As Built Report for the Wild Mitigation Site, Obids Creek, Ashe County

NCDOT/NCWRC Stream Mitigation Program

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North Carolina Wildlife Resources Commission
Habitat Conservation Program

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Contents

INTRODUCTION

This as-built plan is submitted as partial fulfillment of the off-site stream mitigation agreement between the North Carolina Department of Transportation (DOT) and North Carolina Wildlife Resources Commission (WRC) for the R-529 US 421 road improvement project in Watuaga County. Under this agreement, a total of 14,814 linear feet of stream mitigation is required by the United States Army Corps of Engineers (COE) and 7,407 linear feet of mitigation for the North Carolina Division of Water Quality (DWQ). The purpose of this report plan is to summarize those practices used for bank stabilization and habitat enhancement along 1819 linear feet of Obids Creek located on the Wild property, Ashe County.

PRECONSTRUCTION SITE CONDITIONS

Obids Creek is a tributary to the South Fork New River in the New River drainage, Ashe County (Figure 1). The watershed area at the Wild site is 3.5 square miles. Land use consists of small rural farms containing pastures and forested wood lots. Most of the flatter valleys are used to raise crops and graze livestock. Some livestock grazing also occurs on steep slopes. Much of the forestland in the watershed has been converted to agricultural land, with a good section used for Christmas tree farming. However, a significant amount of the watershed remains in secondary growth forest. There is some conversion of agricultural land to single family home sites. Obids Creek suffers from past and ongoing land disturbing activities within the watershed. Streambank instability from poor riparian zone management has continued for many years, causing adverse water quality impacts through increased sedimentation.

Obids Creek flows through an alluvial valley (Valley Type VIII) with soils in the Toxaway series. Toxaway soils consist of poorly drained and very poorly drained soils on flood plains. These soils formed in loamy alluvium deposits. Slopes range from 0 to 0.2 percent. Toxaway soils have loamy horizons 40 to 60 inches thick and are strongly acidic or semiacidic, except where the surface layer has been limed.

At the Wild site, the riparian zone, though narrow (less than 10 feet, each bank), is fairly intact along many sections of the stream. Vegetation along this narrow riparian zone consists primarily of tag alder (*Alnus serrulata*) and multiflora rose (*Rosa multiflora*) along with some silky dogwood (*Cornus amomum*), red maple (*Acer rubrum*) and black cherry (*Prunus serotina*). Livestock grazing resulted in loss of riparian vegetation and severe bank erosion at numerous locations within the riparian zone. Fish cover was limited to a few undercut banks, a few deep pools, and a limited amount of small woody debris. The combination of these factors provides fair habitat for aquatic species.

A major tributary is located at station 2+77 and smaller spring seeps are located at stations 4+16 and 6+69. There is an existing ford at station 16+13 to 16+28 which is used for farm equipment access to pastures on the west side of Obids Creek. An abandoned stream channel is located from station 12+00 to 14+19. This abandoned channel is the result of an old beaver dam or past channelization project.

Eroding stream banks were in need of bank stabilization/enhancement work to restore the stream corridor to a more stable condition. The following major bank erosion areas were noted during the preconstruction survey:

Station #	Site condition
3+12 - 3+42	eroding left bank
3+91 - 4+26	eroding left bank/debris jam
5+60 - 6+00	eroding right bank
6+30 - 6+65	eroding right bank
7+75 - 8+50	eroding left bank
8+65 - 9+60	eroding right bank
10+64 - 11+30	eroding left bank
11+94 - 14+06	eroding left bank
14+20 - 14+30	eroding right bank

In addition to the above sites, there are many small bank erosion locations that are the result of cattle access. Excluding livestock from the stream riparian zone will allow these areas to heal naturally.

