

Conceptual Restoration Plan

Phillips Site Middle Fork Creek

by

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and

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September, 2002

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 streams and riparian zones on their property. This plan gives the landowner the opportunity to evaluate the scope of work that is being proposed and to provide a basis for discussion regarding the acceptability of the proposal. We hope this plan will serve to put in black and white ideas or general concepts that we have already talked about. If, however, something in this plan is new or unacceptable, we want to discuss it and workout any problems if possible.

Once the landowner is satisfied with the basic ideas in this plan, the conservation easement document will need to be agreed upon. We will mark the easement boundary and meet with you to approve the lines. Once these are approved The North Carolina Department of Transportation (NCDOT), right-of-way personnel will be working with the Wildlife Resources Commission (NCWRC) to develop the easement agreement. They will have a crew survey the easement boundary as marked and described in this document and then we will sit down with you to review the easement document. NCDOT requires a right-of-entry form be signed by the landowner before their employees can enter the property. This is simply their permission to be on the property. When these steps are complete, we will be at the point where the landowner must decide to continue with the mitigation program or not. Once the easement is signed we will develop a more in depth construction plan and schedule a time when the work can begin. In general, nothing will be contained in the construction plan that has not been described in this plan. If something new comes up, it will be discussed with the landowner and included in the plan 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 the NCDOT to mitigate the public for streams that were placed in culverts in order to build Interstate 26 between Mars Hill and Sam's Gap. The biological value of these streams was lost due to this construction. By biological value, we mean their ability to support trout and other fish populations, to support angling for these fish, to provide habitat for wildlife and the many other benefits that streams provide the public. Streams and the organisms that they support are public resources. When these natural resources are destroyed the public and its interests are harmed. Since we can not replace the lost streams, we are trying to compensate the public for its loss by restoring or enhancing the biological value of other streams in the county that are degraded in some way.

Stream channel shape, both longitudinally and in cross-section, determines how well the stream resists erosion, reduces flooding impacts, and provides quality habitat for aquatic and terrestrial animals. We are hoping to improve the habitat value of project streams by reducing erosion, altering the shape of the stream so that it is more stable and by improving aquatic habitat. We are also concerned with enhancing the riparian zone. That is a strip of land of variable width on the sides of the stream. The width required to maintain a functional riparian zone depends on the size of the stream and the functions desired. The riparian zone is important to cold and cool water fish populations because

riparian vegetation provides the shade that keeps the water cold. This is very important in Madison County since many streams are at a relatively low elevation. Without shade, these streams will warm to a point where they no longer support cold and cool water fish. Riparian areas also provide resting, feeding and travel cover for many species of terrestrial wildlife. We have listed only a few of the many benefits gained by maintaining a natural riparian zone. A more extensive list of riparian functions can be found on the NCWRC website at: http://www.wildlife.state.nc.us/fs_index_03_fishing.htm . We are addressing improvements to streams by proposing enhancement measures for both the stream channel and the riparian zone.

Specific objectives for the Phillips site are described below. Recommendations for achieving these objectives are described in the next section.

1. Establish at minimum a 30-foot easement along Middle Fork Creek on each side of the stream, and a 15-foot easement on each side of the stream along the unnamed tributary.
2. Stop excessive erosion presently occurring along the banks of Middle Fork Creek and the fields. Realign the eroding channel reach to a more sinuous alignment. This will reduce the erosion that is presently occurring and allow the stream to move sediment through the reach.
3. Construct the realigned channel with natural methods/materials and stabilize the channel using native vegetation, especially woody vegetation. Utilize existing vegetation and substrate as much as possible.
4. Connect Middle Fork Creek and the unnamed tributary to their flood plains by lowering the banks at spots where this is needed and developing appropriate sinuosity along the channel.
5. Remove auto bodies from the banks of Middle Fork Creek and slope vertical banks to a more stable slope. Stabilize sloped banks with vegetation and meanders with rootwads or rock vanes.
6. Incorporate fish habitat improvement structures where possible along the project reach.
7. Construct a fence or other demarcation to protect the stream riparian buffer established through the conservation easement.
8. Establish appropriate livestock management practices to protect the stream from agricultural activities.

Plan Recommendations

Conservation Easement

A condition of participating in this mitigation program is that the landowners agree to place the stream riparian zone in a conservation easement. This plan shows a proposed easement boundary on the attached aerial photo and drawings (see appendix). When the landowners review this plan and accept its general concepts we will mark the easement line for their review prior to NCDOT surveying the line. Please review the proposed line and determine if the area incorporated into the easement is an aspect of this project you can accept. If there are problems, we can review the proposal and determine if alterations can be made. We have marked the line based on the size of the stream, the predicted frequency of flooding, the amount of land needed to provide a significant vegetative buffer of the stream and the existing problems. Before we move to the next stage, of marking and surveying the easement line and developing the easement document, we need to be in agreement on where this line will be. Fence installation may follow this boundary line and right-of-access to the easement area by NCWRC personnel will be stated in the agreement.

In general, the easement will include the existing vegetated buffer zone. It will need to be 30 to 40 feet on each side of Middle Fork Creek and 15 to 20 feet on each side of the unnamed tributary. This will impact existing fields the most where there is little distance between the creek bank and a field. However, in most of these cases the stream is cutting into the bank in these areas and eroding into the field. Once in the easement we will act to stop this erosion. Along the unnamed tributary, where the creek is close to the secondary road we propose having the easement run from the road right-of-way to a line on the far side of the creek. In areas where it is further from the road, we will mark a line on both sides of the stream. We will work with the landowner to identify how he would like to proceed in these areas. If the basic plans described in this document are acceptable, we will mark all of the easement lines and the landowner can evaluate their locations prior to committing to continuing with the program.

The easement agreement will be between the landowner and the Wildlife Resources Commission and be administratively established by the NCDOT. Note that NCDOT will pay you for the land placed in the easement as determined by the survey that we will have done if you agree to move to that step in the process. 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. A draft of a general easement agreement is attached in the appendix for your review. Please review the easement requirements and specifically the basic requirement that vegetation within the easement must be allowed to grow. This will maintain the stability of stream banks and provide important wildlife habitat. Note that this is only an easement draft and this document may need to be altered to better serve your long-term interests and the interests of the WRC. Specific consideration should be given to future stream crossings or other land uses that may need to be addressed by the easement. After you have reviewed this plan and the easement, we will discuss any concerns that you may have and jointly develop a final format.

Channel Improvements

This site is located in the Little Ivy Creek watershed and starts .3 miles upstream of the confluence of Middle Fork Creek and California Creek. The watershed is developed with a low density of homes. Primary land disturbing activities in the watershed are agriculture, road construction and development. Most of the flatter valleys are used to raise tobacco and cattle are grazed on steeper pastureland. Some forestlands within the watershed located along valleys and on less steep slopes were converted to agricultural land during the 1800's and early 1900's. A significant portion of the watershed is second or third growth forest. California Creek is a tributary to Middle Fork Creek and drains a large section of the I-26 project. It will probably continue to transport higher than normal volumes of sediment until the roadway is stable. The NC Department of Transportation is planning for the expansion of US Highway 19 within the next few years. The expansion of these roadways and their drainage systems will result in an increase in runoff and the rate of runoff to California, Middle Fork and Little Ivy Creeks. Channel alteration through increased erosion and sediment deposition from the higher flows is likely. At the present time, there is some conversion of agricultural and forest land to single family home sites. Construction of the Interstate through the county should increase this kind of development. Little Ivy Creek has suffered from land disturbing activities within the watershed. Much of the creek and its tributaries have been channelized or moved at some time in the past. Sedimentation of the creek has continued for many years as soil from fields, pastures and gravel roads has eroded into the creek.

The potential project site has two channels, Middle Fork Creek and an unnamed tributary. Middle Fork Creek flows across a relatively flat flood plain valley and has a low slope of .6 percent. The drainage area of the stream at the project site is 14 square miles. The channel is attempting to increase energy dissipation by extending meanders, cutting the stream banks and depositing sediment on the point bars. The presence of depositional features in the channel indicates it is carrying a high sediment load. A vegetated buffer of varying width is present over much of the reach but in places where it is absent, the channel has eroded into the adjacent fields. Past erosion has been addressed by placing crushed automobiles in the stream bank at some places on the reach. This was a common practice on this stream in the past and was promoted by some government agencies. Evaluation of the Middle Fork Creek channel along this site indicates that it is a C type stream in the Rosgen stream classification system. The unnamed tributary has a steeper channel with a slope of 4 percent. This tributary is very small and drains only .14 square miles at the confluence and .04 square miles at the beginning of the property. This channel has been impacted by livestock as they have used the stream as a source of drinking water. A section has been protected in a wooded buffer and serves as a good reference for stable conditions. This unnamed tributary channel varies in morphology over its length and has sections that are G, F and B; however, if stable it would most likely be a B type stream in the Rosgen stream classification system.

We propose to make alterations to the creek channel that will stop excessive erosion and provide long-term stability. All alterations will be made based on data collected from streams with similar dimension, slope, watershed size and similar hydrological conditions. This is called natural channel design based on a reference reach. The Middle Fork Creek channel will be realigned in a meandering pattern that one would expect for a C type

stream. Low slope streams carrying the bedload of this stream are generally meandering. This results in the force of the water decreasing as the water moves through the bends of the creek. The proper width and pool to riffle spacing will also be constructed. Meanders will be stabilized using rootwads and rock vanes (see appendix for photos). The meander pattern will fit within the easement area as described in other sections of this plan. Where stream banks are excessively high, they will be sloped to a more stable shape. While these activities are important to the stability of this channel, we will minimize impacting existing woody vegetation. Along Middle Fork Creek we will remove auto bodies and stabilize the banks using rootwads and vanes. The unnamed tributary will have a number of restoration approaches depending on existing conditions. The lower end which is very incised will have the banks sloped to allow the stream to access a lowered flood plain. We will attempt to work around and between the existing trees; however, some may have to be removed to make these alterations. The channel through the barnyard does not have a well-defined stream channel. We will define the channel through this section using coir rolls and filling behind them to develop a flood plain and stream bank that will support vegetation. In the middle pasture, eroding areas will be fixed using rootwads or rock vanes and existing soil berms will be removed. Multiflora rose bushes through this middle reach will be removed and destroyed. Rock vanes will also be used to address areas of significant drop in the channel. The upper section of this tributary does not need channel alterations.

Riparian Improvements

The existing riparian zone at this site varies in quality from areas with excellent riparian vegetation to areas with no vegetation. Middle Fork Creek has a vegetated buffer along most of the reach at this site. There are a few points along the stream where the buffer is absent and the creek has eroded into the adjoining field. Riparian vegetation includes tag alder, sycamore, black walnut, river cane, reed canary grass and nonnative multiflora rose. There are limited areas along Middle Fork Creek where the creek does not have a significant flood plain until it floods into the adjacent fields. The left bank, just upstream of the confluence with the unnamed tributary, is armored with old vehicles. This section is relatively straight, probably experienced erosion in the past and required protection. The unnamed tributary has varying amounts of riparian vegetation along its banks. On the stream in the lower field, there are a number of trees but overall the vegetated buffer is very thin. Much of the vegetation does not have a rooting depth that reaches the level of the stream. Some trees are also present along the middle reach of this tributary and they are protecting the banks. There is a small berm along the creek in the middle pasture. Where cattle have accessed the stream there is no woody vegetation.

We propose to improve the riparian zone at this site with a number of practices. Developing flood plains and connecting the stream to the flood plain along Middle Fork Creek and the lower section of the unnamed tributary will enhance stability. This natural condition allows high water to overflow the flood plain reducing flood velocity and improving water quality. Vertical banks will be sloped to 2:1 slope or less and vegetated. Automobile bodies will be removed and transported to the landfill. The banks will be stabilized using natural materials such as rock and rootwads. The channel in the barnyard area will be defined with coir rolls and soil filled in behind these rolls. This will create a

flood plain that is primarily soil and will support vegetation. Anywhere we do work in the riparian area will be protected with erosion control materials to provide stability until vegetation dominates the area. At high velocity points on the channel we will use coir fiber rolls and erosion control blankets. At lower velocity sites, we will stabilize the ground surface using only erosion control blankets. Both temporary ground cover and permanent riparian vegetation will be seeded under the erosion control blankets. 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 woody species such as alder, willow, red twig dogwood and button bush. On the upper banks, we will plant taller growing trees that will provide shade, wildlife cover and food, and will stabilize the creek banks. The kinds of native trees to be planted on the upper banks is flexible to take in the desires of the landowner, but generally we use those species commonly found on this creek. Any planting suggestions will be taken into consideration and utilized if possible. Note we will attempt to control non-native species within the easement area. In areas such as the barnyard, we will want to work with the landowner to plant vegetation that will be acceptable.

Please note that this work is not intended to stop flooding. On the other hand, it should also not increase the likely hood of flooding. It is an attempt to make the stream bank more stable when it does experience a flood event. At the same time we are increasing stream bank stability we want to improve fish and wildlife habitat through the practices that we employ.

Easement Protection and Agricultural Practices

An important part of our stream mitigation work is the exclusion of livestock from the riparian zone. On all of our projects we fence livestock out of all streams within the easement as well as installing other practices that this requirement might make necessary. As proposed this project site does not require fencing along the streams where livestock are not pastured; however, if the landowners desire that we place a fence along the established easement we will add this to the project proposal. The easement agreement will retain the right of the Wildlife Resources Commission to add a fence in the future if the protection of the easement is needed. If landowners do not want a fence at this time and choose to pasture livestock on their land in the future, they will need to construct a fence to keep livestock out of the easement area. If no fence is constructed the easement will be demarcated with 4x4 salt treated post placed at important points, but irregular intervals along the easement line. These posts will have a 3x8 inch sign on them that shows the site as a conservation easement area. We try to enhance the aesthetic value of these posts by working with a local Boy Scout troop to construct bluebird houses that will be placed on some of the post. While we must mark the easement area we are completely open to your suggestions regarding how to do it, so feel free to give us your preference.

