

\* NRCS OFFICE

# Conceptual Restoration Plan

## Charles-McGinnis Site South Fork Big Pine Creek

by  
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and  
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## **Introduction**

The purpose of this plan is to document for you, the landowner, those practices that we propose employing to restore or enhance the habitat value of the stream and its riparian zone on your property. This plan gives you the opportunity to evaluate the scope of work that is being proposed and to provide a basis for discussion regarding the acceptability of the practices. Since we have been discussing these ideas with you from the beginning, we hope this plan will serve to put in black and white the general concepts to which you already agreed. If, however, something in this plan is new or unacceptable, we want to discuss it and work out any problems that you may have.

Once you are satisfied with the basic ideas in this plan, the conservation easement agreement will need to be written. The Department of Transportation (DOT), Right-of-Way personnel, will be working with the North Carolina Wildlife Resources Commission (WRC) to develop these agreements; however, the agreement will be between the landowner and the WRC. The WRC will hold the easement. A DOT crew will survey the easement boundary for a legal easement description. Once the conservation easement document is written we will sit down with you to review the document. This is the point at which the landowner must decide to continue with the mitigation program or not. Once the easement is signed we will develop more in depth work plans and schedule a time when the work can begin. In general, nothing will be contained in the work plans that has not been described in this plan. If something new comes up, it will be discussed with the landowner and only included in the workplan if the landowner agrees in writing to the new practice.

## **Objective**

The overall objective of this work is to improve the habitat value of streams within Madison County. This is being funded by DOT to mitigate the general public for streams that were placed in culverts while building I-26. The biological value of these streams was lost to the public. By biological value we mean their ability to support trout and other fish populations, to support angling for these fish, to provide cover for wildlife and the many other benefits that streams provide to the public. Since we cannot replace the lost streams, we are trying to compensate the public by restoring or enhancing the biological value of streams in the county that have been degraded by various causes.

We are hoping to improve the habitat value of these streams by reducing erosion, altering the shape of the stream so that it is more stable, and improving fish habitat. We are also concerned with the riparian zone. That is the narrow strip of land on the sides of the stream. The width of this zone depends on the size of the stream. The riparian zone is important to trout streams because it provides the vegetation that shades the stream and keeps the water cold. This is very important in Madison County since many streams are at a relatively low elevation and, without shade, will warm to a point where they may not support trout. This vegetation is also vital to the stability of the banks. The root mass of

the riparian vegetation holds the soil together even under high flows. These areas provide resting, travel and feeding habitat for many species of wildlife. We are addressing improvements to streams by proposing enhancement measures for both the stream channel and the riparian zone.

Specific objectives for the Charles-McGinnis site are described in detail in the recommendations section below and are the following:

1. Remove the stone and soil berm that line the top of the west creek bank.
2. Where possible, widen the floodplain of the creek.
3. Slope and vegetate the west creek bank so that it is more resistant to flooding.
4. Plant native trees, bushes and ground cover that will stabilize the creek banks, shade the stream, and provide wildlife cover and food.
5. Place fish habitat improvement structures along the upper reach of the site.
6. Construct a fence along the easement boundary on the west creek bank, around the wetland/tributary in the lower field and along a tributary to the stream in the pasture above the barn and install a livestock crossing of this small tributary.
7. Install 3 livestock watering tanks, so that the livestock will no longer need to water from the creek.

### **Recommendations**

#### **Conservation Easement:**

A condition of participating in this mitigation program is that the landowner agrees to place his stream riparian zone in a conservation easement. When you get this plan, we will have already talked about the easement line, and a proposed easement boundary should be marked on your property. Please walk this line and determine if the marked line will be satisfactory. If there are problems we can review the proposal and determine if the line can be altered. We have marked the line based on the size of the stream, the predicted frequency of flooding, and the amount of land needed to provide a significant vegetative cover of the stream. Before we move to the next stage, which is developing the easement document, we need to be fairly firm on where the line will be because this line will be surveyed and the survey description used in the document. Fence installation will follow this boundary line and right-of-access to the easement by WRC personnel will be stated in the agreement. The easement will be held by the WRC and the agreement will be between the landowner and the WRC. If you have specific concerns that you would like addressed in the easement agreement, please make note of them so that we can insure they are included in the agreement.

### Channel Improvements:

The stream reach at this site is a B type channel. This channel is moderately entrenched with an unusually low width/depth ratio and sinuosity. These characteristics are probably remnants of past channelization. The primary component of the stream bed is cobble; however, the stream banks are composed of soil. This also suggests that the stream was turned into the present channel at some time in the past. According to the NRCS, flood damage along this creek was addressed by channelization in the early 1980's. We suspect that this channel is in the process of evolving from a G channel type to a B. We are calling it a B based on the moderate entrenchment and slope.