On the Wild property the stream was composed of 79% riffles and 21% pools. Bankfull was determined using field-identified indicators, primarily a scour line and point bar height, and evaluated using regional curve information (NCSU-Stream Restoration Institute). Bankfull was difficult to determine at many locations because livestock had destroyed most indicators. Course to very course gravel is the bed material in the reach (D50 = 30 mm) and cross-section (D50 = 45mm). The weighted D50 and D 84 is 35 mm and 103 mm, respectively. Sinuosity is 1.33, water surface slope 0.011 ft, valley slope 0.0135 ft, entrenchment ratios were 4.3 -5.7 and width/depth ratios were 14.2 -25.2. Based on sinuosity, entrenchment ratio, width/depth ratio, water surface slope and streambed materials, the stream is classified as a C4 stream type.

PROJECT OBJECTIVES

The objectives of the Obids Creek stream enhancement project on the Wild property were as follows:

1. Slope the banks at selected locations to reestablish a bankfull bench to make the banks more resistant to erosion and flooding.
2. Install rootwads and/or rock vanes or rock weirs where appropriate to provide long-term bank stability, fish habitat, and to narrow and deepen the stream channel.
3. Plant native trees, shrubs and ground cover on all disturbed banks and along the channel to provide long term bank stability, stream shading, cover and food for wildlife.
4. Exclude livestock from the riparian zone through fencing and alternate water sources as specified in the plan developed by the Natural Resource Conservation Service. A 25-foot wide riparian buffer zone is recommended along each bank.
5. Treat multiflora rose (*Rosa multiflora*) with a one-time herbicide application provided by this program with follow-up treatments by the landowner, as needed to eliminate or control this exotic plant.

SITE IMPROVEMENTS

Conservation Easement

In order to ensure long term protection of the site, a conservation easement (CE) was signed by the landowner on September 20, 2002. The average width of the CE is approximately 66 feet wide (ranges from 50 to 85 feet) and encompasses 2.6 acres. Right-of-way access to the easement by WRC personnel will be from SR 1003, Idlewild Road, at the southwestern end of the project. The CE area is shown as CE No. 1, CE No. 2 and CE No. 3 of Parcel #703WM of Jonathan F. and Hollis M. H. Wild, being more particularly shown and described on a plat entitled Survey of CE and being recorded in Plat Book 006 Page 093 of the Ashe County Registry. The CE is perpetual and will be held by the WRC. **Copies of the CE and survey plat have been attached to this report for DWQ, COE and DOT files.**

Channel Modifications

Construction was carried out through an informal contract with A&E Construction. The contractor provided a dump truck and trackhoe with hydraulic thumb. Access to the site was through a temporary construction access from SR 1003, Idlewild Road, across the Wild's property to the site. Work began on September 6, 2002 by hauling large field rock collected from a pasture to the site. In-stream work began on September 10 and was completed on September 23, 2002.

Location of enhancement structures (rock and log vanes, rock weirs, root wads, bank sloping) are summarized in Table 1. At several locations a bankfull bench was constructed to eliminate vertical, eroding banks and reduce near bank stress. This did not involve filling the existing creek, but rather moving the slope of the streambank back away from the water for approximately 3 to 5 feet. Above this bankfull bench the streambank was sloped to the top of the bank and vegetated. As banks were sloped, sod mats salvaged from the site were used to stabilize the new banks. In some areas a blanket of erosion control fabric was installed to provide temporary bank protection until vegetation could be established. Rock weirs and rock vanes were installed to prevent stream head cutting, bank erosion and create pool habitat. Large footer rocks support top boulders in the weirs and vanes. Holes were dug below the weir apex to accelerate and maintain pool formation by stream water velocities. Excess streambed materials were excavated at rock weirs and rock vanes and placed upstream of the structure near the bank where natural deposition would be expected. Rock vanes were used to divert water away from eroding banks and for habitat diversity. Root wads were used to improve bank stability, decrease width and improve aquatic habitat. At stations 10+56 and 16+30 stable ford crossings were constructed. A rock weir was built below each crossing to maintain long-term ford stability.