Agricultural practices have been planned by Russell Blevins of the USDA-NRCS. A contract support document that he uses to plan agricultural practices is attached. This document shows the types of practices that are needed and the costs that the NCWRC will be covering to install these practices. The planned agricultural practices, as laid out in this document, fall in to four areas: a watering system, fencing, a stream crossing and a

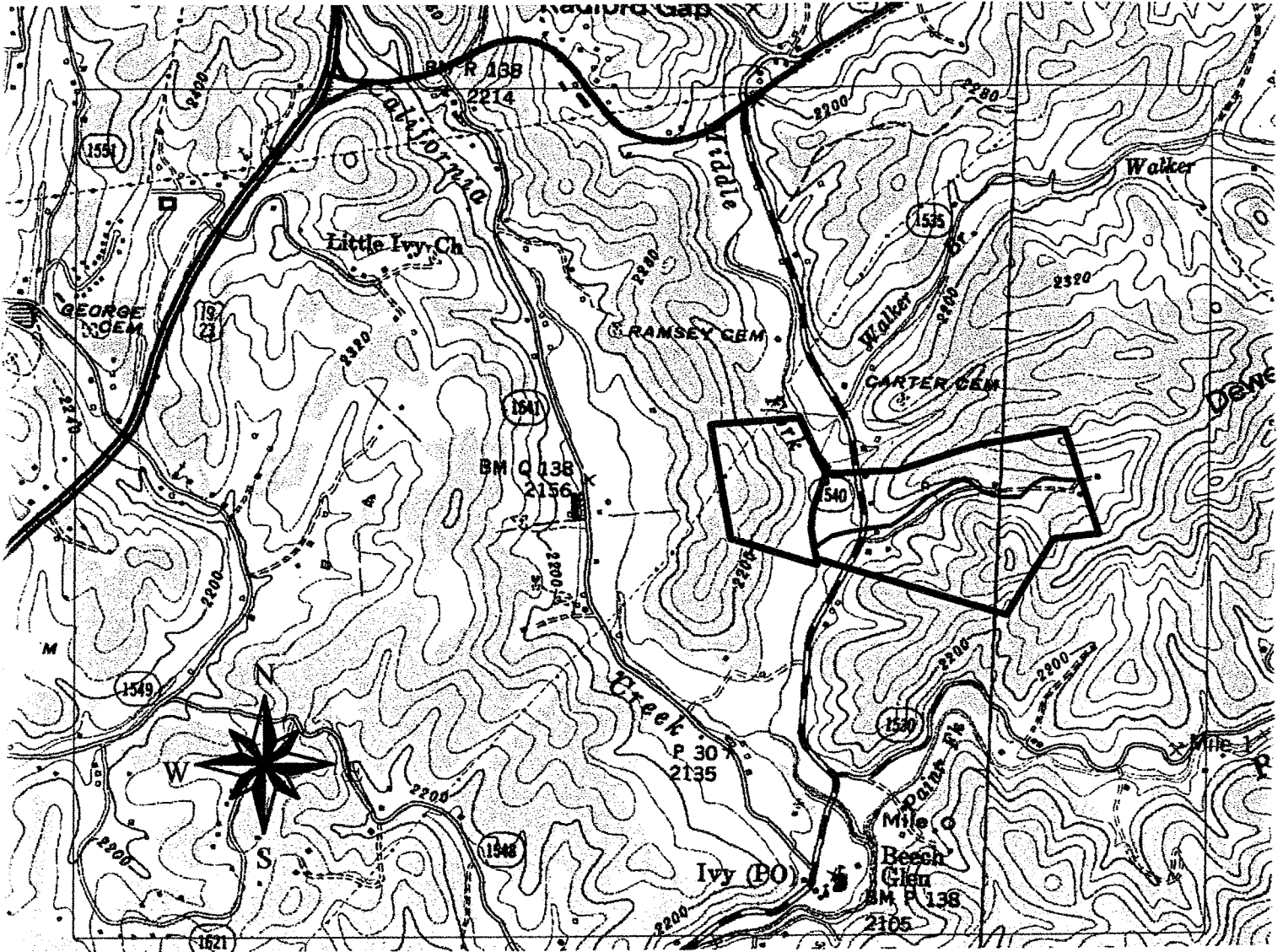
feeding/waste storage facility. The watering system will consist of a well that will need to be drilled, water lines to stock tanks, 6 stock tanks placed around the farm and protection of these watering areas against heavy use. The estimated cost of this watering system is \$13,896.00. Fencing has been planned for the unnamed tributary and totals approximately 4000 linear feet of fence. This includes fence, posts, gates and 6x6 posts for the gates. The total costs for fencing on the unnamed stream is estimated to be \$7,835.00. Fencing along the easement on Middle Fork Creek was not added to this proposal since we did not know the landowners desires relative to fencing along these fields. If a fence is desired along this area, it would approximately double the fencing cost to about \$15,000.00. There is an existing stream crossing on Middle Fork Creek that we propose to improve by placing a geotextile crossing structure in the bed of the creek. This structure is backfilled with gravel and provides a stable surface to cross the stream on. The structure is a proposal, which the landowner can decide on having, or not. We feel the structure is a better option for crossing streams but the existing crossing may be adequate for the farm needs. The cost for this stream crossing is estimated to be \$2,584.00.

Lastly, the plan proposes a feeding/waste storage facility that will be built away from any watercourses. This item is the only proposed practice for which we will not be paying 100% of the cost. We will be paying 25% of the cost and NRCS will be using a grant, which they have, to pay the remaining 75%. Typically the NRCS works with landowners by having them pay 25% and NRCS paying 75%; however, in this case the landowner pays nothing and the NCWRC pays what is normally their share. The cost of this structure is \$23,692.00, of which the NCWRC will pay \$5,923.00 and the NRCS grant will pay \$17,769.00. All of the locations of these practices are shown on the attached aerial photo of the farm. Any modifications that the landowner desires should be discussed with Russell and a NCWRC representatives. The total cost for these agricultural practices is \$48,007.00, of which the NCWRC will be paying \$30,238.00

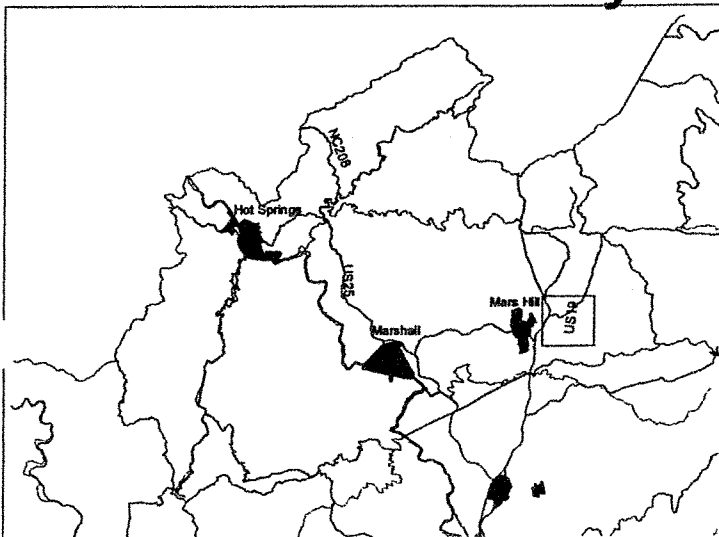
Appendix

1. Location of the Phillips mitigation site.
2. Pictures of existing conditions of streams at the Phillips mitigation site (6 pages).
3. Aerial photo of Middle Fork Creek reach showing approximate location of proposed easement lines.
4. Aerial photo of unnamed tributary to Middle Fork Creek showing approximate location of proposed easement lines.
5. Pictures of a rootwad revetment that is proposed for installation at this site.
6. Pictures of a vane structure that is proposed for installation at this site.
7. Contract Support Document from NRCS planning of agricultural practices. This document shows the costs of various planned practices.
8. Aerial photo of Phillips farm showing approximate location of proposed agricultural practices proposed by NRCS and WRC in this document.
9. Draft copy of the easement. This document can be altered to meet the needs and objectives of the parties entering the agreement.
10. Stream Channel Data taken on the streams at the Phillips mitigation site.
 - a. Location of cross-sections surveyed at this site. The little t designation is from site located on the unnamed tributary.
 - b. Cross-section data for streams (5 pages).
 - c. Longitudinal Profile of Middle Fork Creek at Phillips mitigation site (3 pages).
 - d. Longitudinal Profile of the unnamed tributary to Middle Fork Creek at Phillips mitigation site (3 pages).
 - e. Stream channel material size information for Middle Fork Creek (2 pages).

Phillips Site



Madison County



North Carolina

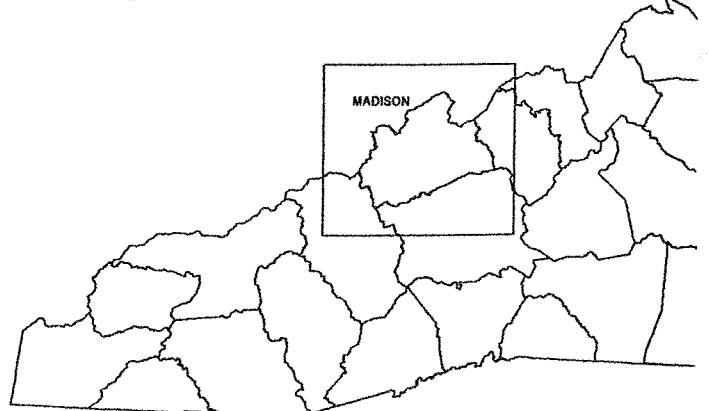




Photo showing multiflora rose as primary riparian vegetation.

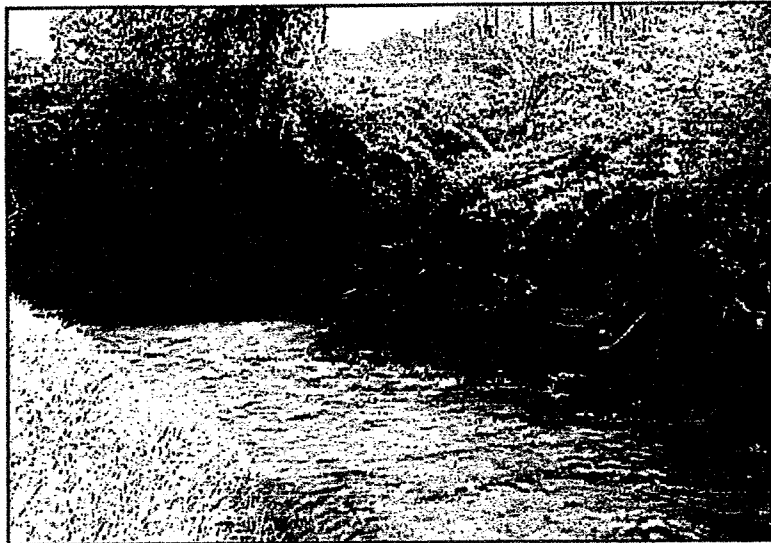


Photo showing vehicles used to stabilize bank in the past.

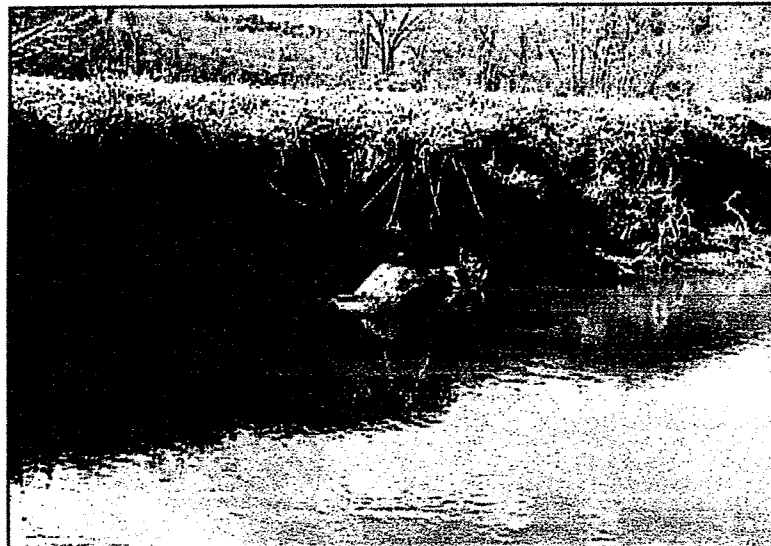


Photo showing area where the stream has eroded into the field.



Photo showing narrow forested buffer.



Photo showing stream cutting into the narrow forested buffer.

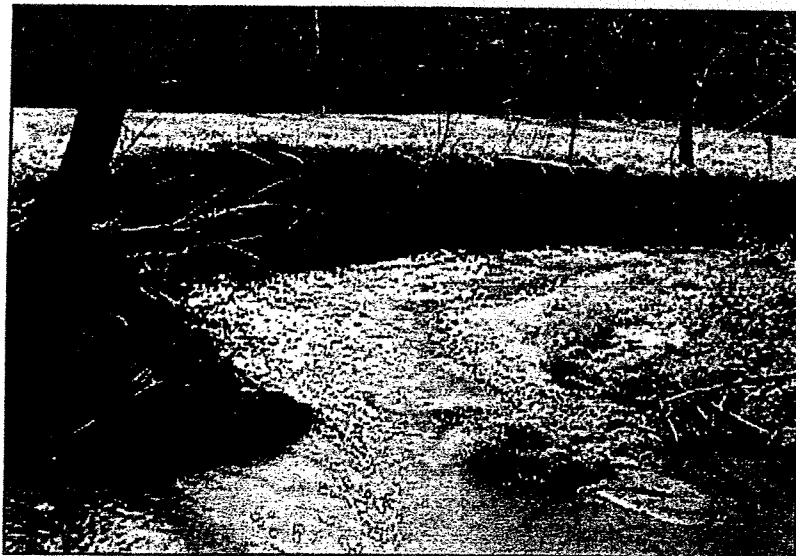


Photo showing stream cutting into field due to lack of vegetation.



Upper pasture, cross-section 6 ran from road to phone pole in upper left.



Second pasture below first culvert, cross-section 5 in this area.



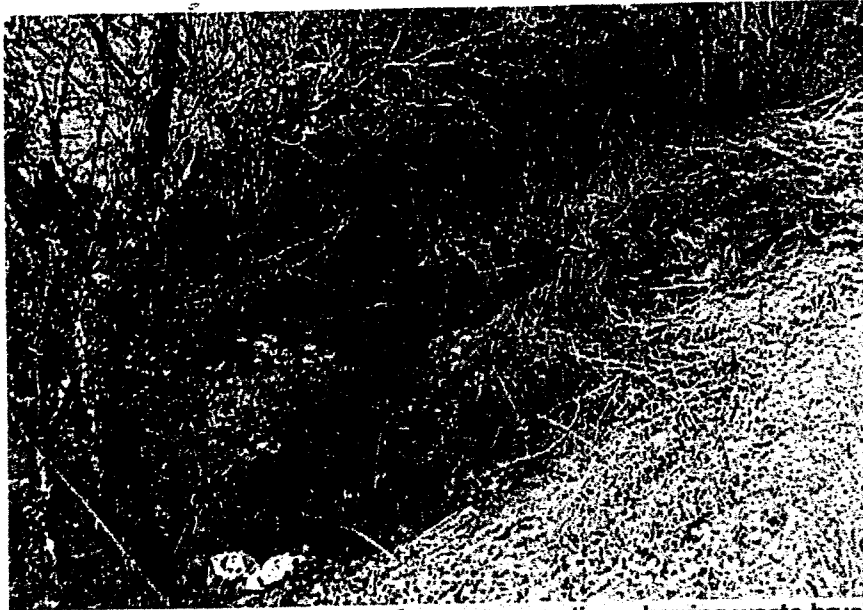
Third pasture below and across from trailer, no cross-sections in this area.



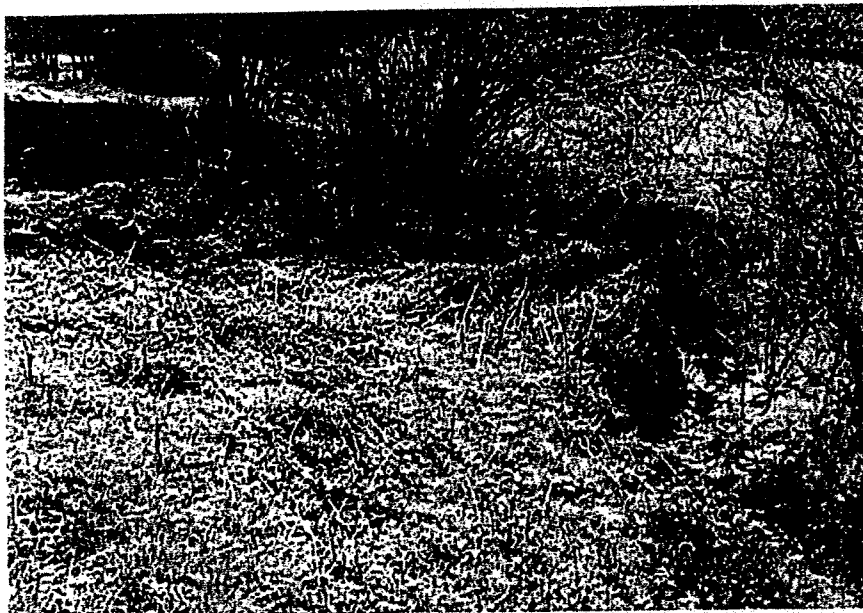
Channel between SR 1540 and Middle Fork Creek through fields.



Cross-section 1, in middle of channel between SR 1450 and Middle Fork Creek.



Reference area, looking upstream from cross-section, showing waste brush.



Reference area, looking downstream from cross-section at unvegetated area with erosion.



Stream through barnyard at intersection of SR 1540 and 1538, showing cross-section 2.



Lower end of 4th pasture below 2nd culvert, cross-section 4 at upper, middle of photo.



