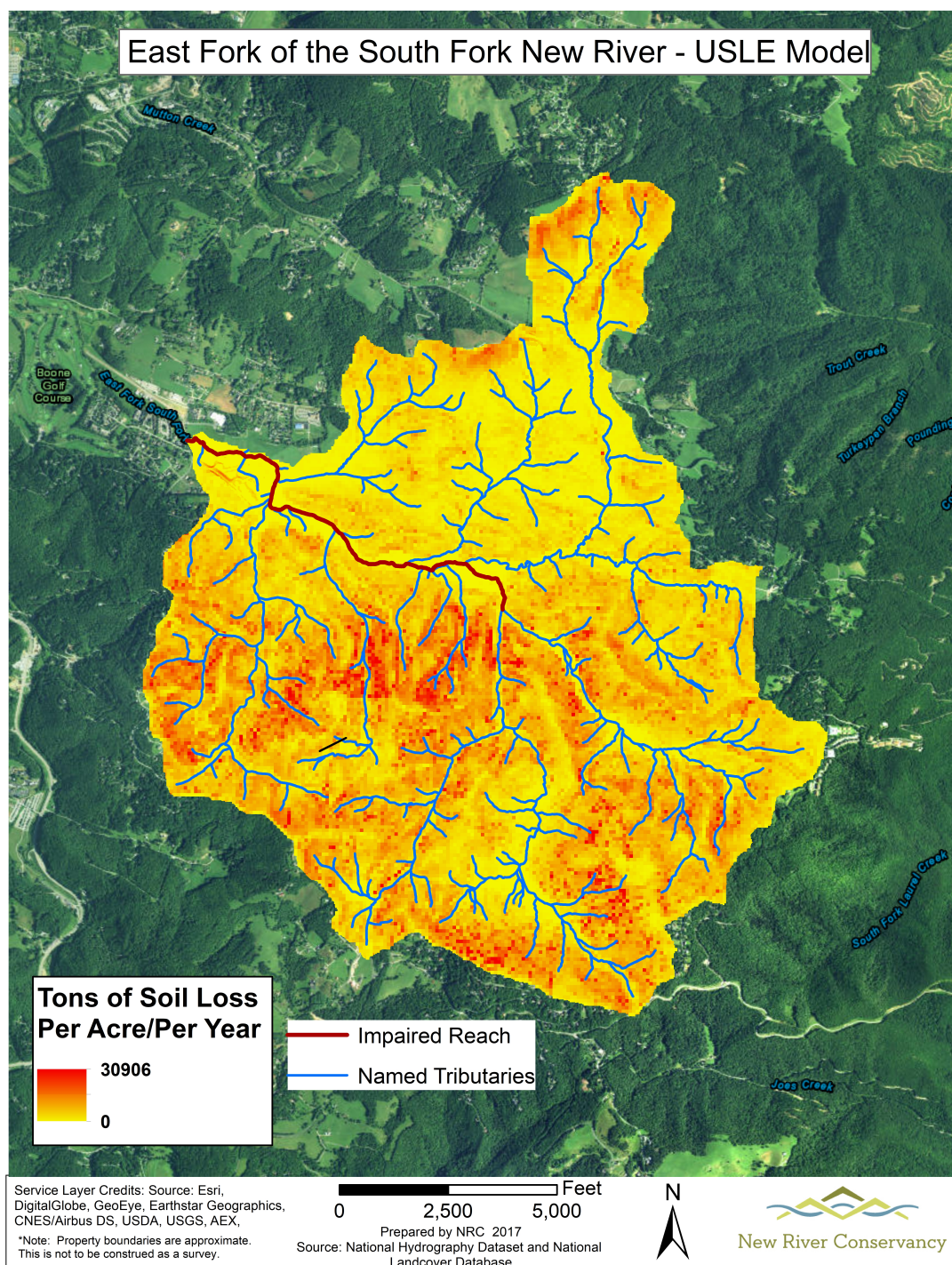


Figure 5: USLE model results for the East Fork Watershed

**Site 1: Unnamed tributary along western
Samaritan's Purse property boundary**

Right bank of the reach lacks riparian vegetation and is eroding. Left bank has a forested riparian buffer. A drain pipe placed perpendicularly to the direction of flow is causing further erosion on the right bank of the reach. Riparian vegetation planted along the right bank of the stream would decrease water temperature, bank erosion, and runoff into the stream.