The post construction as-built survey was completed on January 9-10, 2003. Appendix 1contains the post-construction channel cross-sections, longitudinal profile, and pebble counts. Nine cross-sections will be used to monitor long-term channel stability. The post longitudinal profile shows how the project increased pool and deep-water habitat. Pool habitat was increased from 21% to 31%. The scour action of root wads, rock weirs, and rock and log vanes can be observed from the as-built profile. These structures are creating the desired deep-water aquatic habitat and sorting bed material in a way that will provide needed fish spawning gravel. The pre-construction and post construction D 50's were 35 mm and 31 mm (coarse gravel).

Appendix 2 contains before and after photos illustrating various stream enhancement methods used at the site. Methods pictured include bank sloping, rock vanes, rock weirs, root wads, stream crossings and fencing. It should be noted that some of the sites contain pictures taken just after a greater than bankfull event (6" rain) which occurred on Sept. 26-27, 2002, three days after the in-stream work was completed. No major damage occurred to

the project as a result of this flood. There was some minor bank scouring along some of the newly constructed banks and some up slope damage to the lower ford. These problems were quickly corrected. Considering the severity of this flood right after project completion, we were quite pleased with how well all the new structures functioned. Since the September 26-27, 2002 flood, another bankfull event occurred on February 22, 2003.

Riparian Improvements

During construction, sod mats salvaged from the site were used to provide instant bank stability and long term erosion control. Sod mats had the advantage of containing an established seed mix. On sites where sod mats were not used, the area was seeded with a WRC native riparian mix and cover crop of winter wheat and rye. After seeding, an eight-foot wide straw erosion control blanket was used to cover the soil. These blankets were used to stabilize the soil surface until a vegetative cover could be achieved and to contribute to soil stability after vegetation is established. As the straw blankets decompose over a 2-year period, permanent vegetation should be well established.

Table 2 summarizes live stake and tree plantings at the site. On November 13, 2002, fifty-five tag alder (*Alnus serrulata*) were planted at constructed bankfull bench sites. Live stakes and bare root nursery trees were planted on the 2.6 acre site during March 2003. A total of 487 live stakes consisting of silky dogwood (*Cornus amomum*), silky willow (*Salix sericea*), black willow (*Salix nigra*) and elberberry (*Sambucus cansdensis*) were planted. A total of 238 bare root trees purchased from the NC Forest Service and a commercial nursery included northern red oak (*Quercus rubra)*, white oak (*Quercus alba*), persimmon (*Diospyros virginiana*), sugarberry (*Celtis laevigata*), black walnut (*Juglans nigra*), and black locust (*Robina pseudoacacia L.*) were also planted. The site will be monitored to ensure that a good stand of trees/shrubs is established at the rate of 320 per acre after 5 years.

One of the objectives of the project was to do a one-time treatment of multiflora rose. While we did remove a lot of multiflora rose during construction and some was treated during tree planting, a good bit remains. Plans are to do a treatment of this invasive plant at a later date.

Livestock Exclusion

Mr. Glen Sullivan, Cost Share Technician, with the Ashe County Soil and Water Conservation District (ACSWCD) developed and supervised construction of the livestock exclusion plan for the site (Figure 3). In order for any stream restoration/enhancement project to be a success, livestock must be excluded from the recent construction and riparian zone and an alternate watering source other than the stream must be provided. This was accomplished by installation of one well, 2 pressure fed watering tanks, spring development and reservoir, 1 gravity fed watering tank, and approximately 3,400 feet of conservation easement boundary/riparian zone fencing. Two stable stream crossings consisting of underlying fabric geotextiles and gravel were also installed. Some final work needs to be completed on the livestock crossings and more gravel is needed at some sites on the access road.