Reference cross-section (XS-3) in the middle of the site, below the multiflora rose thicket.



Upper pasture, cross-section 6 ran from road to phone pole in upper left.



Second pasture below first culvert, cross-section 5 in this area.



Third pasture below and across from trailer, no cross-sections in this area.



Photo showing narrow forested buffer.



Photo showing stream cutting into the narrow forested buffer.

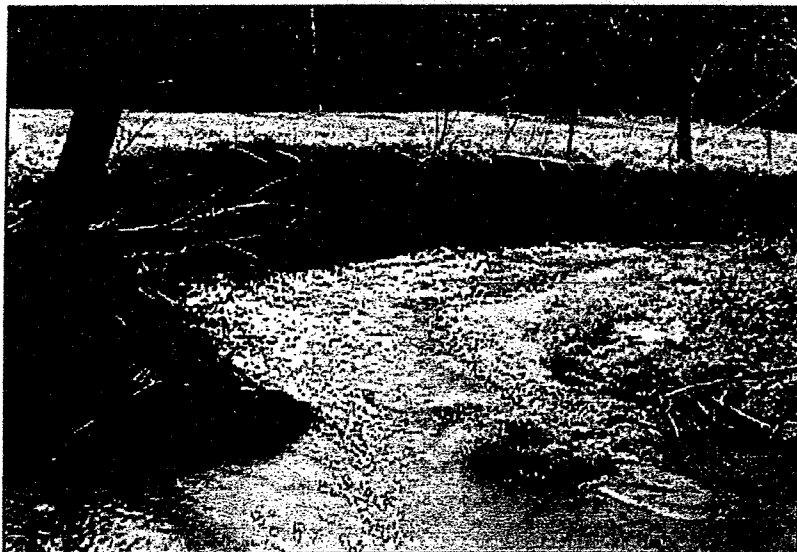


Photo showing stream cutting into field due to lack of vegetation.



Photo showing multiflora rose as primary riparian vegetation.

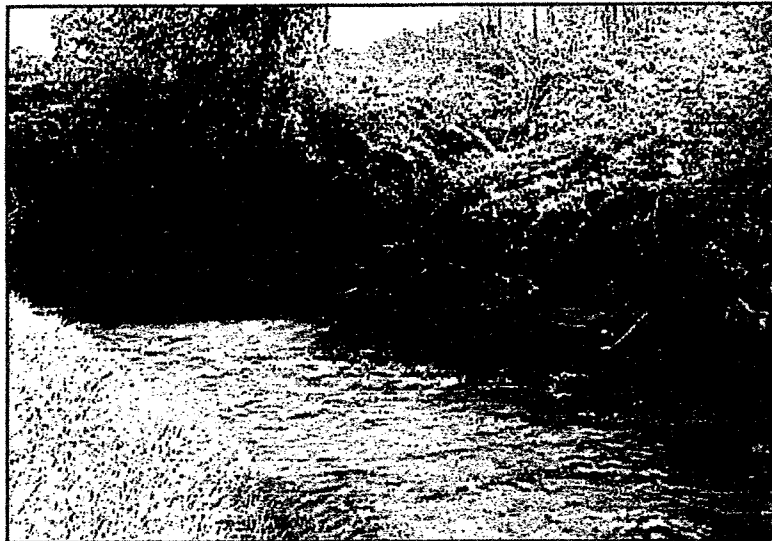


Photo showing vehicles used to stabilize bank in the past.

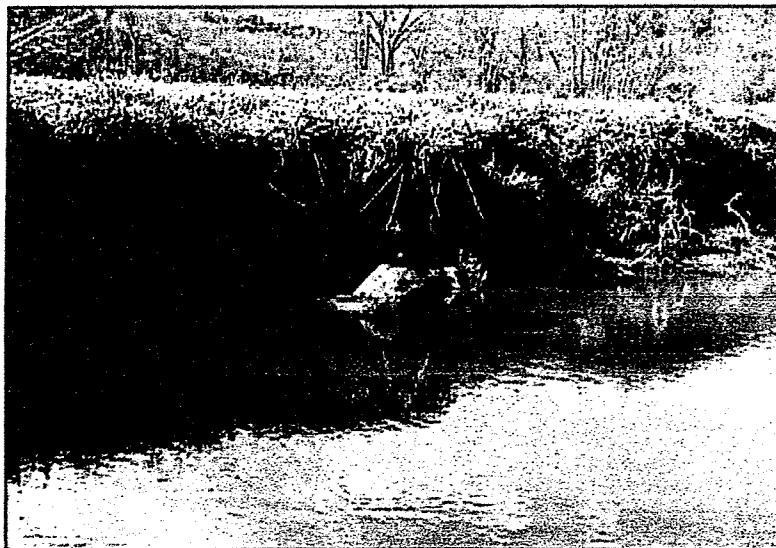
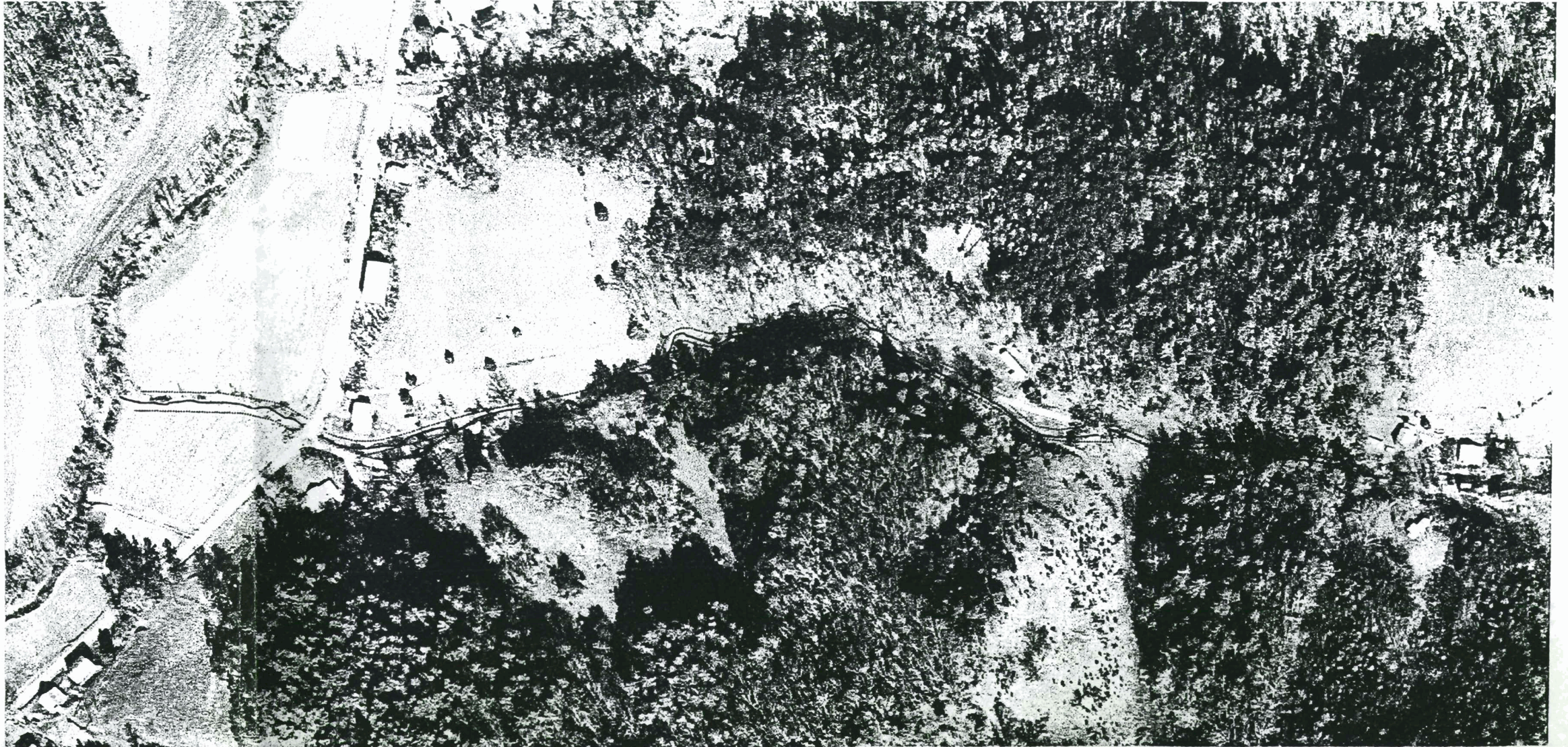


Photo showing area where the stream has eroded into the field.



Unnamed tributary to Middle Fork Creek on Phillips Property. Map shows the approximate location of proposed easement lines relative to the creek. Lines are based on 15 to 20 foot widths on each side of the creek.



Middle Fork Creek showing the approximate location of easement lines. Lines are based on a 40 feet width on each side of the primary stream and 20 feet of width on each side of the tributaries with the exception that the width was reduced to 15 feet within the barn yard area.

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.

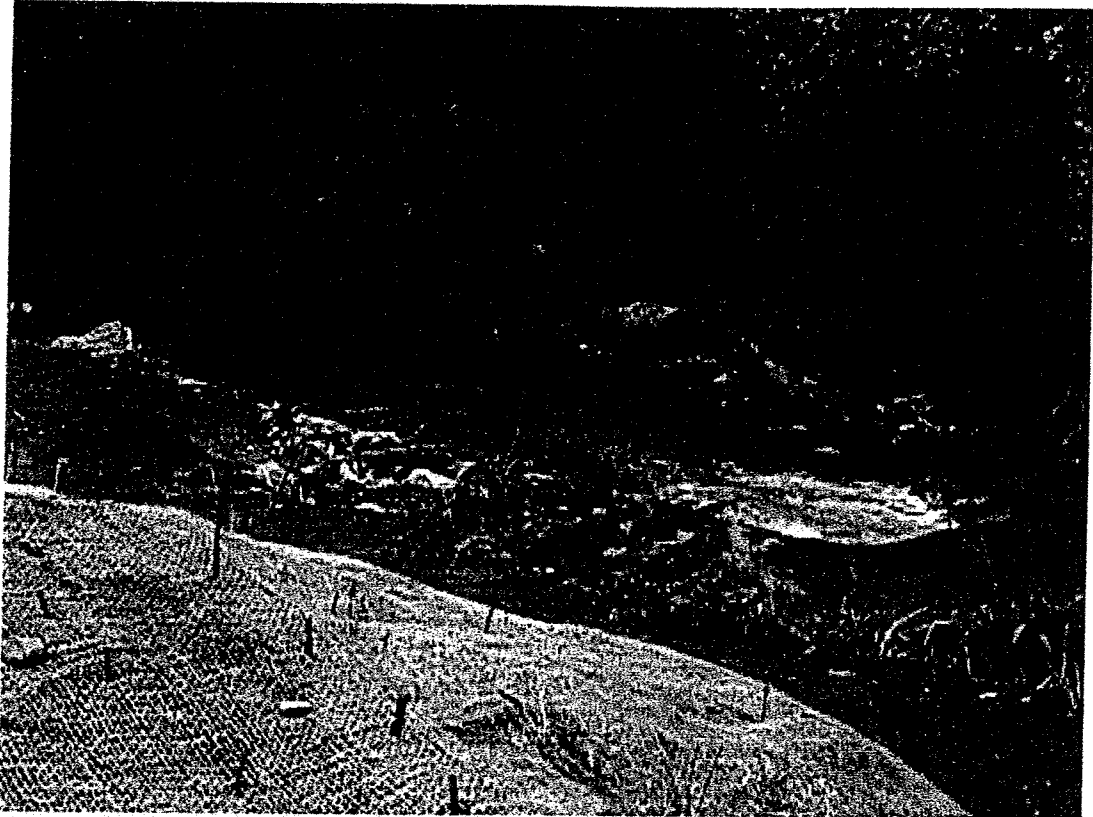


Picture 1

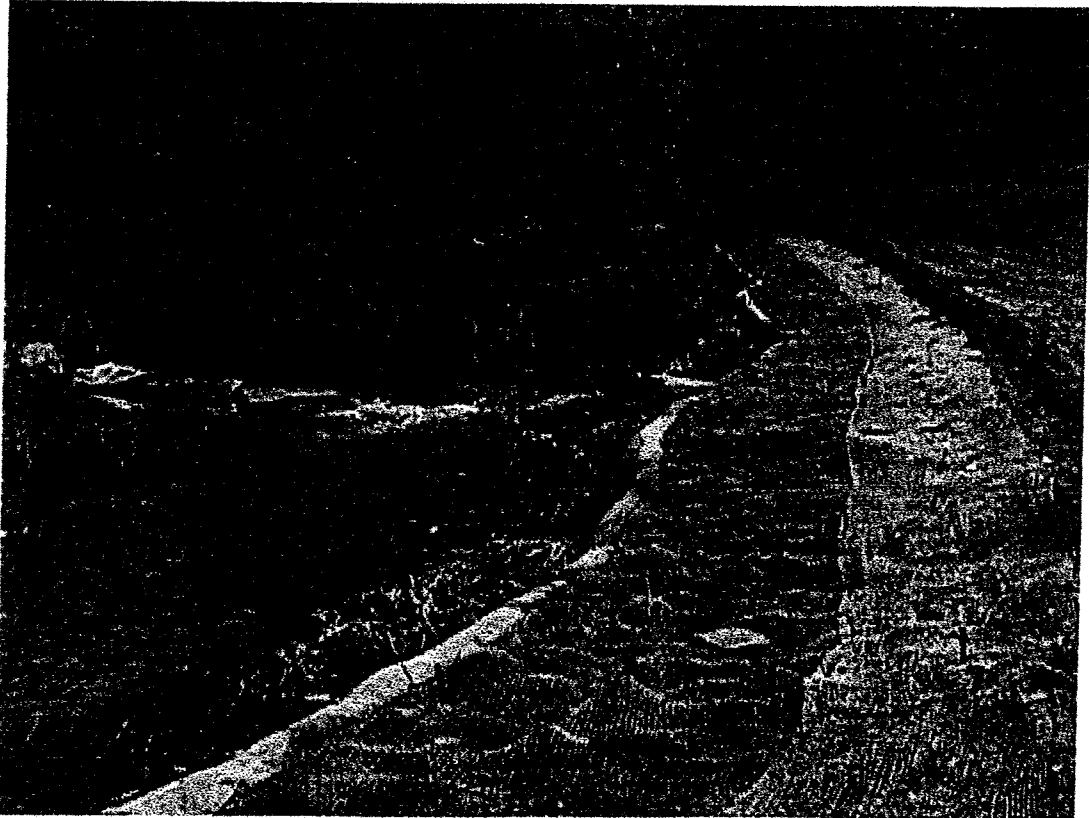


Picture 2

Pictures 1 and 2 show cross-vane structures used to stabilize the stream bank and create in-stream habitat. Picture 1 shows a vane built from hemlock logs and picture 2 shows a vane built from boulders.



