Conceptual Restoration Plan

Brigman Site
Paint Fork Creek

by
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and
Russell Blevins, NRCS

August 3, 1998

Introduction

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

Once the landowner is satisfied with the basic ideas in this plan the conservation easement agreement will need to be written. The Department of Transportation , Right-of-Way personnel will be working with the NCWRC to develop these agreements. They will have a survey crew survey the easement boundary as described in this document and then we will sit down with the landowner 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 included in the workplan only 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 NCDOT to mitigate the general public's loss of streams that were placed in culverts to build I-26. The biological value of these streams was lost to the public. By biological value we mean there 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 can not 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 for various reasons.

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 by 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 shade that 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 were they no longer support trout. These areas also provide resting and travel cover 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 Brigman site are described in detail in the recommendations section below and are the following:

1. Where possible widen the floodplain of the creek. Widening would be done within the easement area.

2. Slope and vegetate vertical creek banks so they are more resistant to flooding.

3. Rootwads and rockveins will be used as needed to stabilize eroding sites along the stream bank and to improve fish habitat.

4. Plant native trees, bushes and ground cover that will stabilize the creek banks, shade the stream, and provide wildlife cover and food.

5. Construct 7000 feet of fence along the easement boundary on Paint Fork Creek, along an unnamed tributary that joins Paint Fork Creek in the middle of this reach and just below the landowners house, and along a second tributary that follows the western boundary of the property and enters Paint Fork just off of this property .

6. Install 7 livestock watering tanks, so livestock will no longer need to water from the creek. Installation includes spring development, piping of water, tank site development and placement.

7. Construction of 3 stream crossings of the tributaries. These crossings will allow cattle full access to the pasture after access to the creek and riparian area is stopped by fencing. A fouth crossing may be put in on the western tributary or as an alternative a cattle guard will be placed in the road.

8. Stabilize the extreme bend in front of the landowners house but constructing a rootwad revetment. This will involve removing existing junk cars and constructing the revetment with rootwads and boulders.

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. We are aware of two locations that will need to have a special delineation for this easement. The area on the inside of the big bend in the river is presently used as an equipment storage area. We can make the easement line around this bend a minimal distance of 10 feet off of the water, so that the historical use of this area can continue. Since livestock are not allowed on this area it will not need a fence. The second area needing a special delineation is around the dog pen along the middle tributary. In this case the easement and fence will be continuous with the back fence of the dog pen. The WRC will retain the right to run the same type fence as will be constructed elsewhere, along the dog pen if the need arises in the future.

Channel Improvements:

Determining stream type at this site is complicated by past stream relocation and channelization. Due to past activities in the riparian zone the channel varies from entrenched to moderate entrenchment to slight entrenchment at various sites. The site has a moderate width/depth ratio that would indicate a B, C or F type channel. The valley slope over 2 -3 miles in this area is .007 which indicates a C type channel. However, the slope along the reach at this site is steeper at .014, this would further indicate a B stream type. Bedrock at this site has resisted the erosive force of the stream resulting in a steeper stream slope over the reach.

At spots along the channel the stream has developed a narrow floodplain. This floodplain is below bankfull but should still benefit the stream by slowing water velocity during high water events. This in turn will reduce the amount of erosion occurring on the stream banks. At several locations along this reach the south bank is vertical and is eroding despite the presence of extensive non-woody vegetation. We propose to construct a floodplain bench at the bankful elevation, 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 at this site. What pool habitat that does exist is associated with bends and bedrock outcropping. We plan to add some plunge pools at intervals along this site. 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. Rootwads will be placed in the bank where the creek is meandering and presently causing erosion. These structures will stabilize the bank and provide cover for

trout. Bedrock is evident at a number of locations in this reach. Utilization of in-stream habitat improvement structures will be dependent on how much the bedrock limits our ability to anchor these structures.

The middle tributary, just below the house, is a B type stream with pools and riffles. Most of the stream channel problems are associated with past channelization and an old impoundment. The stream is downcutting the silt accumulated at the old pond site and this is causing the banks to fall in. We propose widening the floodplain, sloping the creek bank and vegetating the bank with woody vegetation at this site. The lower tributary will have a floodplain developed within the easement area. This should decrease the damage done by high water.