At spots along the channel the stream has developed a narrow floodplain. This will benefit the stream by slowing water velocity during a high water event. This in turn will reduce the amount of erosion occurring on the stream banks. We plan to construct a floodplain bench along the creek to enhance what the stream is attempting to do naturally. This will not involve filling the existing creek, but rather moving the slope of the stream bank back away from the water for approximately 5 feet. Above this floodplain the stream bank will be sloped to the top of the bank and vegetated (see the cross-section drawings in the appendix).

Trout habitat in the form of pools is rare in the upper reach of this site. We plan to add some plunge pools at intervals along this upper reach above the bridge. Structures will be added at the normal pool to pool spacing for B type streams of 3-4 bankfull widths. Structures will be made out of logs or boulders and placed below bankfull so that high flows will not be diverted into the bank, causing erosion.

### Riparian Improvements:

The riparian zone at this site can be divided into a fair upstream reach and a good reach downstream of the bridge. The west bank of the stream has a 1 to 2 foot high berm along the upper reach of the stream. This berm was probably deposited when the stream was channelized, and then enlarged by landowners removing rock from the adjoining field. The upstream reach has very little woody vegetation; however, it does have a thick stand of reed canary grass. This nonnative grass was most likely planted by the NRCS when the stream was channelized in the 1980's. It prefers wet ground and does well as a stream stabilizing material on stream banks with low to moderate slopes. It does not provide the shade that the stream needs to maintain the cold water trout require. It also does not root deeply enough to protect the bank under extreme water velocities. There are a number of sites along this upper reach where erosion is taking place. These sites have no floodplain and the banks are vertical for 1 to 3 feet.

There are trees along most of the lower reach and, except for a few spots, the banks are stable. Most of the problem spots are the result of livestock accessing the stream to get water. The biggest problem along the lower reach is the narrow width of the riparian zone. In most places riparian vegetation is one tree wide. The east creek bank has SR 1158 running along it for the length of the site. The width of the riparian zone varies from

a few feet to about 30 feet. Except for DOT mowing the east bank is maintained in a natural state.

We propose to improve the riparian zone at this site with a number of practices. Primary among these are livestock management practices that will be discussed in the next section. We propose to remove the berm along the west creek bank and cut it down to the elevation of the adjoining field. This will allow woody vegetation to root in soil that is now covered with rock. This will also allow extreme flood waters to move out onto the banks and reduce the damage to downstream property. After the berm is removed the stream banks will be sloped to approximately a 2:1 slope. This will allow the water to move up the sloped surface rather than eroding a vertical bank. After the creek bank has been sloped it will be vegetated with native grass. The reed canary grass will most probably return. We will also plant low growing woody species such as alder, willow, red twig dogwood and button bush. On the upper banks we will plant taller growing trees that provide shade, stable creek banks and wildlife cover and food. The species of trees used on the upper bank is open to the desires of the landowner. Any suggestions will be taken into consideration and utilized if possible. We propose that on the east bank the land between the road and the creek be included in the easement.

#### Livestock Exclusion:

An important part of our stream mitigation plan is the exclusion of livestock from the riparian buffer of the stream. In large part, livestock management will determine the success of the other practices. The Natural Resource Conservation Service (NRCS) has developed these livestock exclusion proposals. The estimated total cost of the practices proposed for installation on your property is \$9862.50. The attached Conservation Plan details the planned treatments and the costs by treatment (see appendix). Note that this plan is commonly used by the NRCS to develop cost-shared, conservation plans and shows 75% of the actual costs, which they commonly pay. In this program we are paying 100% and this total has been written on the plan. The installation of these livestock treatments can be done by the landowner or a designated contractor. The NRCS will administer all phases of this part of the mitigation plan.

Fencing: We propose to fence the entire west bank of the stream at this site. Since the area between the road and the stream on the east bank is relatively narrow we do not feel that a fence is needed on this bank; however, we would like for this area to be placed in the easement. In addition fencing should be placed around the small tributary coming out of the wetland area in the lower pasture. We also propose to fence the small tributary that begins under the powerline in the upper pasture and flows down just above the barn. This fence would run from the origin of the tributary to an existing fence above the barn. This tributary is small but appears to be contributing a great deal of sediment to the main channel. A cattle crossing will also be constructed on this tributary so that cattle can move across the buffer area. A map of the site, showing the proposed location of the fence, is attached in the appendix. The fence will be built to the standards of NRCS. Normally, the fence will be a 4 strand barbed wire fence mounted on metal posts and

pressure treated, wooden turn posts. If the landowner would prefer a different type of fence, he should contact the NRCS office to discuss other acceptable types of fencing.