Picture 1



Picture 2



USDA-NRCS
 Marshall FSC
 4388 US 25/70 Hwy
 Marshall, NC 28753
 (828)649-3313

NRCS-LTP-11-E

Russell Blevins
 District Conservationist

Contract Support Document

Mr. J. Bruce Phillips
 Rt.2
 Mars Hill, NC 28754

Contract Number: _____

Tract	Field	Item #	Planned Conservation Treatment	Estimated Amount	Units	Cost / Unit	Program	Cost Share	2003
		1	Waste Storage Facility (313)						
10	1	1b	Gates	1.0	No.	\$65.00	EPA	25.0%	\$16
		1d	Waste Appl frm retrofit/abandoned/existing systems	1.0	Job	\$20,000.00	EPA	25.0%	\$5,000
		2	Access Road (560)						
10	1	2a	Establish fescue vegetation using bag lime	1.0	Acre	\$266.00	EPA	25.0%	\$67
		2b	Lime (Bag)	2.0	tons	\$45.00	EPA	25.0%	\$23
		2c	Seedbed prep, est fescue using bag lime	1.0	Acre	\$316.00	EPA	25.0%	\$79
		2d	Mulch-Small grain straw (ac.)	1.0	Acre	\$300.00	EPA	25.0%	\$75
		3	Heavy Use Area Protection (561)						
10	1	3a	Geotextile fabric filter cloth	400.0	SqYd	\$2.00	EPA	25.0%	\$200
		3b	Gravel	125.0	Ton	\$14.80	EPA	25.0%	\$463
		4	Watering Facility (614)						
10	1	4a	3/4" to 1" Quick Coupling	6.0	Each	\$16.00	EPA	100.0%	\$96
		4b	Automatic Float Valve (brass)	6.0	No	\$18.00	EPA	100.0%	\$108
		4c	Geotextile fabric filter cloth	180.0	SqYd	\$2.00	EPA	100.0%	\$360
		4d	Gravel	132.0	Ton	\$12.00	EPA	100.0%	\$1,584
		4e	Watering Tank	6.0	No.	\$533.00	EPA	100.0% AM	\$3,198
		4f	Water supply pipe 2" or less plus fittings	3,000.0	Lft	\$1.65	EPA	100.0%	\$4,950
		5	Water Well (642)						
0	1	5a	Pump for livestock watering	1.0	No.	\$600.00	EPA	100.0% AM	\$600
		5b	Well Construction-incentive	1.0	Job	\$3,000.00	EPA	100.0% AM	\$3,000
		6	Fence (382)						
1		6a	Barbed wire fence (5 strands) installed	4,000.0	ft	\$1.70	EPA	100.0%	\$6,800
		6b	Gates	10.0	No.	\$65.00	EPA	100.0%	\$650
		6c	Add 6x6 post for gates includes concrete	20.0	each	\$19.25	EPA	100.0%	\$385

7 Stream Crossings (576)

10 1

7a	Geotextile fabric filter cloth	4.0	SqYd	\$100.00	EPA	100.0%	\$400
7b	Stream crossing excavation, < 80 cu ft, FORD TYPE	1.0	Job	\$600.00	EPA	100.0%	\$600
7c	Gravel	132.0	Ton	\$12.00	EPA	100.0%	\$1,584

Total Cost-Share by Calendar Year \$30,238

100% = 48,000.00

Total Contract Cost-Share \$30,238

- NOTES:
- A. All items numbered under "Item #" 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

This information is used in both the development and implementation of a Conservation, Reclamation or Water Quality plan as the basis for technical assistance and/or cost sharing. The authorities for such work are: 16 U.S.C. 590a-f (Soil and Water Conservation); 16 U.S.C. 590h(b) (Agriculture Conservation); 16 U.S.C. 590p(b) (Great Plains); 30 U.S.C. 1236 et seq. (Rural Abandoned Mine Reclamation); 43 U.S.C. 1592(c) (Colorado River Basin Salinity Control); The Food Security Act of 1985, Public Law 99-198; Federal Agriculture Improvement and Reform Act of 1996, Public Law 104-127 and the regulations promulgated thereunder. Furnishing information is voluntary and will be confidential; however, it is necessary in order to receive assistance.

By signing, the participant acknowledges receipt of this practice schedule and agrees to comply with the terms and conditions hereof.

CERTIFICATION OF PARTICIPANTS

Mr. J. Bruce Phillips _____ Date

CERTIFICATION OF:

District Conservationist
 Russell Blevins _____ Date

CONSERVATION DISTRICT
 Madison County SWCD _____ Date

OTHER SPONSORING AGENCY
 NC Wildlife Resources Commission _____ Date



Agricultural practices that are proposed to offset impacts to farming activities on Phillips Property. Map shows the approximate location of proposed fencing, watering system, stream crossing, and feeding structure.

NORTH CAROLINA
_____ COUNTY

**CONSERVATION EASEMENT and
EASEMENTS OF INGRESS AND EGRESS**

THIS CONSERVATION EASEMENT and EASEMENTS OF INGRESS AND EGRESS, made this _____ day of _____, 2001, by and between _____ [include address], hereinafter called the "Grantor(s)" and the North Carolina Wildlife Resources Commission, Division of Inland Fisheries, 1721 Mail Service Center, Raleigh, NC 27699-1721, hereinafter called the "WRC," and administered by the North Carolina Department of Transportation, hereinafter called the "NCDOT," provides the following:

WITNESSETH

WHEREAS, the Grantor is the sole owner in fee simple of certain real property in _____ Township of _____ County, North Carolina, as more particularly described in Book ___, Page ___ and Book ___, Page ___ of the _____ County Registry, North Carolina, which land is hereinafter referred to as "the Property";

WHEREAS, the NCDOT is an agency of the State of North Carolina whose purpose includes the construction of transportation projects for public use and who has the authority to acquire land for the purpose of mitigating environmental impacts of these transportation projects;

WHEREAS, the NCDOT desires to restore _____ feet of stream in _____ County on the said Property through the WRC:

WHEREAS, the WRC is an agency of the State of North Carolina whose purposes include the restoration and conservation of open space and streams for stream mitigation purposes; is authorized by the laws of the State of North Carolina to accept, hold and administer conservation easements; and who has the authority to accept and is willing to accept this Conservation Easement from the Grantor under the terms and conditions hereinafter described;

WHEREAS, the Grantor is willing to grant a perpetual Conservation Easement over ___ acres of the Property (the Conservation Easement Area), thereby restricting and limiting the use of land within the Conservation Easement Area to the terms and conditions and for the purposes hereinafter set forth, and to further grant both a Temporary and Permanent Access Easement of Ingress and Egress to the Conservation Easement Area upon and along the Property as more particularly set forth hereinafter;

WHEREAS, the Uniform Conservation and Historic Preservation Agreements Act, N.C.G.S. § 121-34 et. seq., provides for the enforceability of restrictions, easements, covenants or conditions appropriate to retaining land or water areas predominantly in their natural, scenic or open condition or in agricultural, horticultural, farming or forest use;

WHEREAS, the NCDOT, under a Section 404 permit granted by the U. S. Army Corps of Engineers (USACE), must conduct certain off-site trout stream enhancement to mitigate for impacts to trout streams resulting from the construction of I-26 corridor from northeast of US 19 to the Tennessee state line at Sam's Gap (TIP No. A-10 C & D);

WHEREAS, the NCDOT has entered into an agreement with the WRC to reimburse them for

conducting the mitigation activities;

WHEREAS, the USACE has reviewed and approved the use of the Conservation Easement on the Property to mitigate for the stream impacts, and such will satisfy the said permit conditions after the completion of the stream monitoring period;

WHEREAS, the purposes of this Conservation Easement are to protect the mitigation activities performed by the WRC, to preserve and protect the conservation values of the Conservation Easement Area, to prevent any use of the Conservation Easement Area that will significantly impair or interfere with these purposes, and to maintain permanently the dominant woodland, scenic and natural character of the Conservation Easement Area designated on the Property as hereinafter described.

NOW THEREFORE, in consideration of the sum of \$ _____
(_____) and other valuable considerations to the Grantor in hand paid by the NCDOT, the receipt of which is hereby acknowledged, and in further consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, the Grantor hereby grants and conveys unto the WRC and its successors or assigns forever and in perpetuity a Conservation Easement, pursuant to the USACE Section 404 permit requirements, of the nature and character and to the extent hereinafter set forth, in respect to the land of the grantor situated in _____ County, North Carolina, as described in **Exhibit A**, and hereinafter referred to as the "Conservation Easement Area"; together with a Temporary Access Easement of Ingress and Egress ("Temporary Access Easement") and a Permanent Access Easement of Ingress and Egress ("Permanent Access Easement") over and upon the remaining Property of the Grantors described in Book ____, page ____, and Book ____, page ____ of the _____ County Registry as a means of ingress and egress to and from the Conservation Easement hereinabove described, as more particularly described in **Exhibit B**. For a plat of the above described Conservation Easement and Easements of Ingress and Egress, please see plat titled "Conservation Easement" recorded in Plat Book ____, Page ____ of the _____ County Registry.

The terms, conditions and restrictions of the Conservation Easement are as hereinafter set forth:

ARTICLE I. DURATION OF EASEMENTS; ACCESS

A. **Conservation Easement.** This Conservation Easement shall be perpetual. It is an easement in gross, runs with the land and is enforceable by the WRC or its successors and/or assigns against the Grantor(s), Grantor(s) heirs, devisees, successors and assigns, lessees, agents and licensees.

B. **Temporary Access Easement.** It is specifically understood by all parties to this document that a Temporary Access Easement over the Property, as described more particularly in **Exhibit B**, will be valid until the completion of the construction and monitoring of the stream mitigation project within the Conservation Easement Area of said Property of the Grantor. The NCDOT, the WRC, and authorized representatives of the WRC, shall have the right to access the Conservation Easement Area through the Property over this Temporary Access Easement in order to conduct the mitigation activities, and shall have the right to place equipment and materials on the Temporary Access Easement. Upon completion of the monitoring period of said stream mitigation project, as described in **Exhibit C**, the Conceptual Stream Mitigation Plan, the Temporary Access Easement will dissolve and no longer be a part of the Conservation Easement and this document.

C. **Permanent Access Easement.** In addition to the access provided by the Temporary Access Easement described above, and continuing in perpetuity after said Temporary Access Easement has dissolved, the NCDOT, the WRC, and authorized representatives of the WRC, shall have the right in

perpetuity to enter the Conservation Easement Area through the Property over this Permanent Access Easement, as described more particularly in **Exhibit B**, at all reasonable times to undertake additional mitigation activities as determined to be necessary by the NCDOT or WRC.

Further, the NCDOT, the WRC, and authorized representatives of the WRC, shall have the right in perpetuity to enter the Conservation Easement Area through the Property over this Permanent Access Easement in perpetuity, at all reasonable times, for the purpose of inspecting said Conservation Easement Area to determine if the Grantor is complying with the terms, conditions, restrictions, and purposes of this Conservation Easement. The NCDOT or WRC will notify the Grantor by phone, email, or other correspondence before entering the Property for this purpose. However, if the NCDOT or WRC in its sole discretion determines that circumstances require immediate entry, such party is not required to notify Grantor prior to entry but will notify Grantor within two business days of such entry.

D. Public Access. The easement rights granted herein do not include public access rights. However, the public has the right to view the Conservation Easement Area from any adjacent publicly accessible area.

ARTICLE II. PROHIBITED, RESTRICTED AND RESERVED ACTIVITIES

Any activity on, or use of, the designated Conservation Easement Area inconsistent with the purposes of this Conservation Easement is prohibited. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of the Conservation Easement. The Conservation Easement Area shall be maintained in its natural, scenic and open condition and restricted from any development that would significantly impair or interfere with the conservation values of this Conservation Easement Area. Any rights not expressly reserved hereunder by the Grantor have been acquired by the WRC.

Without limiting the generality of the foregoing, the following activities and uses are expressly prohibited, restricted or reserved as indicated hereunder:

1. Disturbance of Natural Features. Any changes, disturbance, alteration or impairment of the natural, scenic and aesthetic features of the Conservation Easement Area or any introduction of non-native plants and/or animal species is prohibited unless the WRC shall give its prior written consent or unless otherwise expressly permitted herein.

2. Agricultural, Grazing and Horticultural Use. Agricultural, grazing and horticultural use, including landscaping, of the Conservation Easement Area is prohibited. Livestock shall only cross or access water at areas appointed and agreed upon in the Conceptual Stream Mitigation Plan, attached as **Exhibit C**, and shown on the plat entitled "Conservation Easement" recorded in Plat Book _____, Page _____, of the _____ County Registry. Grantors may have limited access to the Conservation Easement Area for the purpose of operating irrigation pumps. In an emergency situation, in which no other water source is available, livestock may access the stream for water at areas designated on the plat entitled "Conservation Easement" recorded in Plat Book _____, Page _____, of the _____ County Registry. Such emergency access is limited to one side of the stream for a length not to exceed 30 linear feet and the Grantor shall notify the WRC in writing at the address shown above within 3 business days of such access.

3. Silvicultural Use and Land Clearing. There may be no destruction or cutting of trees

or plants in the Conservation Easement Area, except in accordance with the Conceptual Stream Mitigation Plan, attached hereto as **Exhibit C**, or upon written approval of the WRC. The gathering of firewood in the Conservation Easement Area shall be limited to dead trees, such that the gathering is consistent with purposes of this Conservation Easement. Removal of large live trees may be allowed in some cases provided that any such request is consistent with the purposes of this Conservation Easement and the Grantor obtains prior written approval from the WRC.

4. Hunting and Fishing. Grantor expressly reserves the right to hunt and fish on the Conservation Easement Area and to control access of all persons for the purpose of hunting and fishing; provided that these activities do not impact the protection and conservation of any wildlife habitat or other conservation values of the Conservation Easement Area.

5. Dumping or Storage. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or hazardous substances, or toxic or hazardous waste, or any placement of underground or aboveground storage tanks or other materials on the Conservation Easement Area is prohibited.

6. Mineral Use, Excavation, Dredging. There shall be no filling, excavation, dredging, mining or drilling; no removal of topsoil, sand, gravel, rock, peat, minerals or other material, and no change in the topography of the land in any manner on the Conservation Easement Area nor shall there be any activities conducted on the Conservation Easement Area or on adjacent property if owned by the Grantor and his successors which would cause erosion or siltation on the Conservation Easement Area.

7. Industrial Use. Industrial activities in the Conservation Easement Area are prohibited.

8. Residential Use. Residential use of the Conservation Easement Area is prohibited.

9. Commercial Use. Commercial activities in the Conservation Easement Area are prohibited

10. New Construction. There shall be no building, shed, facility, mobile home, or other structure constructed or placed in the Conservation Easement Area; provided, however, that the WRC expressly reserves the right to install, operate and maintain structures for the purpose of reestablishing, protecting, and enhancing stream functional values, including those described in the Conceptual Stream Mitigation Plan, **Exhibit C**, for the Conservation Easement Area.

11. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Protected Property and the holder of the Conservation Easement, and signs giving directions or proscribing rules and regulations for the use of the Conservation Easement Area.

12. Subdivision. Subdivision, partitioning, or dividing the Conservation Easement Area is prohibited.

13. Development Rights. No development rights which have been encumbered or extinguished by this Conservation Easement shall be transferred pursuant to a

transferable development rights scheme or cluster development arrangement or otherwise.

14. Utilities. The installation of utility systems, including, without limitation, water, sewer, power, fuel, and communication lines and related facilities, is prohibited. If there are existing utility easements (rights of way) located in the Conservation Easement Area or affecting the Conservation Easement, Grantor shall notify the WRC if right of way clearing or other work in the Conservation Easement Area is scheduled by the utility.

15. Water Quality and Drainage Pattern. Grantor shall conduct no activities conducted in the Conservation Easement Area that would be detrimental to water purity or to any of the plants or habitats within the Conservation Easement Area, or that would alter natural water levels, drainage, sedimentation and/or flow in or over the Conservation Easement Area, or cause soil degradation or erosion. Diking, dredging, alteration, draining, filling or removal of wetlands or stream by the Grantor is prohibited. In addition, Grantor is prohibited from diverting or causing or permitting the diversion of surface or underground water into, within or out of the Conservation Easement Area by any means; polluting or discharging into waters, springs, seeps, or wetlands; or using pesticides or biocides in the Conservation Easement Area unless agreed to in writing by the WRC.

16. Grantor's Rights. The Grantor, for himself, his successors, assigns, invitees and licensees, hereby reserves the right to quiet enjoyment of the Conservation Easement Area; the right of ingress and egress to the Conservation Easement Area and all adjacent property of the Grantor; the right to continue such uses as exist as of the date of this grant not inconsistent with this Conservation Easement; and the right to sell, transfer, gift or otherwise convey the Conservation Easement Area, in whole, provided such sale, transfer or gift conveyance is subject to the terms of this Conservation Easement and written notice is provided to the WRC in accordance with the provisions herein below.