Length of degraded reach: 225 ft

Issues: Bank erosion, lack of riparian buffer, poor pipe placement

Recommendations: Riparian buffer planting

Priority: High



Site 2: Unnamed tributary on Samaritan's Purse property

Low volume tributary to the East Fork running through mowed grass on the Samaritan's Purse property. The reach lacks riparian vegetation and is exposed to direct sunlight as well as lawn clippings. Shrubs would provide shade.

Length of degraded reach: 1000 ft

Issues: Lack of riparian buffer

Recommendations: Shrub planting

Priority: High



Site 3: East Fork along the north Samaritan's Purse property boundary

Both banks of the reach are incised. Some discontinuous riparian buffer with invasive species present. Piled dirt/mulch placed along the reach is contributing sediment to the river. Bank stabilization and planting of added riparian vegetation would reduce sediment contributions.

Length of degraded reach: 150 ft

Issues: Bank incision, discontinuous riparian buffer, invasive species presence, sediment runoff into river

Recommendations: Bank stabilization, invasive species removal/riparian buffer planting

Priority: High



Site 4: Wetland on the north bank of the East Fork on Bamboo Road

Site has been surveyed for development but appears to act as wetland. NRC has reached out to the town of Boone and is continuing to monitor the situation.

Length of degraded reach: N/A

Issues: Possible development on sensitive floodplain

Recommendations: Continued monitoring of the site

Priority: High



**Site 5: East Fork at intersection of
George Hayes Road and Bamboo Road**

Runoff from Bamboo Road is directly conveyed into the East Fork at the bridge above the river. Sediment traps and planted vegetation would greatly reduce the amount of runoff making it into the river.

Length of degraded reach: N/A

Issues: Road runoff conveyed into river

Recommendations: Plant vegetation and install sediment traps

Priority: Medium



Site 6: Raccoon Branch along Friendship Church Road

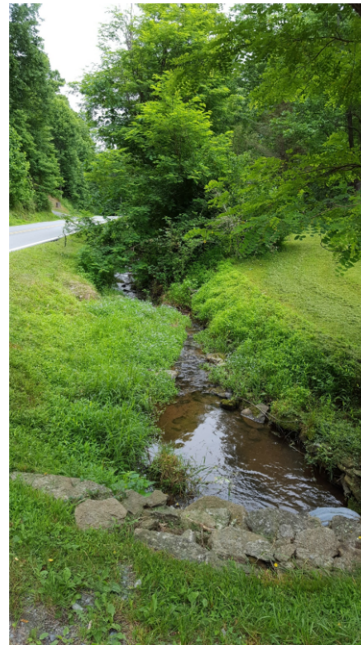
Site has high potential for soil loss according to USLE, but hardscaping was observed in the channel. Riparian buffer is discontinuous; some planting is needed. Continue to monitor the reach for changes

Length of degraded reach: 200 ft

Issues: Discontinuous riparian buffer

Recommendations: Riparian buffer planting, continued monitoring

Priority: Low



Site 7: Inline pond on Raccoon Branch

Large inline impoundment on Raccoon Branch lacks shade, elevating downstream water temperature. Grass surrounding pond is mowed up to the bank. Plant vegetation for shade and limit mowing to allow buffer to grow.

Degraded area: 2.6 acres

Issues: Lacks shade, mowed up to bank

Recommendations: Planting, limit mowing

Priority: Low



Site 8: Offline ponds along East Fork on Goshen Creek Lane

Flow from the East Fork is diverted to ornamental ponds, which may elevate downstream water temperature. Plant vegetation for shade and monitor water temperature.

Degraded area: 0.55 acres

Issues: Unshaded ponds

Recommendations: Plant vegetation, monitor water temperature

Priority: Low



**Site 9: Days Creek downstream of the intersection of
George Hayes Road and Gordon Day Road**

Small tributary at high risk of soil loss according to USLE. Reach is unshaded and located on pasture. The reach is located under power lines, limiting options for planting riparian vegetation. Riparian vegetation and cattle fencing would reduce potential soil loss.