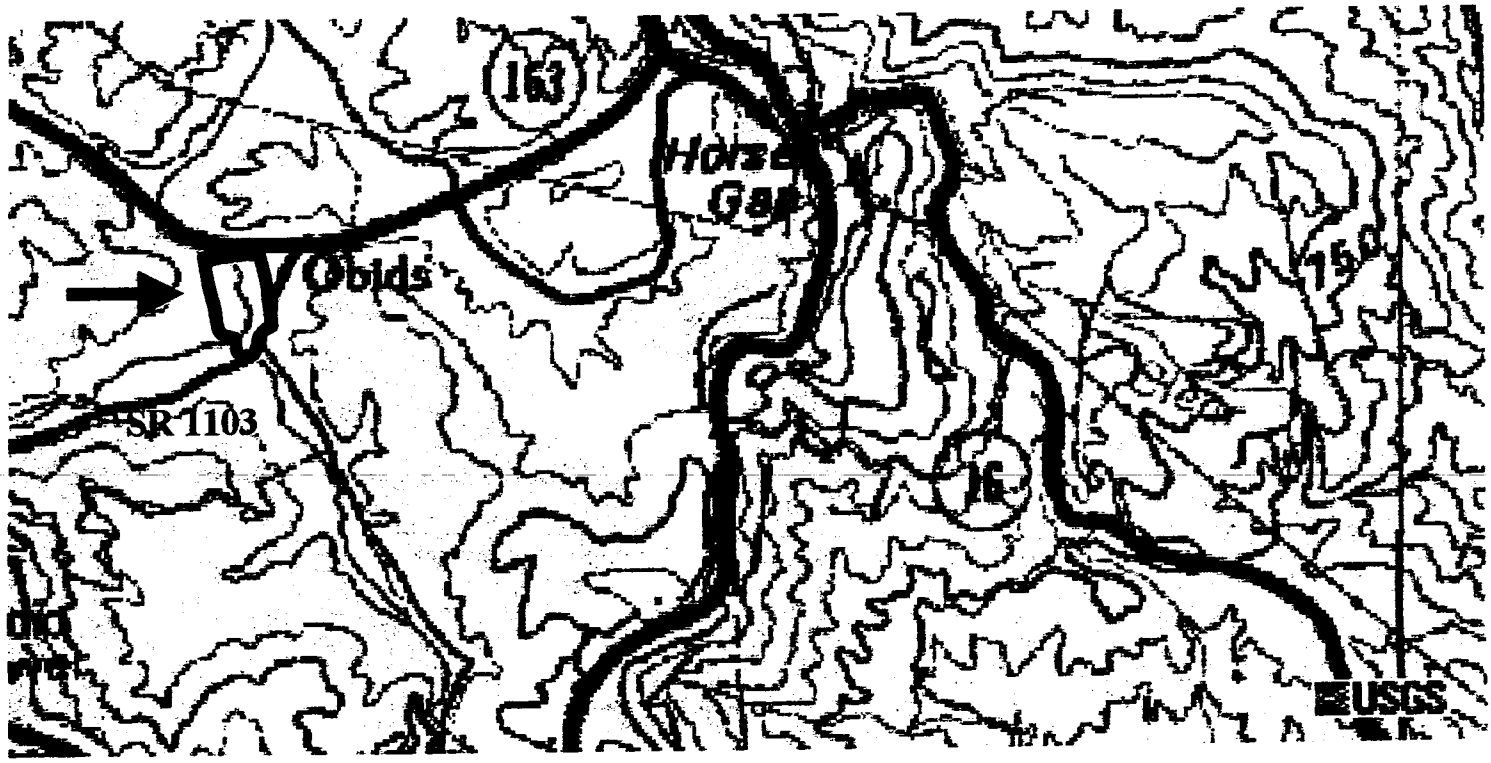
Project Costs

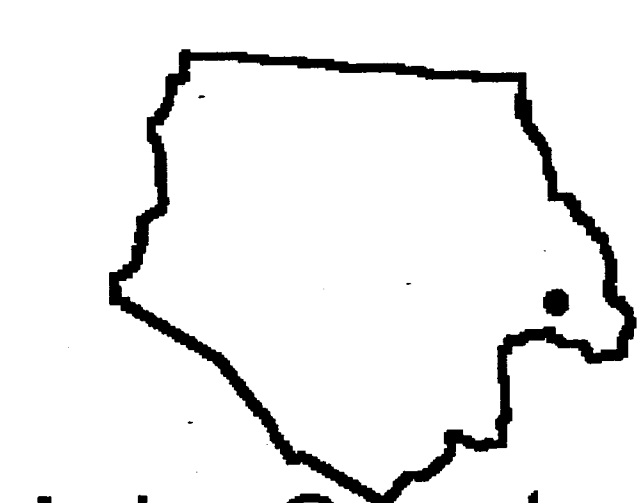
Project costs for the Wild site are summarized in Table 3 (current through April 1, 2003). Total WRC project cost for stream enhancement work is $60,763.97, or $33.66 per linear foot of stream enhancement (1819 lf). Project cost includes administrative cost; meetings with the landowner, NCDOT and NRCS personnel; field survey work; project conceptual; construction and as-built plans; tree purchase and planting; erosion control materials (seed, fertilizer, fabric); construction and livestock exclusion contracts; and WRC personnel costs. Not included in this total is multiflora rose plant control, which has not been completed yet and NRCS personnel time. Also not included in this cost summary is the final completion of access roads and fencing at stream crossings. This work has been delayed due to adverse weather conditions this winter. Future long term monitoring and any repair costs will be added to the total as needed during the five year monitoring periond (DWQ requirement). Taking into account NCDOT Location and Survey and Right of Way personnel expenses ($2,628.88) and CE costs ($13,000), the project total is $76,392.85 or $42.32 per foot.

CONCLUSION

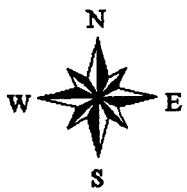
Through natural stream design, stream dimension and profile was improved at the Wild site. Water quality will be improved through reduced sedimentation from eroding banks and exclusion of livestock from the riparian zone. As the riparian zone matures, water temperatures should decrease, improving trout habitat. In-stream habitat for fish and aquatic invertebrates has been increased with the installation of rock weirs, rock and log vanes and root wads. Both aquatic and terrestrial species will benefit with the return of a functioning riparian corridor and stream aesthetics have been improved.