17. WRC's Rights. The WRC reserves the right to use the Conservation Easement Area in any way necessary, consistent with the terms herein, to undertake any activities to protect, restore, manage, maintain, or enhance stream functional values, and monitor the restoration resources, as described in the Conceptual Stream Mitigation Plan (**Exhibit C**) for the Conservation Easement Area, in order to mitigate for impacts to streams resulting from road construction. These mitigation activities include, but are not limited to, construction of new stream channels; restoration/stabilization of existing stream channels; installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow; planting of trees, shrubs and herbaceous vegetation; and utilization of heavy equipment to grade, fill, and prepare the soil. The WRC further reserves the right to monitor the results of the mitigation activities in perpetuity and to repair or restore any damage to the Conservation Easement Area occurring after initial completion of the construction associated with mitigation activities.

ARTICLE III. ENFORCEMENT AND REMEDIES

Nothing contained herein shall be construed to entitle the Grantor or WRC to bring any action against the other party for any injury or change in the Property resulting from causes beyond the control of either party, including fire, flood, storm, war, acts of God or third parties, or from any prudent action taken in good faith by either party under emergency conditions to prevent, abate, or mitigate significant

injury to life, damage to property or harm to the Conservation Easement Area resulting from such causes, in accordance hereunder.

The WRC has the right to prevent any action on or use of the Conservation Easement Area that is inconsistent with the purpose of this Conservation Easement and to require the restoration of such areas or features of the Conservation Easement Area that may be damaged by any inconsistent activity or use. If the WRC determines that the Grantor is in violation of the terms of this Conservation Easement or that a violation is threatened, WRC shall give written notice to Grantor of such violation and demand corrective action sufficient to cure the violation and, where the violation involves injury to the Conservation Easement Area resulting from any use or activity inconsistent with the purpose of this Conservation Easement, to restore the portion of the Conservation Easement Area so injured. If Grantor fails to cure the violation within thirty (30) days after receipt of notice thereof from WRC, or under circumstances where the violation cannot reasonably be cured within a thirty (30) day period, fails to begin curing such violation within the thirty (30) day period, or fails to continue diligently to cure such violation until finally cured, WRC may bring an action at law or in equity in a court of competent jurisdiction to enforce the terms of this Conservation Easement, to enjoin the violation, as necessary, by temporary or permanent injunction, to recover any damages to which it may be entitled for violation of the terms of this Easement, including damages for the loss of conservation values, and to require the restoration of the Conservation Easement Area to the condition that existed prior to any such injury. If the WRC, in its sole discretion, determines that circumstances require immediate action to prevent or mitigate significant damage to the conservation values of the Conservation Easement Area, the WRC may pursue its remedies without prior notice to the Grantor. WRC shall exercise reasonable efforts to notify the Grantor and shall, in any event, notify Grantor within two business days after action is taken to explain the action undertaken.

WRC's remedies shall be cumulative and shall be in addition to any other rights and remedies available to WRC at law or equity. Any cost incurred by WRC in enforcing the terms of this Conservation Easement against Grantor or its successors or assigns, including, without limitation, costs of suit and attorney's fees, and any costs of restoration necessitated by Grantor's violation of the terms of this Conservation Easement shall be borne by Grantor.

No failure on the part of the WRC to enforce any covenant or provision hereof shall be a waiver to discharge or invalidate such covenant or any other covenant, condition, or provision hereof or affect the right of WRC to enforce the same in the event of a subsequent breach or default.

The Grantor reserves the right to take action against the WRC for use of the Conservation Easement Area in a way that is inconsistent with the purpose of this Conservation Easement. Any cost incurred by Grantor in enforcing the terms of this Conservation Easement against WRC or its successors or assigns, including, without limitation, costs of suit and attorney's fees, shall be borne by WRC.

ARTICLE IV. MISCELLANEOUS

A. Amendments. The NCDOT, WRC and Grantor may amend this Conservation Easement, Temporary Access Easement, or Permanent Access Easement only by a jointly executed written agreement, and provided that no amendment will be allowed that is inconsistent with the purposes stated herein, and provided that it is approved by the USACE.

B. Exhibits. The attached Exhibit A, Exhibit B, Exhibit C and Plat recorded in Plat Book _____, Page ___ of the _____ County Registry are incorporated in and made a part of this instrument by reference. The parties acknowledge that the Conceptual Stream Mitigation Plan, developed by a WRC biologist and dated _____ (Exhibit C), a copy of which is on file at the office of the NCDOT and

the WRC, and which is also attached hereto and incorporated herein, describes the plan for mitigation activities in the Conservation Easement Area.

C. Title. The Grantors covenant and represent that the Grantors are the sole owner and are seized of the Property in fee simple and have good right to grant and convey the aforesaid Conservation Easement and Temporary and Permanent Access Easements of Ingress and Egress; that the Conservation Easement Area and Temporary and Permanent Access Easements are free and clear of any and all encumbrances, except easement and leases of record or in effect by prescriptive rights as of the date hereto, and Grantors covenant that the WRC shall have the use of and enjoy all of the benefits derived from and arising out of the aforesaid easements conveyed. The easements conveyed herein shall run with the land and must be made part of any transfer of title by the Grantors.

D. Notification. Except as otherwise provided herein, any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown above or to other address(es) as either party establishes in writing upon notification to the other.

E. Entire Agreement. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and Easements of Ingress and Egress and supersedes all prior discussions, negotiations, understandings or agreements relating to the said easements. If any provision is found to be invalid, the remainder of the provisions of this Conservation Easement, and the application of such provision to persons or circumstances other than those as to which is found to be invalid, shall not be affected thereby.

F. Recording. The NCDOT shall record this instrument and any amendment hereto in timely fashion with the Office of the Register or Deeds of _____ County, North Carolina, and may re-record it at any time as may be required to preserve its right under this Conservation Easement.

G. Costs and Liabilities. The Grantor retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep, and maintenance of the Property, including the maintenance of adequate comprehensive general liability insurance coverage. Grantor shall keep the Property free of any liens arising out of any work performed for, materials furnished to, or obligations incurred by Grantor. Grantor shall pay before delinquency all taxes, assessments, fee, and charges of whatever description levied on or assessed against the Property by competent authority (collectively, "taxes"), including any taxes imposed upon, or incurred as a result of, this Conservation Easement, and shall furnish WRC with satisfactory evidence of payment upon request.

H. Construction of Terms. This Conservation Easement shall be construed to promote the purposes of the North Carolina enabling statute set forth in N.C.G.S. § 121-34, which authorizes the creation of Conservation Easements for purposes including those set forth in the recitals herein, and the conservation purposes of this Conservation Easement, including such purposes as are defined in Section 170(h)(4)(A) of the Internal Revenue Code.

I. Authorized Representative. All parties agree that the NCDOT is an authorized representative of the WRC for purposes of this Conservation Easement and Easements of Ingress and Egress.

J. Conservation Purpose. The WRC, for themselves, and their successors and assigns agree that this Conservation Easement shall be held exclusively for conservation purposes. The parties hereto recognize and agree that the benefits of this Conservation Easement are in gross and assignable, provided, however, that the WRC hereby covenants and agrees that in the event they transfer or assign this Conservation Easement they hold under, the organization receiving the interest will be a qualified organization as that term is defined in Section 170(h)(3) of the Internal Revenue Code of 1986 (or any

successor section) and the regulations promulgated thereunder, which is organized or operated primarily for one of the conservation purposes specified in Section 170(h)(4)(A) and section 2301 of the Internal Revenue Code, and the WRC further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue to carry out in perpetuity the conservation purposes that the contribution was originally intended to advance, set forth in the Recitals herein.

TO HAVE AND TO HOLD the aforesaid Conservation Easement and Easement of Ingress and Egress unto the NORTH CAROLINA WILDLIFE RESOURCES COMMISSION, its successors and assigns, forever. The rights and obligations set forth herein shall inure to and be binding upon the Grantor and the WRC, their heirs, executors, NCDOTs, assigns and successors in title or interest.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals and caused this instrument to be signed in their respective names by authority duly given, the day and year first above written.

GRANTOR(S):

_____ name _____ name

NORTH CAROLINA, COUNTY OF _____

I, _____ a Notary Public of _____ County do hereby certify that _____, Grantor(s), personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this ____ day of _____, 2001.

Notary Public

My Commission Expires: _____

NCDOT:

ACCEPTED FOR THE DEPARTMENT OF TRANSPORTATION BY:

name and title

NORTH CAROLINA, COUNTY OF _____

I, _____ a Notary Public of _____ County do hereby certify that _____, of the North Carolina

Department of Transportation, personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this ____ day of _____, 2001.

Notary Public

My Commission Expires: _____

WRC:
ACCEPTED FOR THE WILDLIFE RESOURCES COMMISSION BY:

name and title

NORTH CAROLINA, COUNTY OF _____

I, _____ a Notary Public of _____ County do hereby certify that _____, _____ of the North Carolina Wildlife Resources Commission, personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this ____ day of _____, 2001.

Notary Public

My Commission Expires: _____

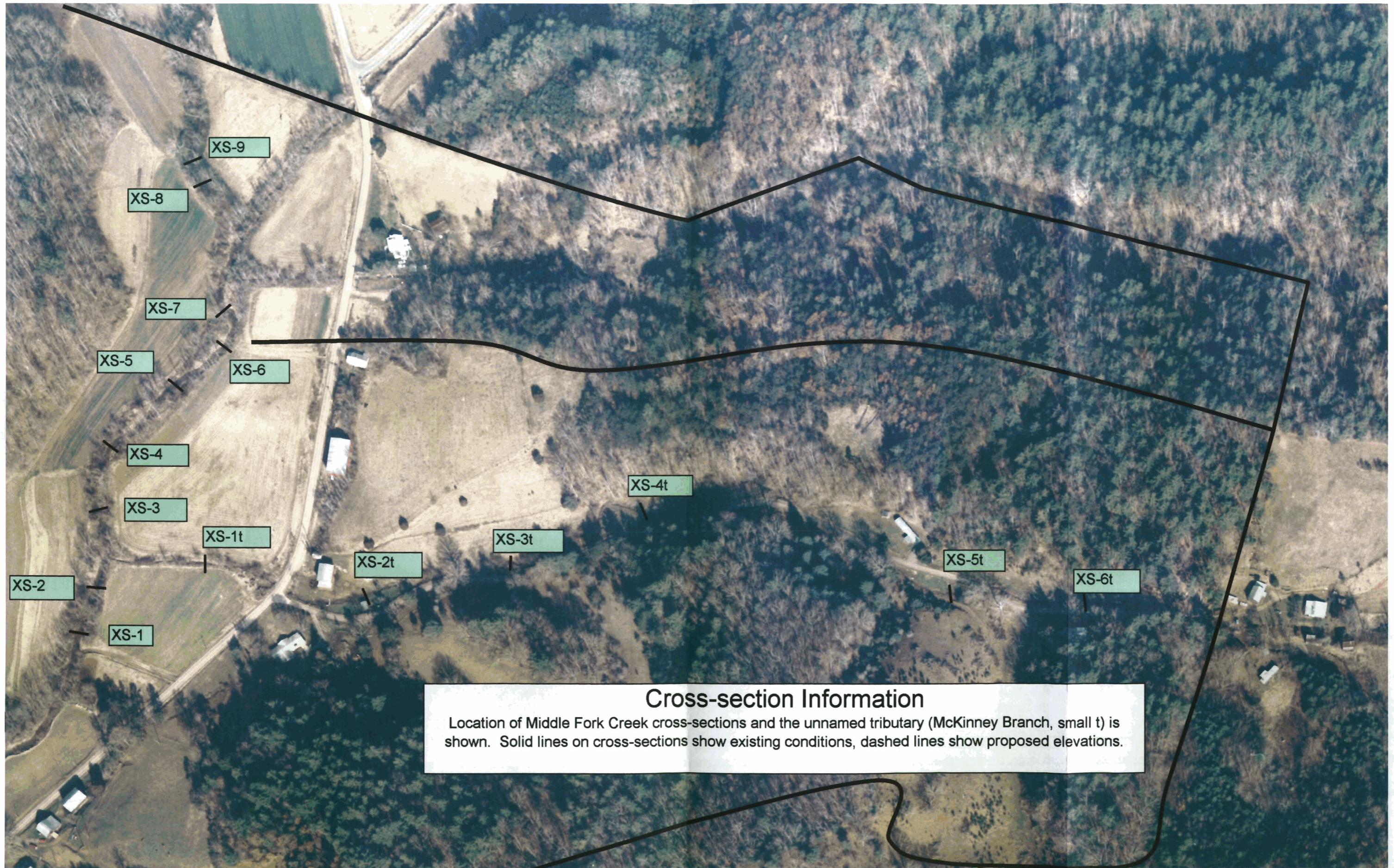
The foregoing Certificate(s) of _____
Notaries/Notary Public, is/are certified to be correct.
This instrument and this certificate are duly registered at the date and time and in the Book and Page shown on the first page hereof.
This the ____ day of _____, 2001.

Register of Deeds For _____ County

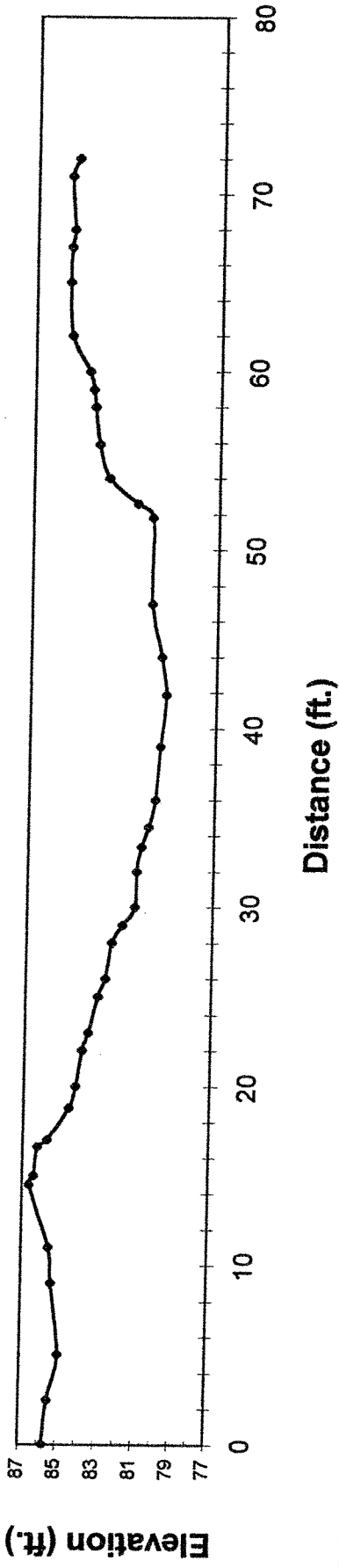
BY: _____
Deputy/Assistant Register of Deeds