Length of degraded reach: 630 ft

Issues: High risk of soil loss, lack of shade, cattle access

Recommendations: Plant riparian vegetation, fence out cattle

Priority: Low



Site 10: Days Creek at Winding Creek Lane

Site where NRC has previously planted riparian vegetation. Not all vegetation on right bank was successful and the riparian buffer is discontinuous. Additional planting is needed.

Length of degraded reach: 175 ft

Issues: Discontinuous riparian buffer

Recommendations: Plant riparian vegetation

Priority: Medium



Site 11: Unnamed tributary at Mount Vernon Baptist Church

Small tributary downstream of construction activity. Sediment control and cattle fencing failing, evidence of sedimentation in the streambed. Reach lacks riparian vegetation . Cattle fencing will need to be repaired, continue to monitor sediment BMPs during construction. Plant riparian vegetation to reduce water temperature and intercept runoff.

Length of degraded reach: 290 ft

Issues: BMPs failing, sedimentation, lack of shade.

Recommendations: Monitor sediment BMPs during construction, repair cattle fencing, plant riparian vegetation for shade.

Priority: Medium



Site 12: East Fork upstream of Samaritan's Purse property

Reach lacks riparian vegetation and is mowed to the banks, but no bank erosion occurring. No shade. Recommend planting native woody vegetation.

Length of degraded reach: 1750 ft

Issues: No riparian vegetation

Recommendations: Plant native woody vegetation

Priority: High



5 Recommended best management practices

The following BMPs are recommended for East Fork based on the observations and analysis within the 2011 New River Basinwide Water Quality Plan (NC Department of Environmental Quality-Division of Water Resources, 2011). Costs for BMP implementation are listed in Table 3.

Pollutant load reductions were determined using the EPA Region 5 model, a spreadsheet based modeling tool which provides estimates of sediment and nutrient load reductions for both agricultural and urban BMPs based on channel characteristics (Environmental Protection Agency, 2017). Annual sediment, nitrogen, and phosphorus load reductions associated with streambank restoration and riparian buffer enhancement were calculated for field assessment sites on streams based on BMPs recommended in Section 4 (Table 4).

Streambank enhancement and restoration

- Preserve streambank stability by planting riparian vegetation and protecting existing vegetation (Figure 6).
- In cases of severe bank erosion, the installation of engineered rock structures may be necessary to redirect flow away from streambanks.

Riparian buffer enhancement

- Riparian buffers should be widely implemented and existing buffers should be preserved. Vegetation is of crucial importance to the biological, chemical, and physical health of the stream as well as the bank's stability.
- Native riparian vegetation is recommended. Native species are adapted to the local ecology and have deep, fibrous root systems.
- Remove invasive species in riparian buffers to allow planted native vegetation to become established.

Stormwater management

- Install rain gardens, bioswales, and urban vegetation in order to slow stormwater and filter pollutants from runoff (Figure 7).

Livestock management

- Fence livestock out of the East Fork and its tributaries.
- Install livestock waterers as an alternative watering source.
- Farm no closer than 75-90 feet from the edges of streambanks and establish riparian buffers.
- Install rain gardens, bioswales, and urban vegetation in order to slow stormwater and filter pollutants from runoff (Figure 7).

Table 3: Estimated costs associated with BMP implementation

Management measure	Cost	Unit
Streambank restoration	\$150-250	per linear foot
Riparian buffer enhancement	\$10	per linear foot
Rain garden installation	\$5-25	per square foot

Table 4: Annual load reductions associated with implementation of streambank restoration and riparian buffer enhancement estimated by the EPA Region 5 model.