Figure 1. Wild Site on Obids Creek, Ashe County





Ashe County



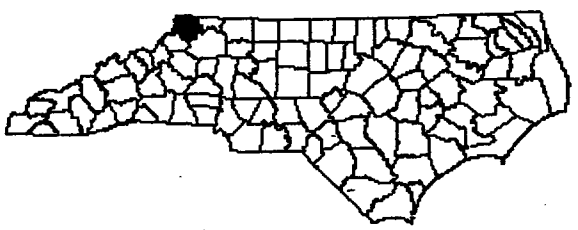
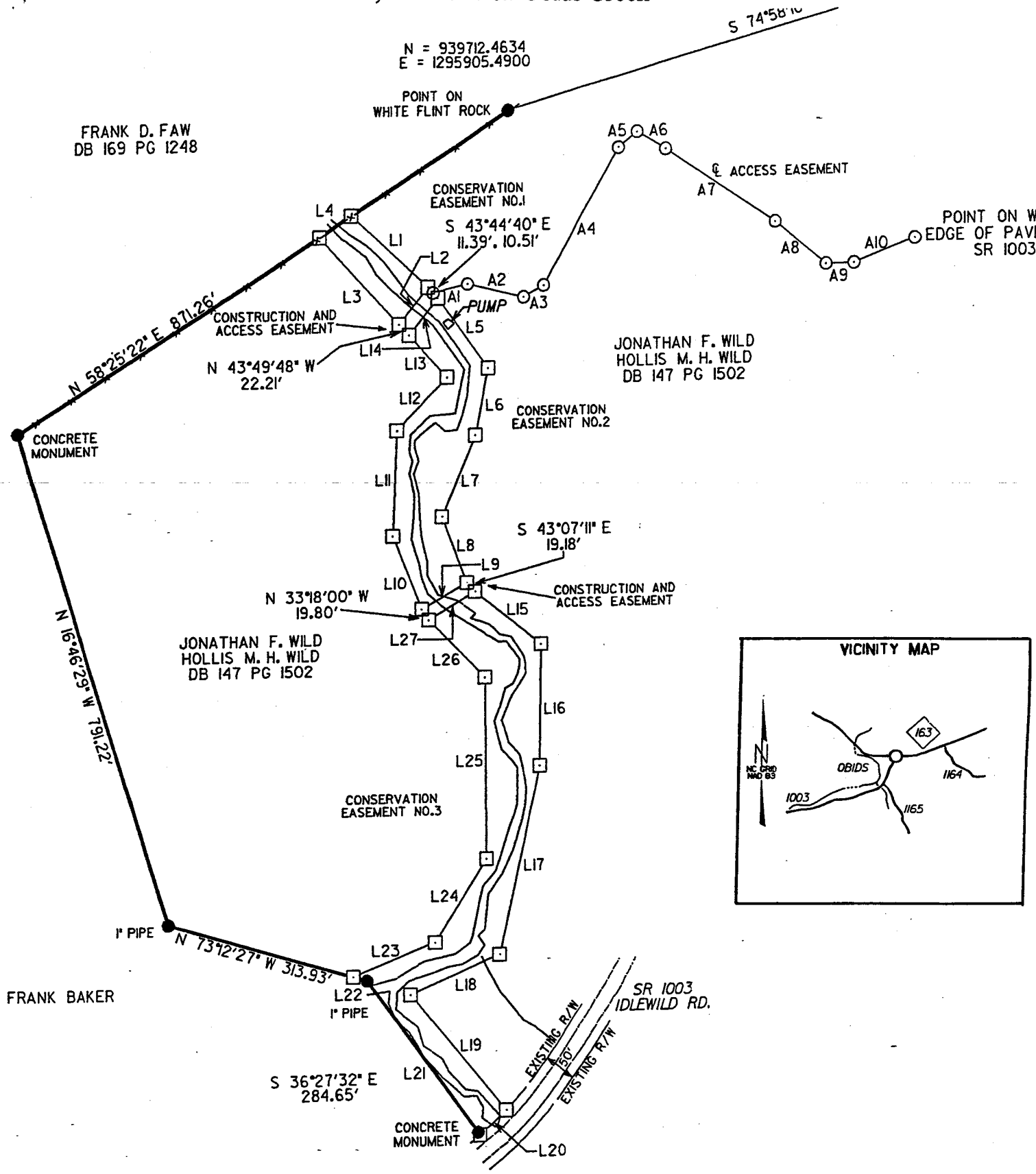


Figure 2:

Conservation Easement Plat, Wild Site on Obids Creek



SURVEY OF CONSERVATION EASEMENT ACQUIRED BY NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FOR NORTH CAROLINA WILDLIFE RESOURCE COMMISSION		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION LOCATION AND SURVEYS UNIT 723 MAIN STREET NORTH WILKESBORO, NC 28659 (336) 667-9186	
TOWNSHIP : OBIDS	COUNTY : ASHE	SURVEY DATE: 01-31-01	SURVEYED BY: R.G. MILLER
STATE : NORTH CAROLINA		SCALE : 1" = 200'	COMPUTED BY: R.G. MILLER
PIN NUMBER :		CHECKED BY: R.G. MILLER	DRAWN BY: C.S. MASTIN

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Figure 3: Livestock exclusion plan, Wild site, Obids Creek, Ashe Coounty