**Stream Channel Data
for
Middle Fork Creek and an unnamed tributary**

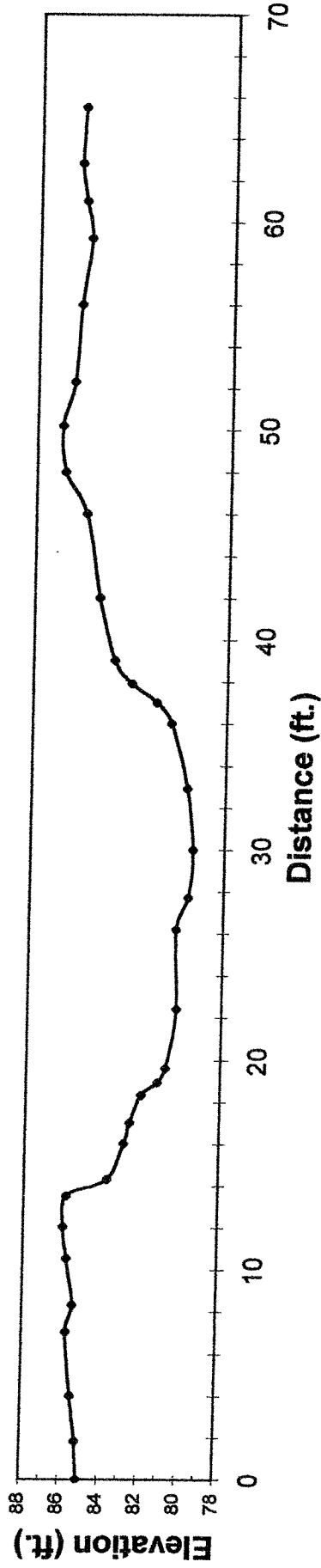
Phillips mitigation site



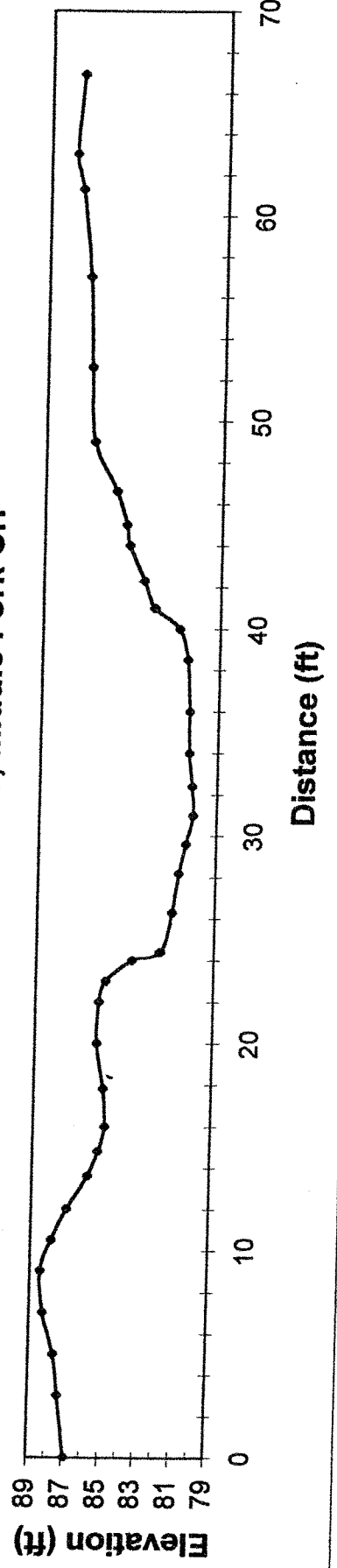
Cross-section 1, Middle Fork Cr.



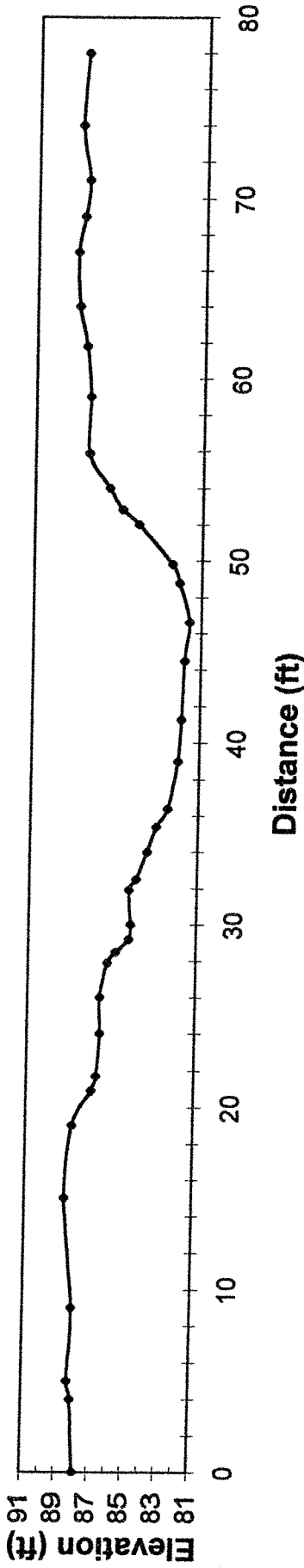
Cross-section 2, Middle Fork Cr.



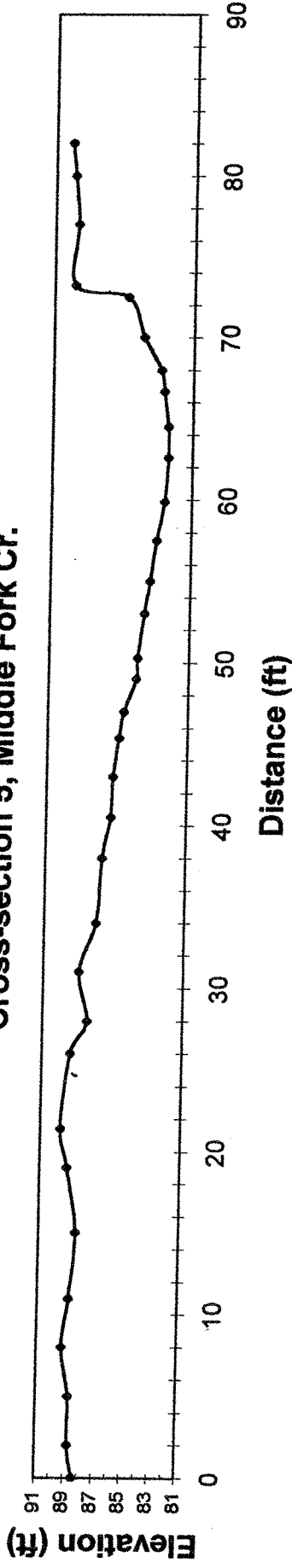
Cross-section 3, Middle Fork Cr.



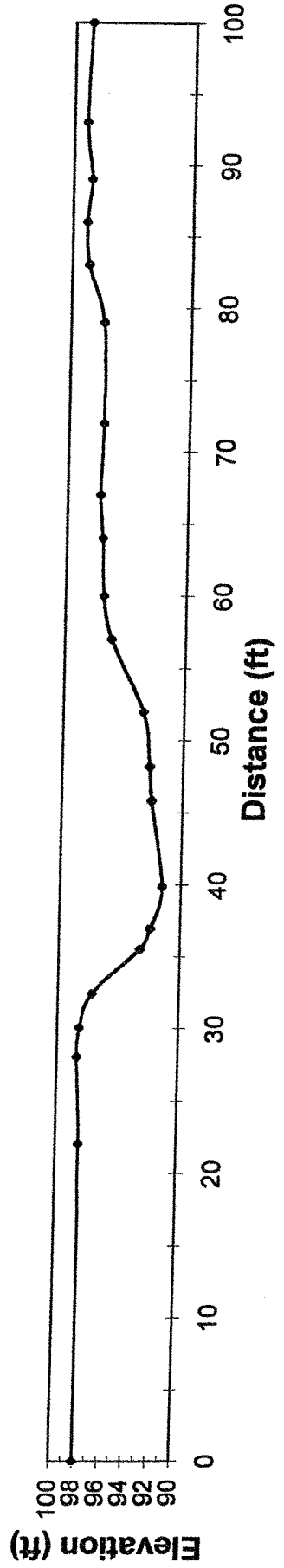
Cross-section 4, Middle Fork Cr.



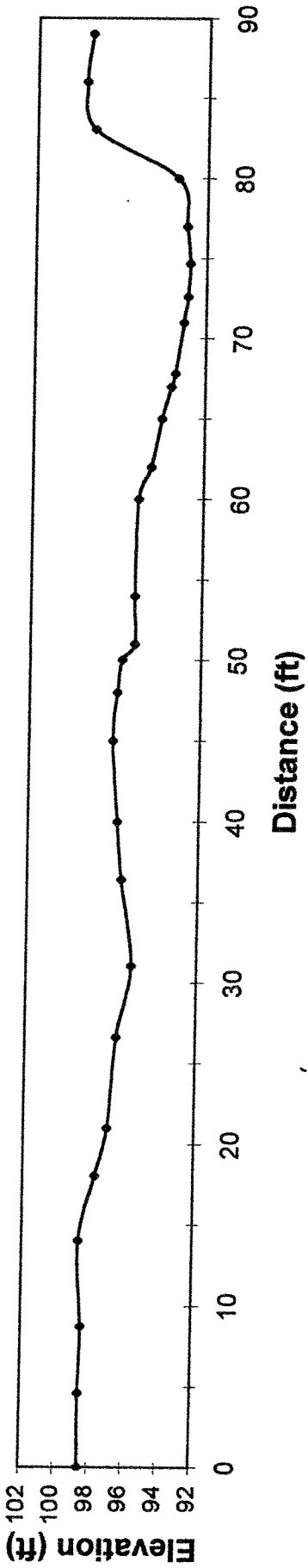
Cross-section 5, Middle Fork Cr.



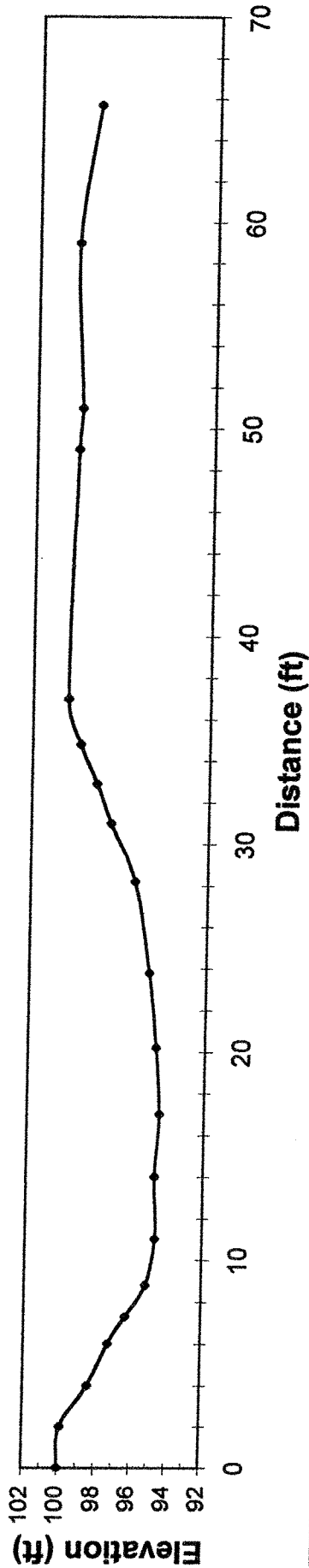
Cross-section 6, Middle Fork Cr.



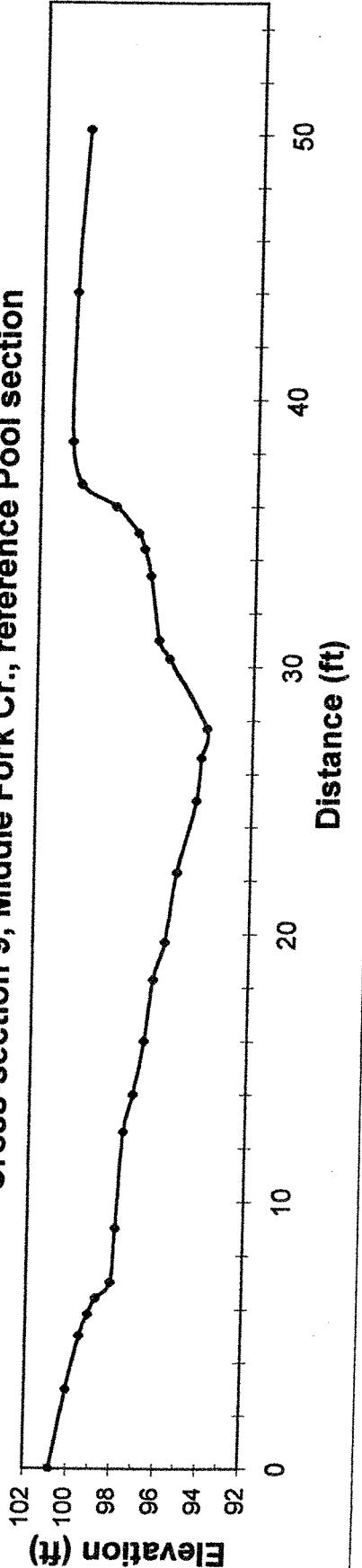
Cross-section 7, Middle Fork Cr.