Riparian Improvements:

The riparian zone at this site is in fair to good shape. It has extensive non-woody vegetation and trees of various sizes scattered along the reach. Most of Paint Fork Creek at this site borders fields were tobacco is raised in the summer and cattle may be pastured in the winter. Livestock pasture borders this creek at a couple of locations for short lengths of the total reach. The middle and lower tributaries are bordered by livestock pasture. Livestock have had access to these two tributaries for a long time. The riparian zone of both tribs has suffered from degradation of the stream banks by livestock trampling them. Stream side vegetation has been altered by grazing and now primarily consists of grasses and some alders on the lower tributary. The primary threat to the existing riparian zone of Paint Fork Creek is erosion at spots along the stream bank and the lack of woody vegetation on the south bank. Threats to the riparian zone of the tributaries are trampled banks and the lack of woody vegetation to hold the banks during flooding.

We propose to improve the riparian zone at this site with a number of practices. Where stream banks are vertical the banks will be sloped to approximately a 2:1 slope. A floodplain area will be built into these banks. This will be done within the marked easement area. These practices will allow the water to move up the sloped surface rather than eroding a vertical bank. After the creek bank has been shaped it will be vegetated with native grass and 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.

Livestock Exclusion:

An important part of our stream mitigation plan is the exclusion of livestock from the riparian buffer of Paint Fork Creek and the two tributaries. 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 livestock practices proposed for installation on your property should be approximately $25,813.00. 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% of costs and this estimated 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 most of the south bank of the stream along the marked easement line at this site. This will include fencing the easement along the upper and lower fields. The area in front of the house may be left without a fence; however, the WRC retains the right to fence this area in the future if land use adjoining the riparian buffer imperils its integrate. Since this site is directly below the home it may be mowed. Fencing of both sides of the two tributaries is proposed. The middle tributary will have a fence on the east bank that runs at the top of the creek bank. This line has been placed at a minimal set back for most of its length. However, the west bank of this tributary is a steep slope and on this bank the line has been set at the top of the slope which is 20 to 50 feet from the stream. An existing dog pen is located on the west bank of this stream, at the top of the stream bank. The back fence of this pen will serve as the easement line at this location. The lower tributary will be fenced along both sides of the stream. A map of the site, showing the proposed location of the fence, is attached in the appendix. Approximately 7000 feet of fence has been proposed for installation at this site. The fence will be built to the standards of the NRCS. Normally, the fence will be a 4 strand barbed wire fence mounted on metal posts and pressure treated, wooden turn posts. Gates can be added to the fence at the request of the landowner and at locations desired by them. If the landowner would prefer a different type of fence, he should contact the NRCS office to discuss other acceptable types of fencing.

Cattle Crossings: Three cattle crossings of the tributaries are proposed. These crossings will allow the cattle to access the pasture as they do now without allowing them to go into the creek or riparian zone. Two culverted crossings will be constructed at the upper end of each tributary and a second crossing will be located at the lower end of the middle tributary. A second crossing at the lower end of the of the western tributary is included in the NRCS plan; however, rather than doing this we might install a cattle guard on the road and use the existing fence line above the road at this location. We will need to decide how best to complete the fencing in this area. Fencing has been marked in the field and was based on our discussions.

Watering facilities: Six new watering tanks and the relocation of an existing tank are proposed for this site. Tanks are made of concrete and have a rectangular or round shape, depending on the size of the tank. The round tanks have an open top, while the rectangular tanks have a number of openings (see the picture in the appendix). The size of the tank used at this site will be based on your needs. Existing springs on each tributary will be headed up and fed through pipe to these tanks. Tank locations will be hardened for high use and overflow returned to the tributaries. Three tanks will be

Appendix

Contents:

1. Map of site showing proposed fence, tank and crossing locations.

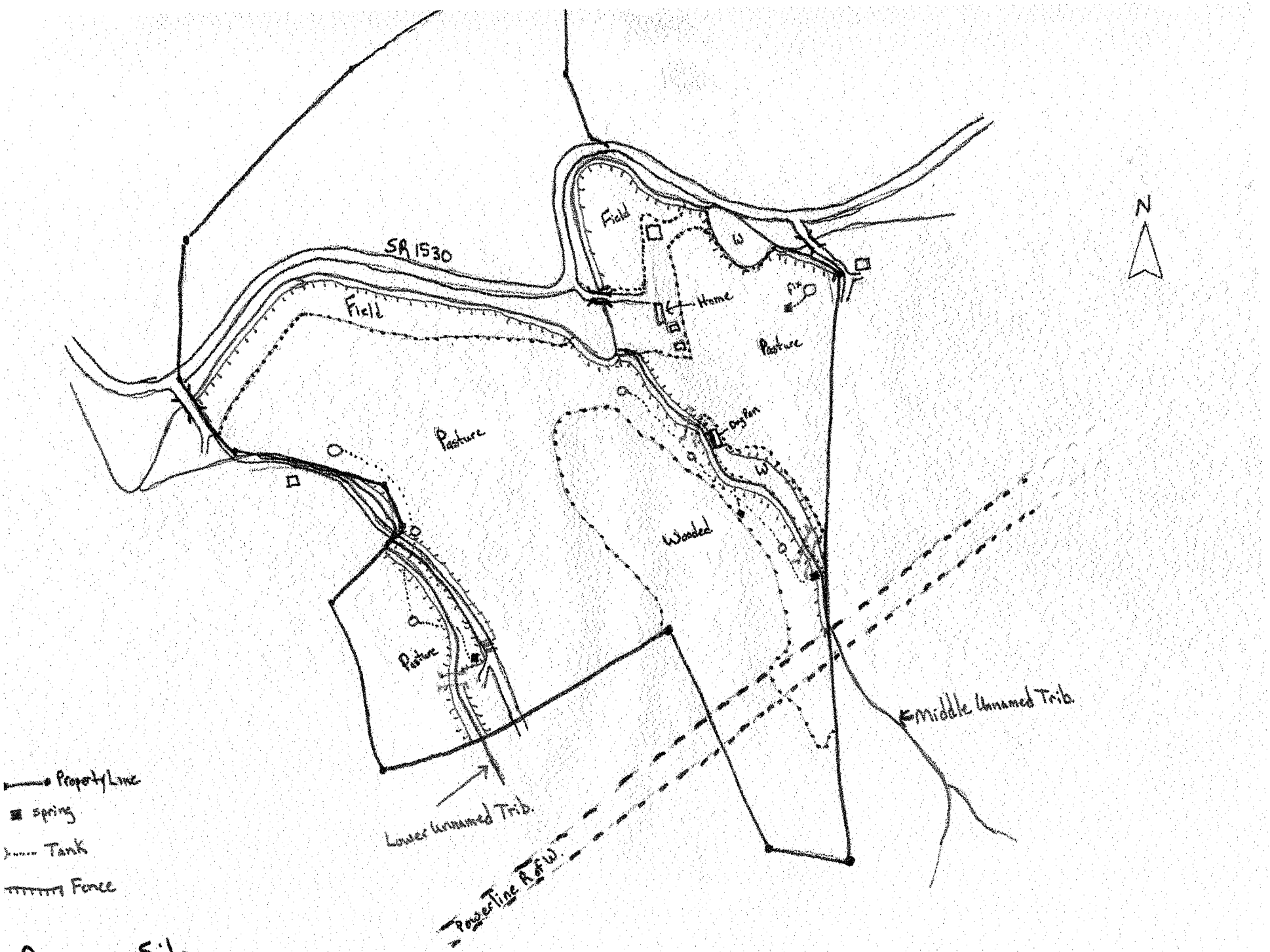
2. Natural Resource Conservation Service conservation plan for the site. Note most costs are shown at 75% as is common for their plans. This program pays 100% of project costs and the total estimated cost has been written in on page 2 of this plan.

3. Cross sections of Paint Fork Creek taken at three sites along the the project reach, showing the proposed sloping and floodplain construction as a dotted line.

4. Pictures of livestock watering tanks that can be used at this site.

5. Pictures of rootwads that have been used for bank stabilization. A method that may be used at this site.

6. Pictures of the rock veins used to divert water off of an eroding bank. A method that may be used at this site.



Brigman Site

I.S. DEPARTMENT OF AGRICULTURE
IATURAL RESOURCES CONSERVATION SERVICE
larshall (Madison) Field Office (704)649-3313