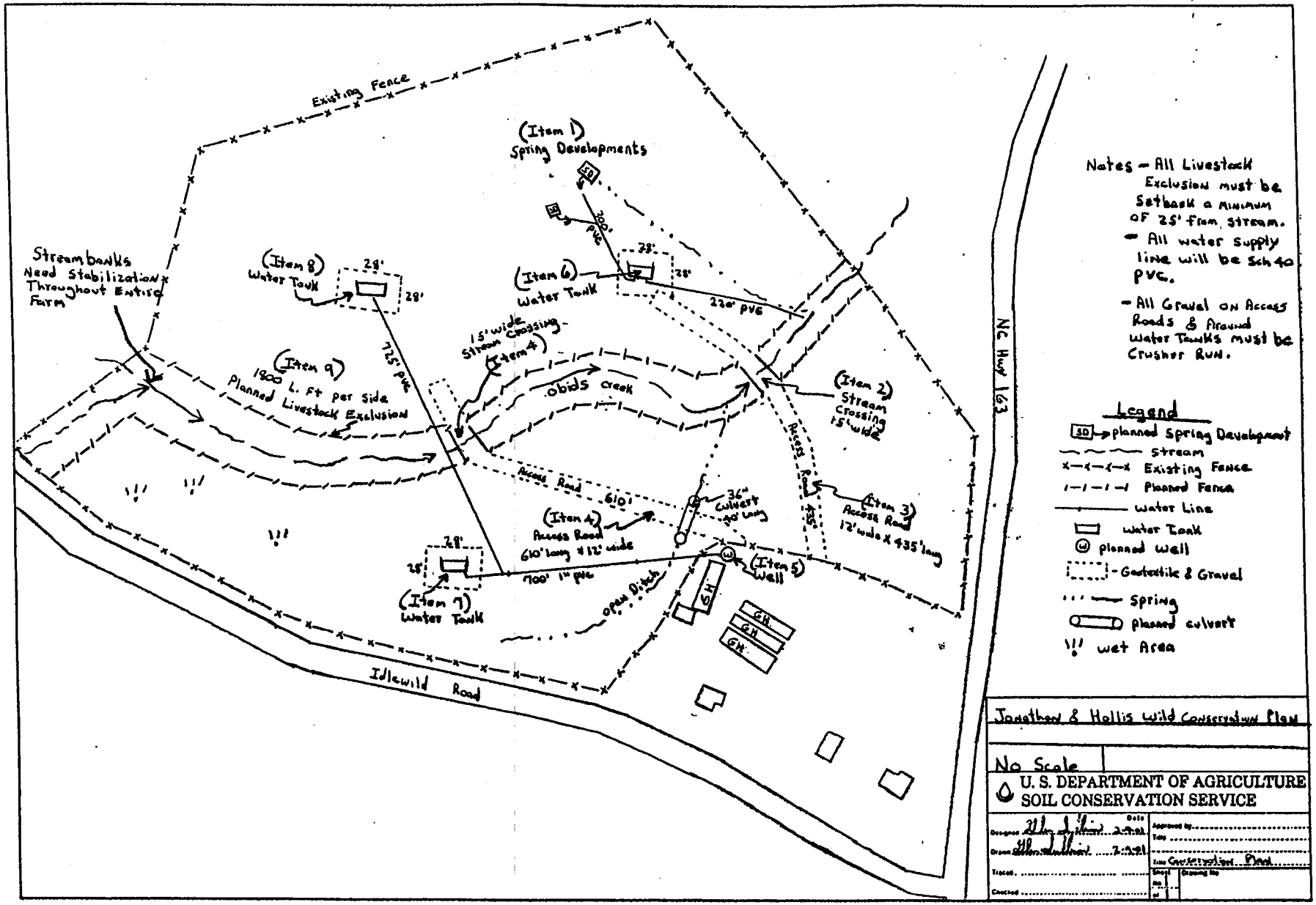


Table 1: Station number and type of stream improvement structure, Obids Creek, Wild Site, Ashe Co.