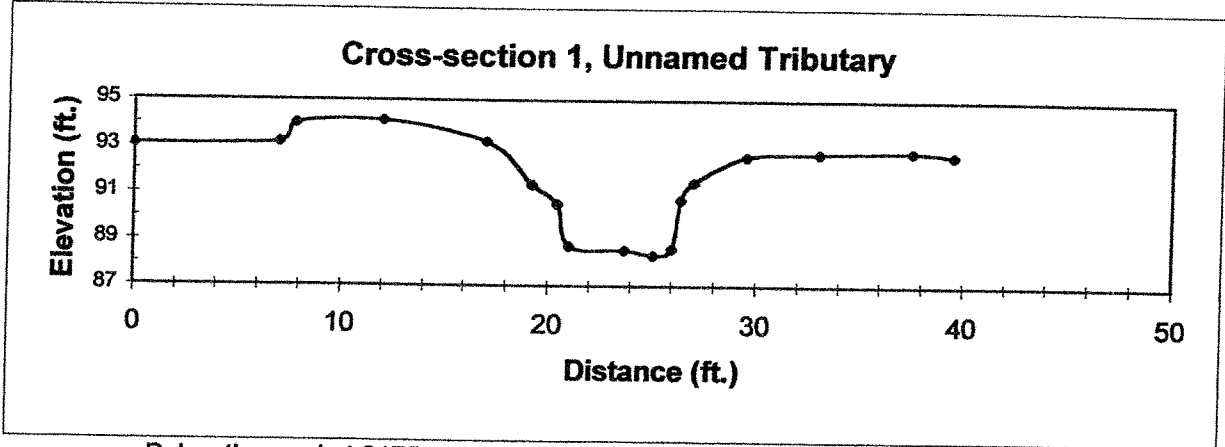


Cross-section 8, Middle Fork Cr., reference Riffle section

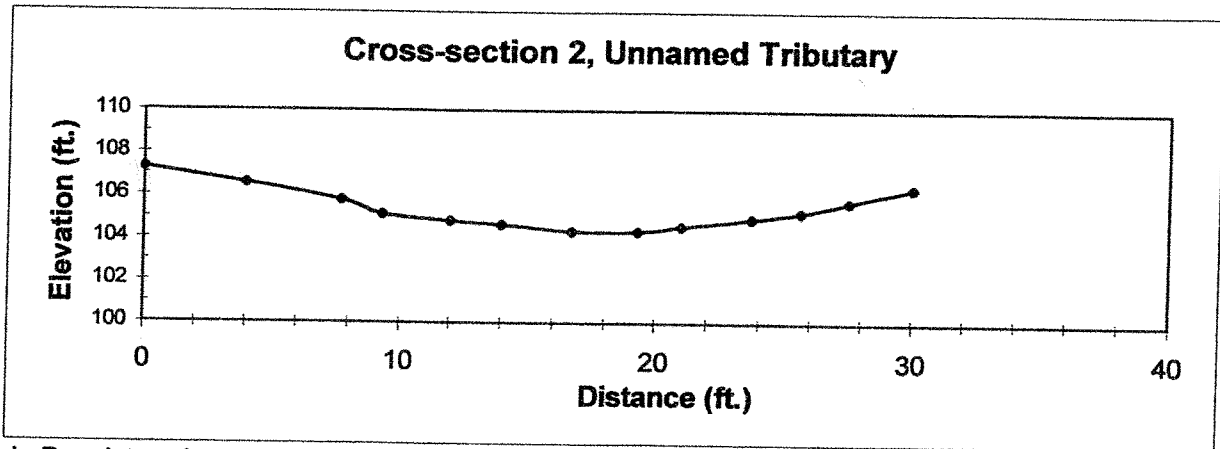


Cross-section 9, Middle Fork Cr., reference Pool section

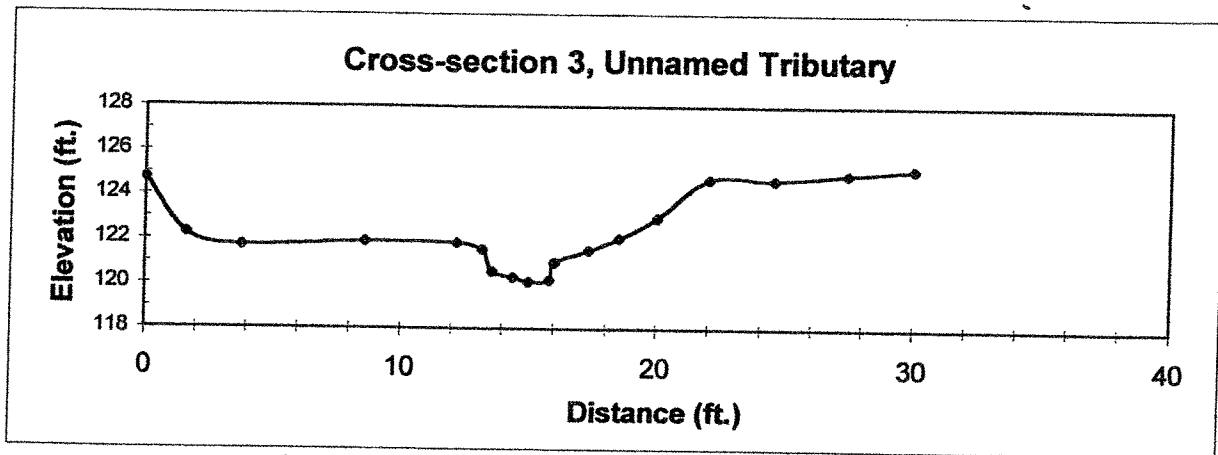




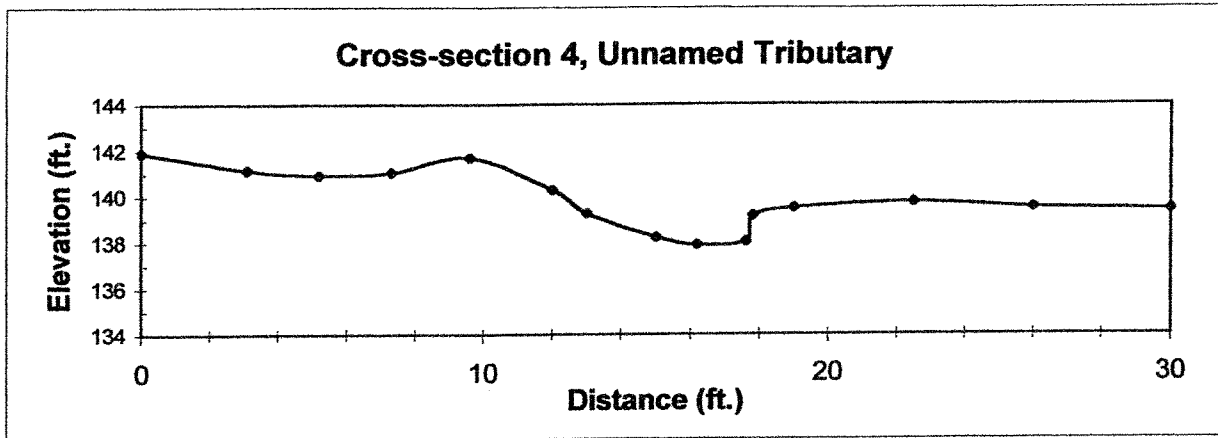
Below the road at 2175 on profile midway between the road and Middle Fork Creek.



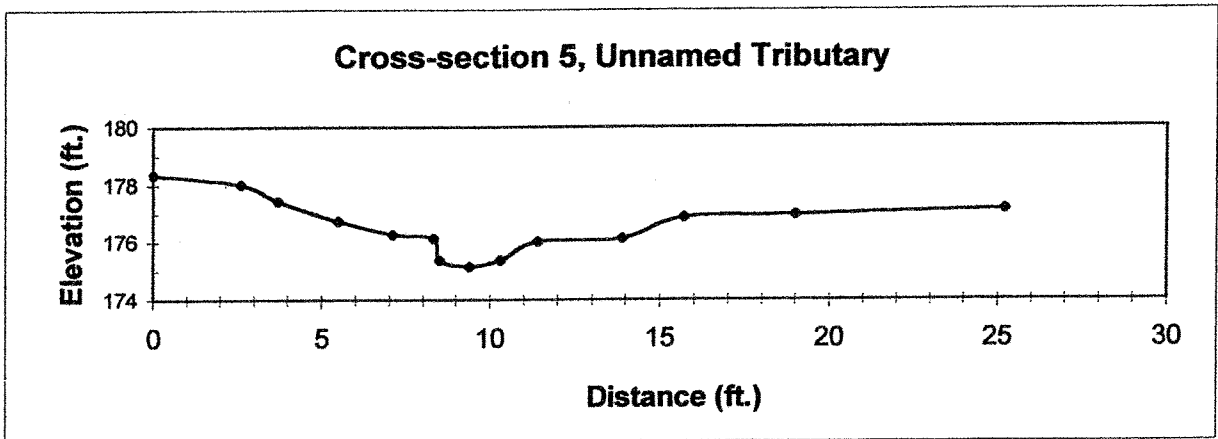
In Barn lot, xs just above the spring house at 2175 on LP. Channel is Braided with little habitat.



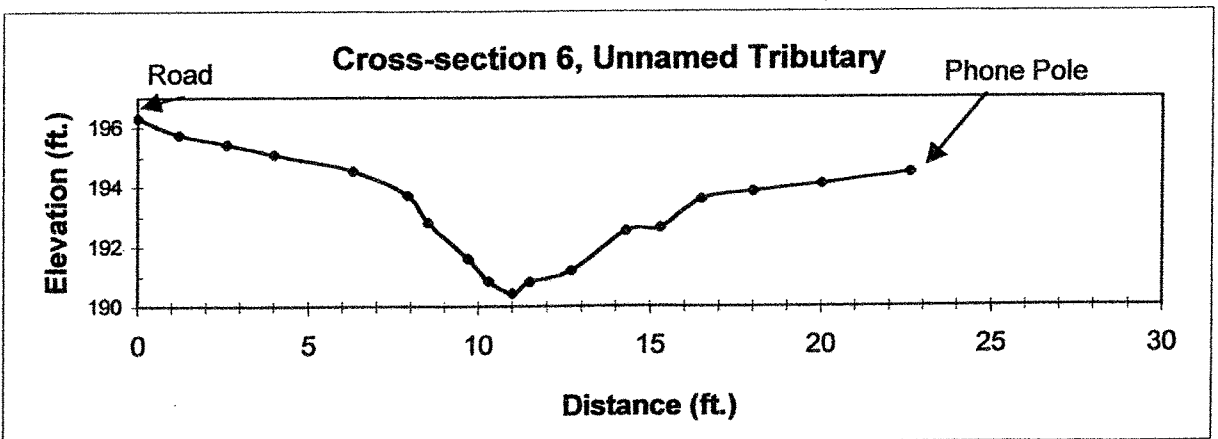
In reference area along road, in rose tangle at 1775 on LP



At 1400 on LP in pasture above multiflora rose thicket.



In pasture on LS of road across from trailer at 6+00 on the LP.



At top of tributary, section is on the second telephone pole down from the upper prop. Line. Runs from fence line to pole.

Longitudinal Profile Data Sheet for: Phillips Site, Middle Fork Creek.

Profile description: Longitudinal profile begins at the top of Phillips property at large sycamore and continues DS to head of riffle above ford.
Dr. Phillips owns both sides from 650 to 1550.

Station	HI	Length	Tot. Dist.	Thal.	Thal. Elev	slope	W.S.	W.S. elev.	slope	BF	BF Elev.	slope	Top bank	T.B. elev.	slope
Riffle	108.36	0	181	11.38	96.98	0.01	10.33	98.03	0.0110	7.84	100.52	0.0089	6	102.36	0.0097
Pool	108.1	181	40	11.46	94.64	-0.01	10.06	96.04	-0.0035	7.38	98.72	-0.0065	5.5	100.6	0.0015
Pool	106.1	221	26	12.12	93.98	-0.04	9.89	96.21	0.0012	7.54	98.56	-0.0023	5.55	100.55	0.0004
Riffle	106.1	247	129	11.18	94.92	0.01	9.92	96.18	0.0085	7.12	98.98	0.0071	5.56	100.54	0.0056
Pool	104.22	376	15	10.66	93.56	-0.06	9.14	95.08	-0.0033	6.53	97.69	-0.0193	4.4	99.82	0.0713
Pool	104.22	391	58	12.35	91.87	-0.04	9.1	95.12	-0.0002	6.6	97.62	-0.0062	4.4	99.82	0.0184
Riffle	104.22	449	88	9.82	94.4	0.02	9.09	95.13	0.0114	6.24	97.98	0.0163	5.47	98.75	-0.0052
Pool	103.86	537	28	11.08	92.78	-0.01	9.73	94.13	0.0007	7.31	96.55	0.0025	4.65	99.21	0.0125
Riffle	103.86	565	49	10.73	93.13	0.03	9.75	94.11	0.0139	7.38	96.48	0.0106	5	98.86	0.0024
Pool	103.86	614	11	12.21	91.65	-0.05	10.43	93.43	0.0164	7.9	95.96	-0.0064	5.12	98.74	0.0445
Pool	103.86	625	25	12.62	91.24	-0.04	10.43	93.43	0.0072	7.9	95.96	-0.0028	5.12	98.74	0.0196
Riffle	103.86	650	48	11.61	92.25	0.02	10.61	93.25	0.0065	7.83	96.03	-0.0021	5.61	98.25	0.0060
Pool	103.86	698	130	12.62	91.24	-0.01	10.92	92.94	0.0017	7.73	96.13	0.0035	5.9	97.96	0.0084
Riffle	103.29	828	48	11.33	91.96	0.03	10.57	92.72	0.0148	7.62	95.67	0.0169	6.42	96.87	0.0215
Pool	103.29	876	24	12.76	90.53	-0.04	11.28	92.01	0.0054	8.43	94.86	0.0138	7.45	95.84	-0.0375
Pool	103.29	900	39	13.05	90.24	-0.03	11.28	92.01	0.0033	8.43	94.86	0.0085	7.45	95.84	-0.0231
Riffle	103.29	939	231	11.89	91.4	0.02	11.41	91.88	0.0161	8.76	94.53	0.0144	6.55	96.74	0.0139
Riffle	101.18	1170	94	11.86	89.32	0.02	11.23	89.95	0.0106	8.61	92.57	0.0079	5.35	95.83	0.0190
Riffle	101.18	1264	96	13.27	87.91	0.92	12.23	88.95	0.9266	9.35	91.83	0.0066	7.14	94.04	0.9796
Pool	101.18	1360	123	14.09	87.09	0.00	13.03	88.15	-0.0005	9.98	91.2	0.0004	2.81	93.52	0.0000
Riffle	96.33	1483		8.96	87.37	#DIV/0!	8.12	88.21	#DIV/0!	5.18	91.15	#DIV/0!	2.81	93.52	#DIV/0!
AVERAGE						0.0395		0.0552		0.0038		0.0615			
AVERAGE pool slope						-0.0249		0.0024		-0.0017		0.0144			
Average riffle slope						0.0202		0.0117		0.0104		0.0077			
Total Pool length 519			35%	Total Riffle length 964			65%	1483 =TOTAL							

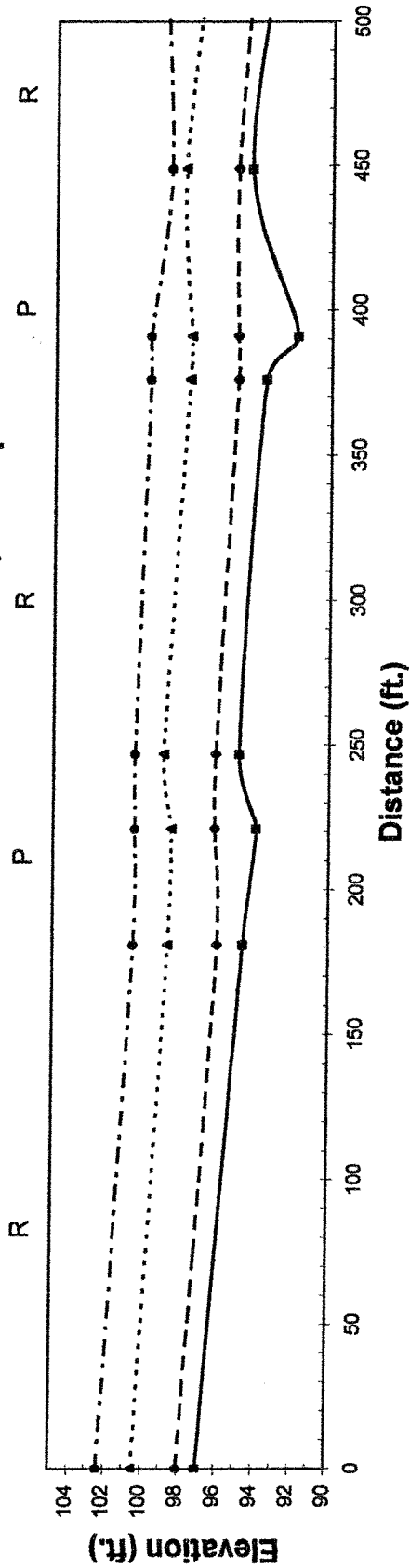
Water surface slope from head of 1st riffle to bottom of last pool
 distance = 1483
 top = 98.03
 bottom = 88.21
 9.82 difference from top to bottom of the valley
 Water Surface Slope = 0.0066

Valley slope from head of 1st top of bank to last
 distance = 1483
 1st top of bank = 102.36
 last top of bank = 93.52
 8.84 difference from top to bottom of the valley
 Valley Slope = 0.0060

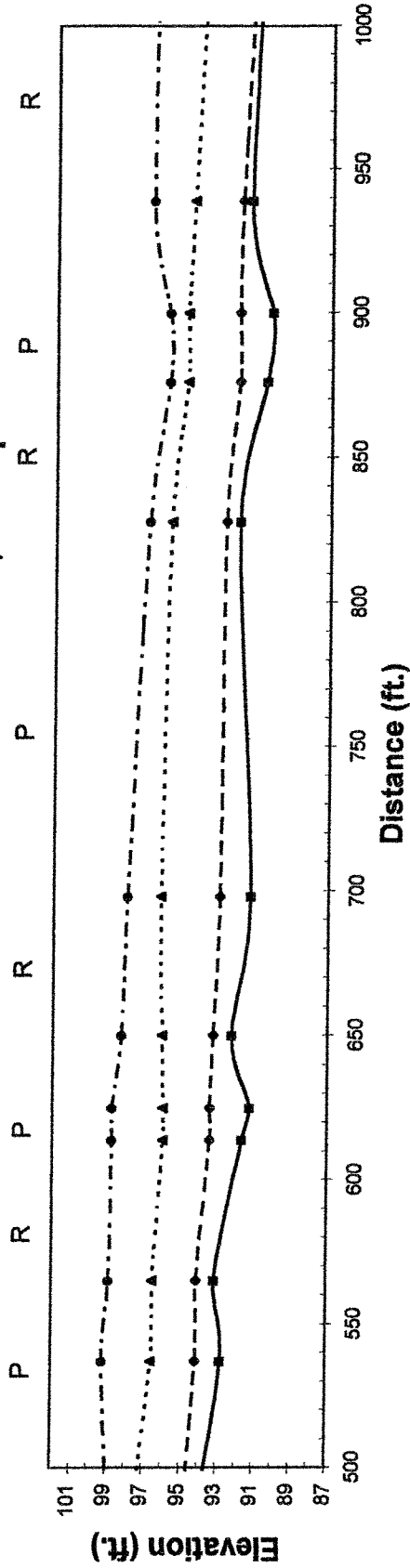
	Dbkf		RIFFLA-POOL			TB-Thal	Bkf-W.S.
	pool	riffle	pool-L	riffle-L	R:P		
Riffle		3.54		181	2.7	5.38	
Pool			66			5.96	2.68
DP	4.58					6.57	2.35
Riffle		4.06		129	1.8	5.62	2.8
Pool			73			6.26	2.61
DP	5.75					7.95	2.5
Riffle		3.58		88	3.1	4.35	2.85
Pool			28			6.43	2.42
Riffle		3.35		49	1.4	5.73	2.37
Pool			36			7.09	2.53
DP	4.72					7.5	2.53
Riffle		3.78		48	0.4	6	2.78
Pool			130			6.72	3.19
Riffle		3.71		48	0.8	4.91	2.95
Pool			63			5.31	2.85
DP	4.62					5.6	2.85
Riffle		3.13		421	3.4	5.34	2.65
Riffle		3.25				6.51	2.62
Riffle	3.92	3.92				6.13	2.88
Pool			123				
Riffle		3.78					
AVG.	4.7	3.6	66.0	137.7	1.9	6.1	2.7
Minimum	3.92	3.13	28	48	0.37	4.35	2.35
Maximum	5.75	4.06	130	421	3.42	7.95	3.19