Site number	Sediment (ton/yr)	Phosphorus (lb/yr)	Nitrogen (lb/yr)
1	6.6	5.6	11.6
2	4.5	2.9	7.7
3	6.8	5.8	11.6
4	NA	NA	NA
5	NA	NA	NA
6	0.2	0.2	0.3
7	NA	NA	NA
8	NA	NA	NA
9	0.4	0.3	0.7
10	2.2	1.8	3.7
11	0.2	0.2	0.4
12	24.2	20.6	41



Figure 6: Example of past streambank enhancement planted by NRC



Figure 7: Designed urban streamwater capture located on the South Fork of the New River

6 Plan implementation

Implementing the recommendations of this plan will require coordination among the project team as well as involving local community members, landowners, and institutions. The envisioned steps are listed below:

1. NC Department of Environmental Quality approval of plan.
2. Focus on sites to implement BMPs. Establish chemical monitoring stations and begin monitoring water quality.
3. Work with landowners, contractors, the Town of Boone, Watauga County, the High Country Council of Governments, and community institutions to implement the BMPs outlined above.
4. Continue to monitor biological, physical, and chemical water quality parameters in the East Fork and its tributaries to assess the effectiveness of BMP implementation.
5. Apply the recommendations and results of this plan to other impaired waters in the New River Watershed.

6.1 Technical and financial assistance

This project is leveraging funds from several institutions. New River Conservancy will work with landowners, the High Country Council of Governments, Natural Resources Conservation Service, and Clean Water Management Trust Fund. Recommended BMPs will be designed and installed by engineering contractors. NRC continues to partner with contractors from Brushy Fork Environmental Consulting, Inc, Foggy Mountain Nursery and Stream Restoration, LLC, and Resource Institute, Inc, to design and install BMPs for restoration projects.

6.2 Prioritization

Prioritization will be given to sites based on the following criteria: Prioritization has been assigned to sites based on the following criteria. Site priorities are subject to change due to landowner willingness or funding availability for projects at a given site

- The extent of erosion and sedimentation.
- Public access or high visibility due to educational opportunities.
- Land use.
- Site's potential to improve water quality.
- Site's potential to remove the East Fork from the impaired waterbodies list.

6.3 Educational opportunities

The projects suggested provide excellent educational opportunities for the public. NRC is seeking volunteer water quality monitors to contribute to the NRW program in the East Fork. Volunteers contribute critical water quality data and serve as stewards of their local streams. NRC is also actively seeking student involvement. During past projects, NRC has partnered with high school and university students to perform benthic macroinvertebrate surveys at project sites. The surveys provide the project team with supplemental data and give students hands-on experience. Finally, NRC has offered internships to students to contribute to writing watershed plans and provide assistance in the field. In addition to learning more about water quality, interns are exposed to the nonprofit work environment and gain practical work experience. Interpretive material installed at project sites will demonstrate and display information on pollution and mitigation strategies.

6.4 Project phasing

To implement this project, we propose a 1-2-year timeline for sites deemed high priority. Projects commencing after the initial timeline will be implemented as funding becomes available. Steps for each project listed in section 4 are listed in the Appendix.

7 Conclusion

The East Fork Watershed has the opportunity to be a healthy ecosystem. However, the benthic community data collected by the NCDEQ suggest that the creek is unable to support the aquatic ecosystem as expected. Implementing the BMPs outlined in this plan will improve water quality, provide economic benefits, provide educational opportunities, and enhance ecosystem services. Without the implementation of BMPs, the stream will continue to degrade, consequently increasing future rehabilitation costs.

The success of this plan depends on the community's support. Landowners must be willing to implement the practices outlined. The project team has already begun the process of working with landowners and institutions in the watershed. Several projects are in the process of being proposed and funding is being sought. This project serves as an excellent opportunity for the community to learn about water quality. Encouraging citizens and community members in Boone and throughout Watauga County to become responsible local stewards who will inspire future generations and ensure the vitality and longevity of a healthy New River Watershed.

8 References

- Environmental Protection Agency. Welcome to the STEPL and Region 5 Model. (2017, December 06). <http://it.tetrattech-ffx.com/steplweb/>
- National Park Service. Most Visited Places of the National Park System. (2015). <https://www.nps.gov/aboutus/upload/Visitation-historic-and-top-10-sites-2015.pdf>
- North Carolina Department for Environmental Quality. New River Basinwide Water Quality Plan. (2011). <https://deq.nc.gov/about/divisions/water-resources/planning/basin-planning/water-resource-plans/new-2011>
- North Carolina Natural Heritage Program. <http://www.ncnhp.org/activities/conservation/natural-heritage-element-occurrences>
- State of North Carolina Tourism. Department of Commerce. <https://www.nccommerce.com/tourism/research/economic-impact/teim>
- Summary of the Clean Water Act. (2017, August 07). <https://www.epa.gov/laws-regulations>
- The Official Travel and Tourism Website for North Carolina. <https://www.visitnc.com/>

9 Appendix

Sites 1,2,3: Projects on Samaritan's Purse property

Steps	Task
1	Reach out to landowner.
2	Set meeting to discuss project and options with landowner and lawn maintenance staff.
3	Landowner signs 15-year agreement not to disturb project.
4	Plant riparian zones during next immediate planting season (Oct-Mar).
5	Monitor plantings the following spring.
6	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.