CONSERVATION PLAN

Client: Brigman, Oscar Oscar Brigman
Assisted By: Russell Blevins

LAND UNITS		PLANNED			
TRACT	FIELD	AMOUNT	MONTH	YEAR	PLANNED CONSERVATION TREATMENT
					pastureland
225	3, 4, 1, 2	28.9Ac			
226	1, 2, 3	10.7Ac			
225	3 HEL*	300.0ft	06	1998	ANIMAL TRAILS AND WALKWAYS
	4 HEL*	100.0ft	06	1998	Install stock trails/walkways according to plan and specifications on the plan map.
225	1 HEL*	1100.0ft	06	1998	FENCE
	2 HEL*	400.0ft	06	1998	Fencing will be installed at locations shown on the plan map. Review standards and
	3 HEL*	2400.0ft	06	1998	specifications on the attached job sheet for information.
226	1	500.0ft	06	1998	
	2	900.0ft	06	1998	
225	1 HEL*	200.0ft	06	1998	PIPELINE
	2 HEL*	1200.0ft	06	1998	Pipeline will be installed from spring supply sources to watering facilities as
	4 HEL*	800.0ft	06	1998	shown on the attached plan map. Pipe and pipe installation must meet NRCS standards and specifications.
	1 HEL*	1.0no	06	1998	SPRING DEVELOPMENT
	2 HEL*	3.0no	06	1998	Springs will be developed as a source of water for livestock. Springs will be
	4 HEL*	3.0no	06	1998	devloped according to plans and specifications as shown on the plan map or developed in the field.
225	2 HEL*	2.0No	06	1998	Stream Crossings
	3 HEL*	1.0No	06	1998	Install livestock stream crossing as shown on plan map. Follow attached engineering
	4 HEL*	1.0No	06	1998	standards and specifications.
225	1 HEL*	1.0no	06	1998	TROUGH OR TANK
	2 HEL*	3.0no	06	1998	Install trough or tanks as located on the plan map. Troughs or tanks will be
	3 HEL*	1.0no	06	1998	installed to provide adequate water supply for livestock and located to provide
	4 HEL*	2.0no	06	1998	maximum water quality benefits. Troughs and tanks must meet SCS standards.
226	3	1.0no	06	1998	
225	1 HEL*	8.9ac	06	1998	USE EXCLUSION
	2 HEL*	7.3ac	06	1998	Livestock will be excluded from stream branches and other water sources using
	3 HEL*	8.8ac	06	1998	appropriate fencing standards.
	4 HEL*	3.9ac	06	1998	
226	1	1.0ac	06	1998	

IL Fields marked as HEL are highly erodible fields. All practices planned and installed are for the reduction of erosion and will meet the Standards and Specifications contained in the USDA-SCS Field Office Technical Guide.

IL* Idle land with at leat 50% ground cover maintained on the surface continuously may be substituted for a row crop in the Conservation Cropping Sequence management Practice and, if applicable, the planned and associated supporting management practices- Conservation Tillage and Crop Residue Use for the same time period and field.

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
Marshall (Madison) Field Office (704) 649-3313

(INTERIM) NRCS-LTP-11-E | PAGE
1-97 | 1 OF 3

CONTRACT SUPPORT DOCUMENT

NO.: TOTAL ACRES: 39.6

Oscar Brigman	Madison County	NC

ITEM NO	FIELD	PLANNED CONSERVATION TREATMENT	EST. AMOUNT (UNITS)	COST / UNIT	COST SHARE %	ESTIMATED COST-SHARE BY YEAR 1998	1999	2000	2001	2002	2003
1	1, 2, 3	Tract 1225									
	1, 2	Tract 1226									
		FENCE (382)									
		Barbed, woven, or high tensile	7000.0 Lft	$ 1.50	75.0	$ 7,875					
		(4 strands) fence									
2	1, 2, 4	Tract 1225	2200.0	NC	NC	2200.0					
		PIPELINE (516)	ft.			ft.					
3	1, 2, 4	Tract 1225									
		SPRING DEVELOPMENT (574)									
		EXCAVATION-spring development	28.0 Hr	$ 50.00	75.0AA	$ 1,050					
4	3, 4	Tract 1225									
		ANIMAL TRAILS AND WALKWAYS									
		(575)									
4a		FILTER CLOTH-geotextile fabric	267.0 SqYd	$ 2.00	75.0AA	$ 401					
		PIPE-CPP non-perforated 18"	120.0 LinFt	$ 9.75	75.0AA	$ 878					
4c		STOCK TRAIL-new,	160.0	$ 1.50	75.0AA	$ 180					
		excavate/grade	LinFt								
4d			20.0	$ 12.00	75.0AA	$ 180					
		STONE-gravel	Ton								
4e			4.0	$ 10.00	75.0AA	$ 30					
		VEG-fert, 10-10-10, cwt	Cwt								
4f			0.1	$ 50.00	75.0AA	$ 4					
		VEG-lime, bag	Ton								
5	2, 3, 4	Tract 1225									
		Stream Crossings (576)									
5a		STREAM CROSS-ford, ex<80 cuft	4.0 Job	$ 600.00	75.0AA	$ 1,800					
5b		VEG-fert, 10-10-10, cwt	4.0 Cwt	$ 10.00	75.0AA	$ 30					
5c		VEG-lime, bag	0.2 Ton	$ 50.00	75.0AA	$ 8					
5d		VEG-seed, fescue	50.0 Lb	$ 0.97	75.0AA	$ 36					
5e		VEG-seedbed prep/seeding	0.2 Acre	$ 50.00	75.0AA	$ 8					
6	1, 2, 3, 4	Tract 1225									
	3	Tract 1226									