Watering facilities: Since the stream will no longer be available to the livestock as a source of water, we will install 3 watering tanks. This installation will include developing 3 springs as a water source, installing pipe to move the water from the springs to the tanks and hardening the areas around the tanks. Tanks are made of concrete and have a rectangular shape. They have 6 to 8 openings in the top so that several animals can drink at one time (see the picture in the appendix). The locations of these tanks, springs and pipes are shown on the attached map (see appendix). If the landowner has any concerns regarding the proposed livestock exclusion proposal, he should contact the NRCS to discuss other options.

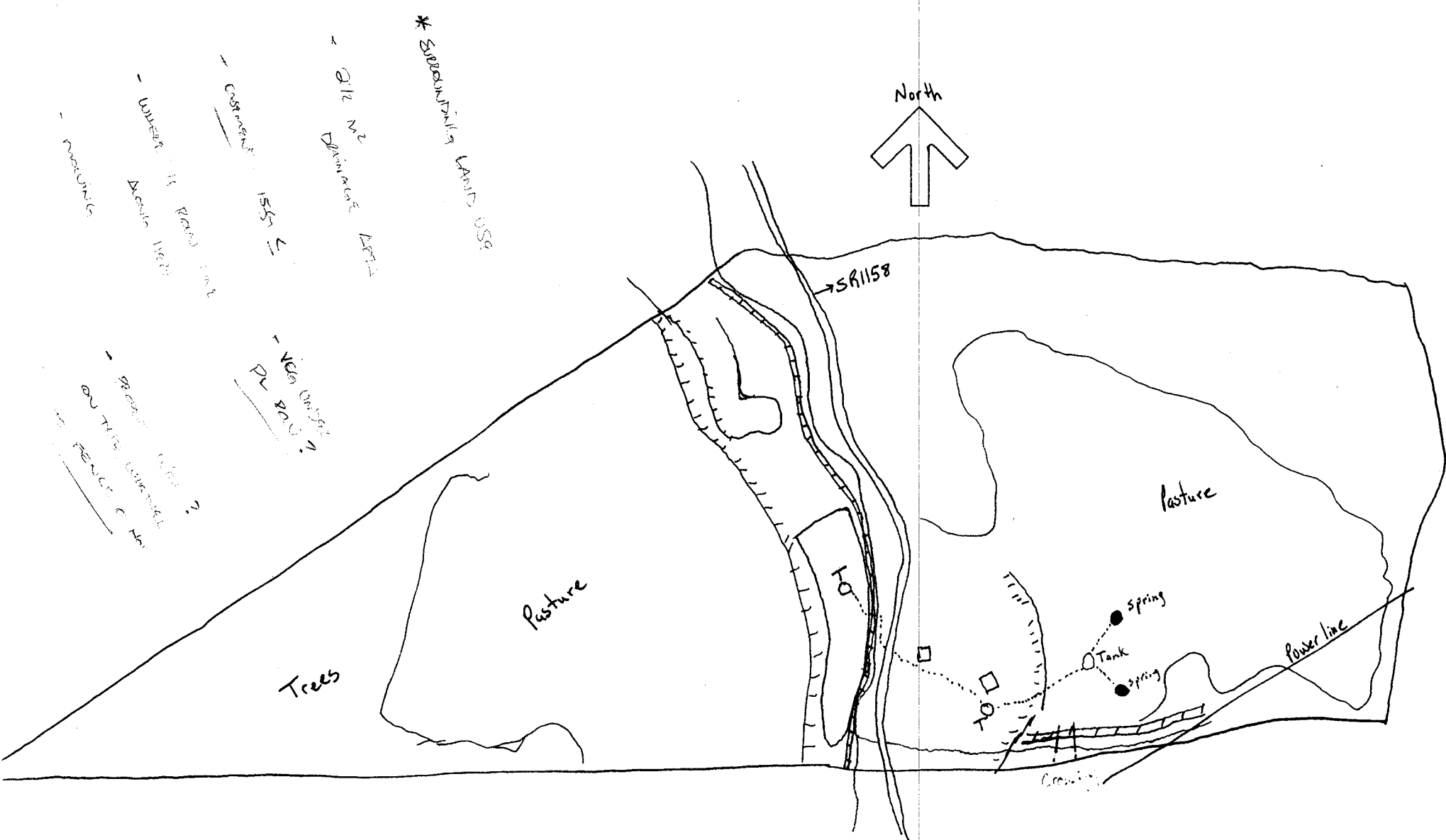
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# Appendix