Longitudinal Profile Information

Longitudinal Profile of Middle Fork Creek, Phillips Site

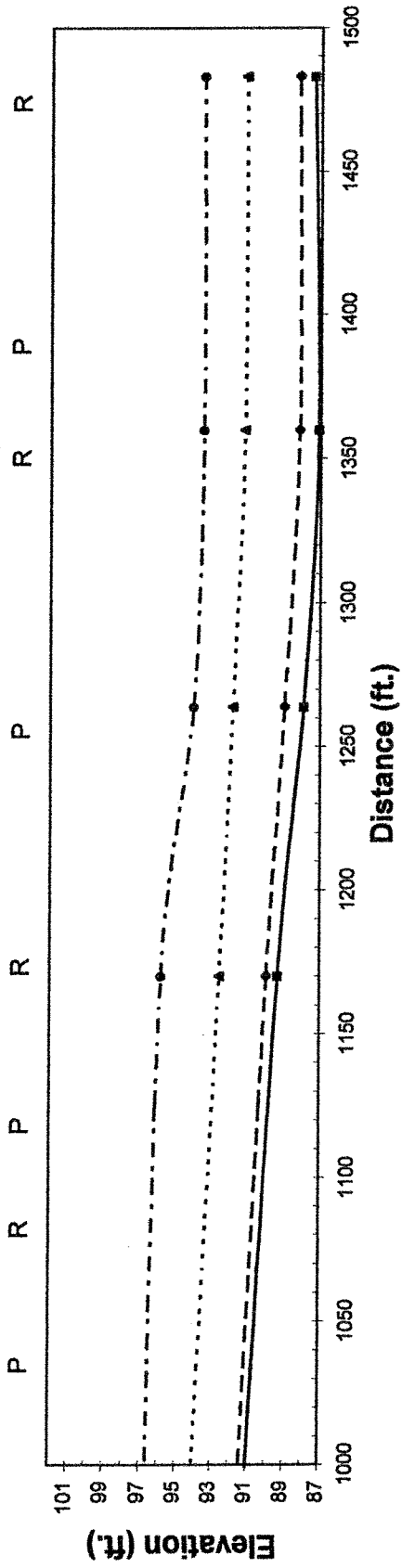


Longitudinal Profile of Middle Fork Creek, Phillips Site



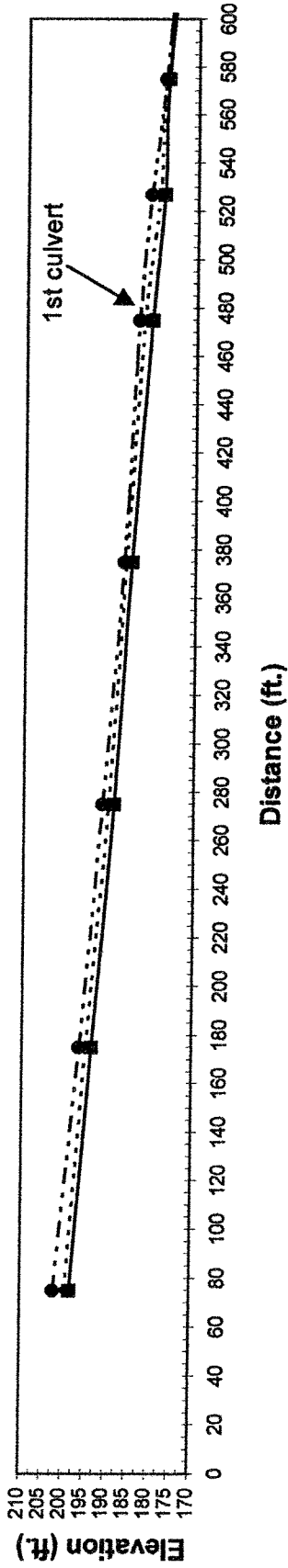
- Thalweg elevation
- ◆ Water Surface elevation
- ▲ Bankfull elevation
- Top of Bank elevation

Longitudinal Profile of Middle Fork Creek, Phillips Site

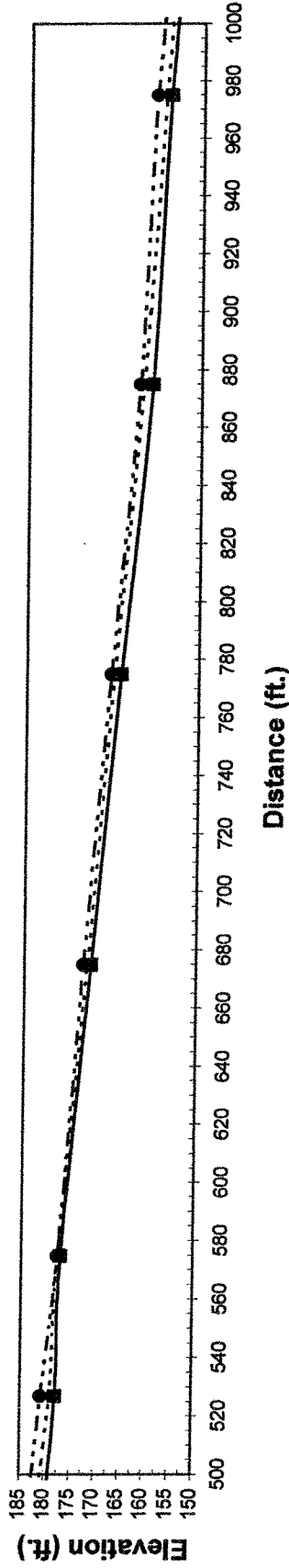


- Thalweg elevation
- ◆ Water Surface elevation
- ▲ Bankfull elevation
- Top of Bank elevation

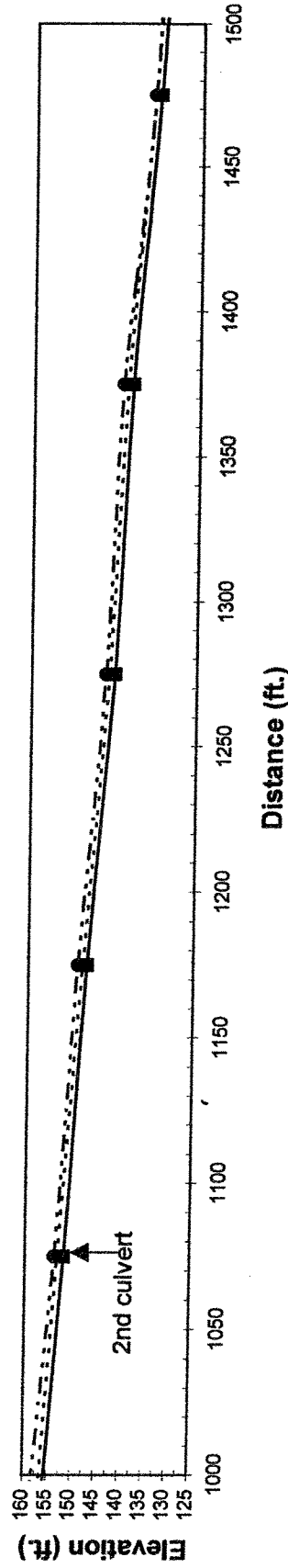
Longitudinal Profile of tributary at Phillips Site



Longitudinal Profile of tributary at Phillips Site

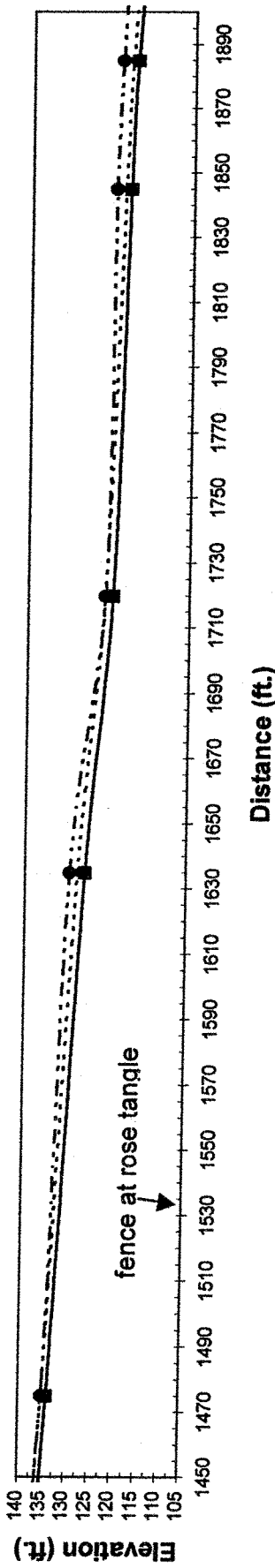


Longitudinal Profile of tributary at Phillips Site

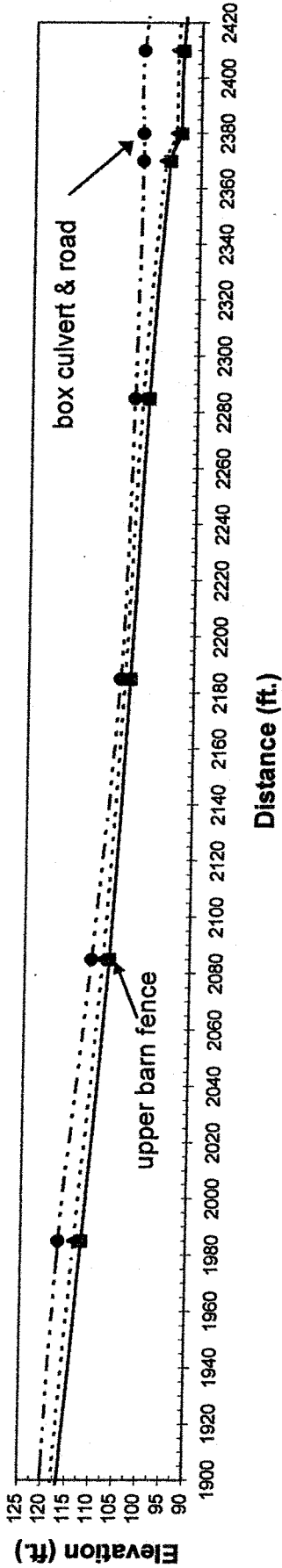


- Thalweg elevation
- ◆ Water Surface elevation
- ▲ Bankfull elevation
- Top of Bank elevation

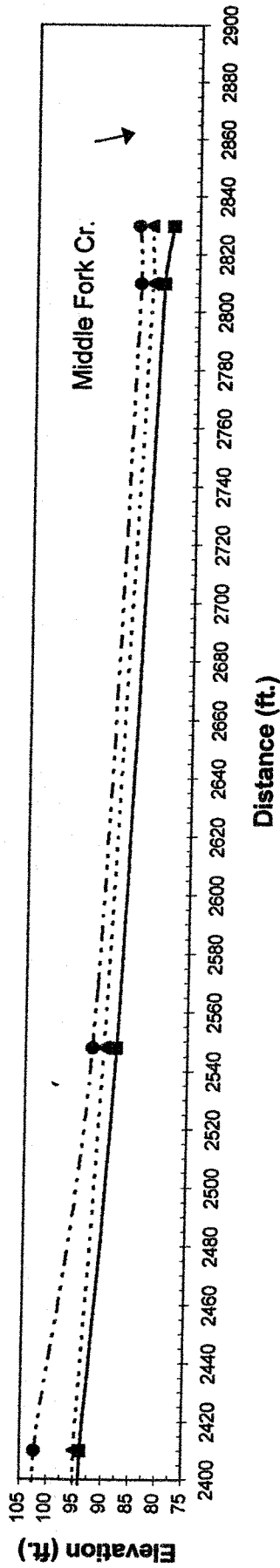
Longitudinal Profile of tributary at Phillips Site



Longitudinal Profile of tributary at Phillips Site



Longitudinal Profile of tributary at Phillips Site



PEBBLE COUNT INFORMATION

PEBBLE COUNT											
Middle Fork Creek - Phillips site					Date: 9/23/99						
Site:		Party:		Reach: combined		Reach: Riffle		Reach: Pool			
PARTICLE	MILLIMETER	PARTICLE COUNT	TOT #	ITEM %	% CUM	TOT #	ITEM %	% CUM	TOT #	ITEM %	% CUM
Silt/Clay	< .062	0.062 S/C	7	6.2%	6%	3	4%	4%	4	9%	9%
Very Fine	.062 - .125	S	10	8.8%	15%	6	9%	13%	4	9%	18%
Fine	.125 - .25	A	5	4.4%	19%	3	4%	17%	2	5%	23%
Medium	.25 - .50	N	3	2.7%	22%	1	1%	19%	2	5%	27%
Coarse	.50 - 1.0	D	3	2.7%	25%	1	1%	20%	2	5%	32%
Very Coarse	1 - 2	S	2	1.8%	27%	1	1%	22%	1	2%	34%
Very Fine	2 - 4		0	0.0%	27%	0	0%	22%	0	0%	34%
Fine	4 - 5.7	G	1	0.9%	27%	0	0%	22%	1	2%	36%
Fine	5.7 - 8	R	4	3.5%	31%	3	4%	26%	1	2%	39%
Medium	8 - 11.3	A	3	2.7%	34%	1	1%	28%	2	5%	43%
Medium	11.3 - 16	V	8	7.1%	41%	5	7%	35%	3	7%	50%
Coarse	16 - 22.6	E	4	3.5%	44%	2	3%	38%	2	5%	55%
Coarse	22.6 - 32	L	7	6.2%	50%	4	6%	43%	3	7%	61%
Very Coarse	32 - 45	S	13	11.5%	62%	10	14%	58%	3	7%	68%
Very Coarse	45 - 64		5	4.4%	66%	4	6%	64%	1	2%	70%
Small	64 - 90	C	13	11.5%	78%	9	13%	77%	4	9%	80%
Small	90 - 128	O	7	6.2%	84%	4	6%	83%	3	7%	86%
Large	128 - 180	B	8	7.1%	91%	6	9%	91%	2	5%	91%
Large	180 - 256	L	2	1.8%	93%	2	3%	94%	0	0%	91%
Small	256 - 362	B	1	0.9%	94%	1	1%	96%	0	0%	91%
Small	362 - 512	L	0	0.0%	94%	0	0%	96%	0	0%	91%
Medium	512 - 1024	D	0	0.0%	94%	0	0%	96%	0	0%	91%
Lrg-Vry Lrg	1024 - 2048	R	0	0.0%	94%	0	0%	96%	0	0%	91%
Bedrock	10000	BEDROCK	7	6.2%	100%	3	4%	100%	4	9%	100%
			TOTALS:		113			69			44

PEBBLE COUNT INFORMATION