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ATURAL RESOURCES CONSERVATION SERVICE
arshall (Madison) Field Office (704) 649-3313

CONTRACT SUPPORT DOCUMENT

NO.: TOTAL ACRES: 39.6

scar Brigman | Madison County | NC

ITEM NO	FIELD	PLANNED CONSERVATION TREATMENT	EST. AMOUNT (UNITS)	COST / UNIT	COST SHARE %	ESTIMATED COST-SHARE BY YEAR 1998	1999	2000	2001	2002	2003
		TROUGH OR TANK (614)									
6a		FILTER CLOTH-geotextile fabric	231.0 SqYd	$ 2.00	75.0AA	$ 347					
6b		PIPE-water supply/fittings, <=2"	2200.0 LinFt	$ 1.50	75.0AA	$ 2,475					
6c		STONE-gravel	140.0 Ton	$ 12.00	75.0AA	$ 1,260					
6d		TANK-permanent watering	7.0 Each	$ 533.00	75.0AM	$ 2,798					
Total Cost-Share by Calendar Year:						$ 19,360					

SUMMARY	PROGRAM	CONTRACT NO.	TOTAL	1998	1999	2000	2001	2002	2003
Total Cost-Share by Fiscal Year:	WQ			$ 19,360					
Total Contract Cost-Share:	WQ		$ 19,360						

100% Total Cost = $25,813

A. All items numbered under "ITEM NO." must be carried out as part of this contract to prevent violation.
B. When established, the conservation practices listed as "PLANNED CONSERVATION TREATMENT" must be maintained by the participant at no cost to the government.
C. Enter total cost per unit under "COST/UNIT" unless the method of cost-share is flat rate. When flat rate, enter the amount per unit to be paid to the participant.
D. All cost share rates shown under "COST SHARE %" are based on average cost (AC) with the following exceptions:
AA = Actual costs not to exceed average cost
FR = Flat rate
NC = Non cost-shared
AM = Actual cost not to exceed a specified maximum
E. Total cost share by calendar year amounts may differ from those displayed in the SUMMARY section by fiscal year depending on what month the item is scheduled and on the fiscal year basis of the program.

Photos 1 & 2 show livestock watering facilities that can be installed on the landowner's property to eliminate the need for livestock to access the creek for water. These concrete boxes have water piped to them from a developed spring and the area around them hardened. Photo 2 shows the top of the structure where animals can drink. Excess water is piped to a tributary so that overflow does not cause muddy conditions. This flow through also reduces the possibility of freezing.