## Contents:

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1. Map of site showing fence placement, springs to be developed, routing of pipe and tank sites. Easement area would be from fence line on South Fork Big Pine Creek over to SR 1158.
2. Natural Resource Conservation Service conservation plan for the site. Note most costs are shown at 75% as is common for their plans. This program pays 100% of project costs and the total estimated cost has been written in on page 2.
3. Cross sections of South Fork Big Pine Creek taken at the project site, showing in red the proposed sloping and floodplain construction.
4. Pictures of the livestock watering tanks that are proposed for this site.



Charles-McGinnis Site  
 South Fork Big Pine Creek

- ▨▨▨ Fence
- ..... Water Line
- Tank
- Spring



CONSERVATION PLAN

Client: Charles, Thomas

Thomas Charles

Assisted By: rcb

LAND UNITS		PLANNED			APPLIED		PLANNED CONSERVATION TREATMENT
TRACT	FIELD	AMOUNT	MONTH	YEAR	AMOUNT	DATE	
							pastureland
3609	1, 3	12.6Ac					
3609	1	1075.0ft	08	1998			FENCE
	3	300.0ft	08	1998			Fencing will be installed at locations shown on the plan map. Review standards and specifications on the attached job sheet for information. See Job Sheet i.
3609	3	0.2ac	08	1998			HEAVY USE AREA PROTECTION A heavy use area will be installed as shown on the attached plan map. Follow attached plans and specifications.
3609	1	700.0ft	08	1998			PIPELINE
	3	700.0ft	08	1998			Pipeline will be installed from spring supply sources to watering facilities as shown on the attached plan map. Pipe and pipe installation must meet NRCS standards and specifications.
3609	3	3.0no	08	1998			SPRING DEVELOPMENT Springs will be developed as a source of water for livestock. Springs will be developed according to plans and specifications as shown on the plan map or developed in the field.
3609	3	1.0No	08	1998			Stream Crossings Install livestock stream crossing as shown on plan map. Follow attached engineering standards and specifications.
3609	1	1.0no	08	1998			TROUGH OR TANK
	3	2.0no	08	1998			Install trough or tanks as located on the plan map. Troughs or tanks will be installed to provide adequate water supply for livestock and located to provide maximum water quality benefits. Troughs and tanks must meet SCS standards.
3609	1	3.6ac	08	1998			USE EXCLUSION
	3	6.1ac	08	1998			Livestock will be excluded from stream branches and other water sources using appropriate fencing standards.

CCC-1201E

charth

EQIP 3799 APPLICATION EVALUATION WORKSHEET  
 Single System Report

Thomas Charles  
 302 South Library Street  
 Greenville, NC 27858

I. Land Use	System Name			Total Acres
Pasture	NC Ag Cost Share Plan			12.6 Acres
Farm	Tract	Field		
thomch	3609	1, 3, 2		

II. Resource Concerns and Criteria	Units	Max	Impact	Points
SOIL EROSION, Sheet & Rill, RUSLE	Tons/Ac/Yr	50	10.0	50
SOIL EROSION, Streambank, acres affected	Acres	40	0.300	13
WATER QUALITY, Groundwater Contam, nitrate leaving root zone	Lb/Ac/Year	27	10	10
WATER QUALITY, Surface Water Contam, nitrate-N leaving field	Lb/Ac/Yr	28	10	10
WATER QUALITY, Other, annual nitrogen applied	Lb./Ac./Yr	35	25	25
Total Evaluation Points:				108

III. Conservation Practice	Units	Amount	Unit /Cost	CS Rate	Prog Cost
FENCE	ft.	1375.0	\$ 1.50	75%	\$1546.88
USE EXCLUSION	ac.	9.7	\$ 0.00	75%	\$ 0.00
HEAVY USE AREA PROTECTION	ac.	0.1	\$20000.00	75%	\$1500.00
SPRING DEVELOPMENT	no.	3.0	\$400.00	75%	\$900.00
Stream Crossings	No.	1.0	\$1000.00	75%	\$750.00
TROUGH OR TANK	no.	3.0	\$1200.00	75%	\$2700.00
Total Costs					\$7396.88

100% Total Cost = 9862.50

IV. Applicants Score or Index	Index
Total Cost/Points	
69	

V. Other Concerns

1+00

Charles Side  
Cross Sections

1+50

2+00

Photo 1

2+50

Proposed Flood Plain

4+00