Site 4: Wetland on the north bank of the East Fork on Bamboo Road

Steps	Task
1	Identify and reach out to landowner.
2	Contact Town/County to search for any existing building permits.
3	Continue to check with Town/County for any submitted building permits.
4	If permits are filed, work with landowner/builder to recommend stormwater BMPs.

Site 5: East Fork at intersection of George Hayes Road and Bamboo Road

Steps	Task
1	Conduct water quality monitoring to identify contaminants.
2	If threat is related to surface runoff from road, reach out to County DOT.
3	Set meeting with DOT to discuss options for this site
4	Work with DOT to bring funding to project and ensure progress until completion.
5	Continue water quality monitoring.

Site 6: Raccoon Branch along Friendship Church Road

Steps	Task
1	Identify and reach out to landowner.
2	Delineate DOT right-of-way along Friendship Church Road. Determine if riparian buffer falls within DOT right-of-way.
3	If buffer is within the right-of-way, reach out to county DOT.
4	Set meeting to discuss project options with landowner and DOT.
5	Plant riparian buffer during next immediate planting season (Oct-Mar).
6	Monitor plantings the following spring.
7	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.

Site 7: Inline pond at Raccoon Branch

Steps	Task
1	Identify and reach out to landowner.
2	Set meeting to discuss project options with landowner.
3	Landowner signs 15-year agreement not to disturb project.
4	Plant riparian zones during next immediate planting season (Oct-Mar).
5	Monitor plantings the following spring.
6	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.

Site 8: Offline ponds along East Fork on Goshen Creek Lane

Steps	Task
1	Identify and reach out to landowner.
2	Set meeting to discuss project options with landowner.
3	Landowner signs 15-year agreement not to disturb project.
4	Plant riparian zones during next immediate planting season (Oct-Mar).
5	Monitor plantings the following spring.
6	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.

Site 9: Days Creek downstream of the intersection of George Hayes Road and Gordon Day Road

Steps	Task
1	Identify and reach out to landowner. Reach out to NRCS for options regarding cattle exclusion.
2	Set meeting to discuss project options with landowner and NRCS.
3	Landowner signs 15-year agreement not to disturb project and cattle exclusion documents provided by NRCS
4	Exclude cattle from stream and install cattle drinkers in field (NRCS).
5	Plant riparian zones during next immediate planting season (Oct-Mar).
6	Monitor plantings the following spring.
7	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.

Site 10: Days Creek at Winding Creek Lane

Steps	Task
1	Reach out to HOA/POA.
2	Set meeting to discuss further planting under River Builder Program.
3	Landowner/HOA/POA signs 15-year agreement not to disturb project.
4	Plant riparian zones during next immediate planting season (Oct-Mar).
5	Monitor plantings the following spring.
6	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.

Site 11: Unnamed tributary at Mount Vernon Baptist Church

Steps	Task
1	Reach out to landowners/contractor.
2	Set meeting to discuss project options/sediment BMPs with landowners/contractor.
3	Recommend repair to cattle fencing, better silt fences/sediment traps, and riparian planting.
4	Landowner signs 15-year agreement not to disturb project.
5	Plant riparian zones during next immediate planting season (Oct-Mar).
6	Monitor sediment BMPs and riparian planting.

Site 12: East Fork upstream of Samaritans Purse property

Steps	Task
1	Identify and reach out to landowners.
2	Set meeting to discuss project options with landowners.
3	Landowners sign 15-year agreement not to disturb project.
4	Plant riparian zones during next immediate planting season (Oct-Mar).
5	Monitor plantings the following spring.
6	Final monitoring second following spring. Determine if more plants are needed to complete the enhancement of the streambank.