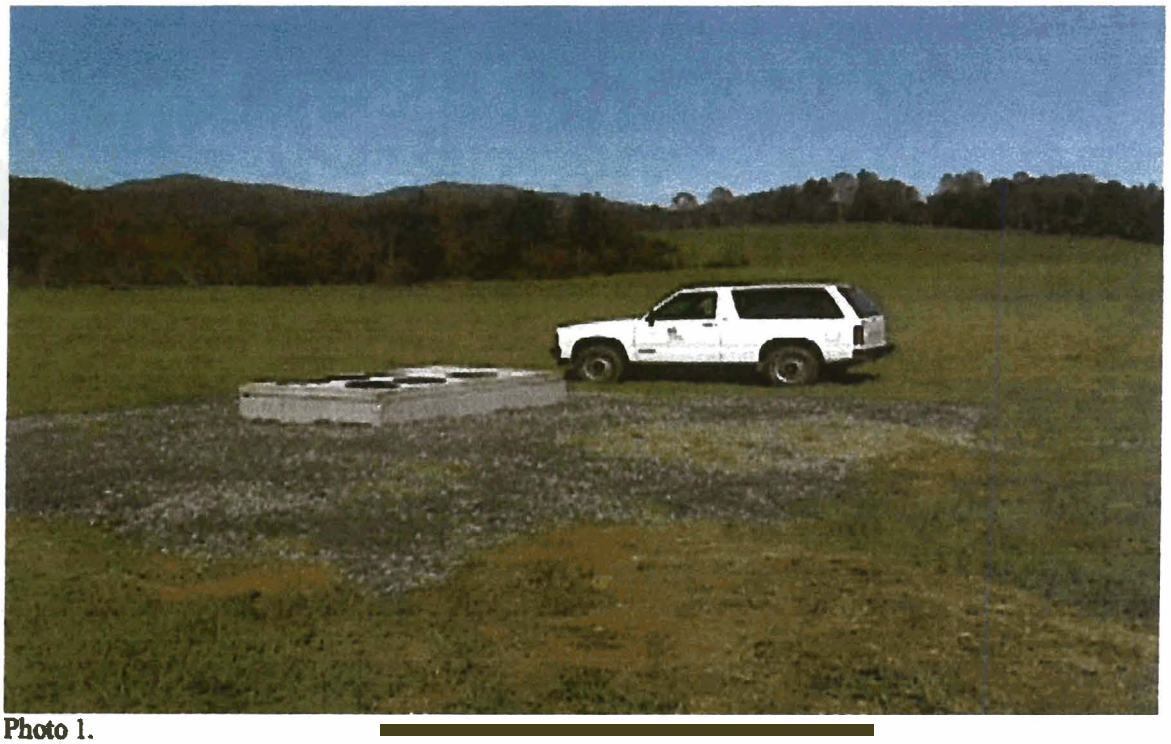

Photo 1.

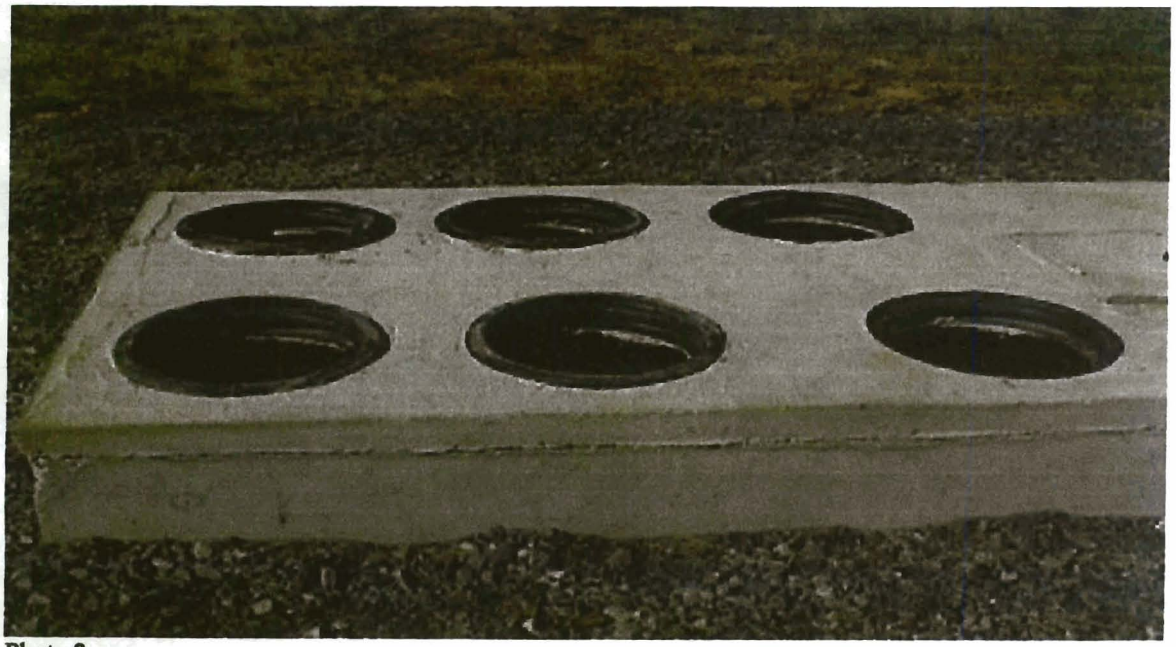

Photo 2.

Photo 1 & 2 show a rock vein used to protect an eroding section of stream bank. Rocks are stacked and pointed up stream at a 30° angle. This raises the stage of the water above the vein and since the mid-stream end of the vein is lower the water falls toward the middle of the stream. Photo 2 shows how the water level is higher upstream (to the right) of the rock vein.

Photo 1.

Photo 2.

Pictures 1 and 2 show rootwads used to stabilize a creek bank and provide fish habitat. The trunk of the tree is buried in the bank with the root fan exposed to the force of the current.

Picture 1

Picture 2