Station No.	Type of stream improvement
3+09	2 rock vanes, left and right banks
3+40	rock weir
5+44	rock vane, left bank
7+00-7+50	right bank sloping
7+04	rock vane, right bank
7+21	log vane, right bank
7+44	rock weir
7+75-8+55	left bank sloping and creation of bankfull bench
8+03	rock weir and root wads, left bank
8+65-9+60	right bank sloping and creation of bankfull bench
8+94	rock weir
9+00	root wads, left bank
9+22	log vane
9+46	rock weir
10+64-11+27	upper ford crossing
10+81-11+25	right bank sloping and creation of inner berm bench
10+81	rock weir to maintain ford grade
10+88	root wads, right bank
11+16	bank log, left bank
11+43	log vane, left bank
11+94-14+06	bank sloping, left bank
12+60	rock weir
12+67	root wads, left bank
13+64	root wads, left bank
14+00	rock vane and root wads, left bank
14+20-14+50	bank sloping, right bank
14+29	root wads and rock vane, right bank
14+81	rock vane, left bank
15+20-15+35	bank sloping, right bank
15+23	rock vane, right bank
16+30	lower ford crossing
16+44	rock weir to maintain ford grade
17+45-17+60	bank sloping, right bank
17+15	rock and log vanes, left and right banks
17+49	rock vane and root wads, right bank

Table 2: Live stakes and trees planted at the Wild Site, Obids Creek (planting dates - 11/02, 3/12&17/03)

Location & number

Station 9+00 area downstream to upper ford, right bank.

3 trees of each species	=	18
silky dogwood live stakes	=	53

Station 7+39 area, right bank.

2 trees of each species	=	12
silky dogwood live stakes	=	60

Station 8+19 area, left bank

3 tress of each species	=	18
silky dogwood live stakes	=	55

Upper ford to lower CE line, left bank

10 trees of each species	=	60
plus: black locust	=	15
black walnut	=	8
persimmon	=	5
sugarberry	=	5
silky dogwood live stakes	=	50
silky willow live stakes	=	130
elderberry live stakes	=	20
back willow live stakes	=	10

Upper ford to lower CE line, right bank

7 trees of each species	=	42
silky willow live stakes	=	70
elderberry live stakes	=	15
silky dogwood live stakes	=	15

Tree Summary

Tag Alder	=	55	(planted in fall, 11/02, along sloped banks)
White oak	=	25	
Northern Red oak	=	25	
Black walnut	=	33	
Black locust	=	40	
Persimmon	=	30	
Sugarberry	=	30	
	Total	**238**	

Live stake summary

Silky dogwood	=	233
Silky willow	=	200
Elderberry	=	35
Black willow	=	10
	Total	**478**

Table 3. Project Costs as of 04/01/2003 Wild Site

WRC Administration		
hours	$	211.84
mileage	$	67.26
WRC Pre-Planning		
hours	$	9,681.05
mileage	$	872.48
WRC Construction		
hours	$	5,215.29
mileage	$	1,094.02
WRC As-Built		
hours	$	1,575.39
mileage	$	100.32
WRC Tree Planting		
hours	$	537.66
mileage	$	79.42
WRC Monitoring		
hours	$	146.78
mileage	$	22.80
Construction Contract		$3,297.00
Construction Materials		$1,487.19
Livestock Exclusion Contract		$28,127.52
NRCS Administrative Cost		$0.00
Tree Purchase		$100.00
WRC Overall 421 Project Administration		
hours	$	4,832.24
mileage		$384.36
project equipment / office expenses / supplies		$2,931.35
Total Project Cost as of		$60,763.97
WRC Cost per foot (1805ft)		$33.66
DOT Easement Payment		$13,000.00
DOT Location and Survey		$2,628.88
Overall Project Cost		$76,392.85
Overall Cost per foot		$42.32

Appendix 1

As-Built Survey Data
Wild Site, Obids Creek

Longitudinal Profile
Cross-sections
Pebble Counts

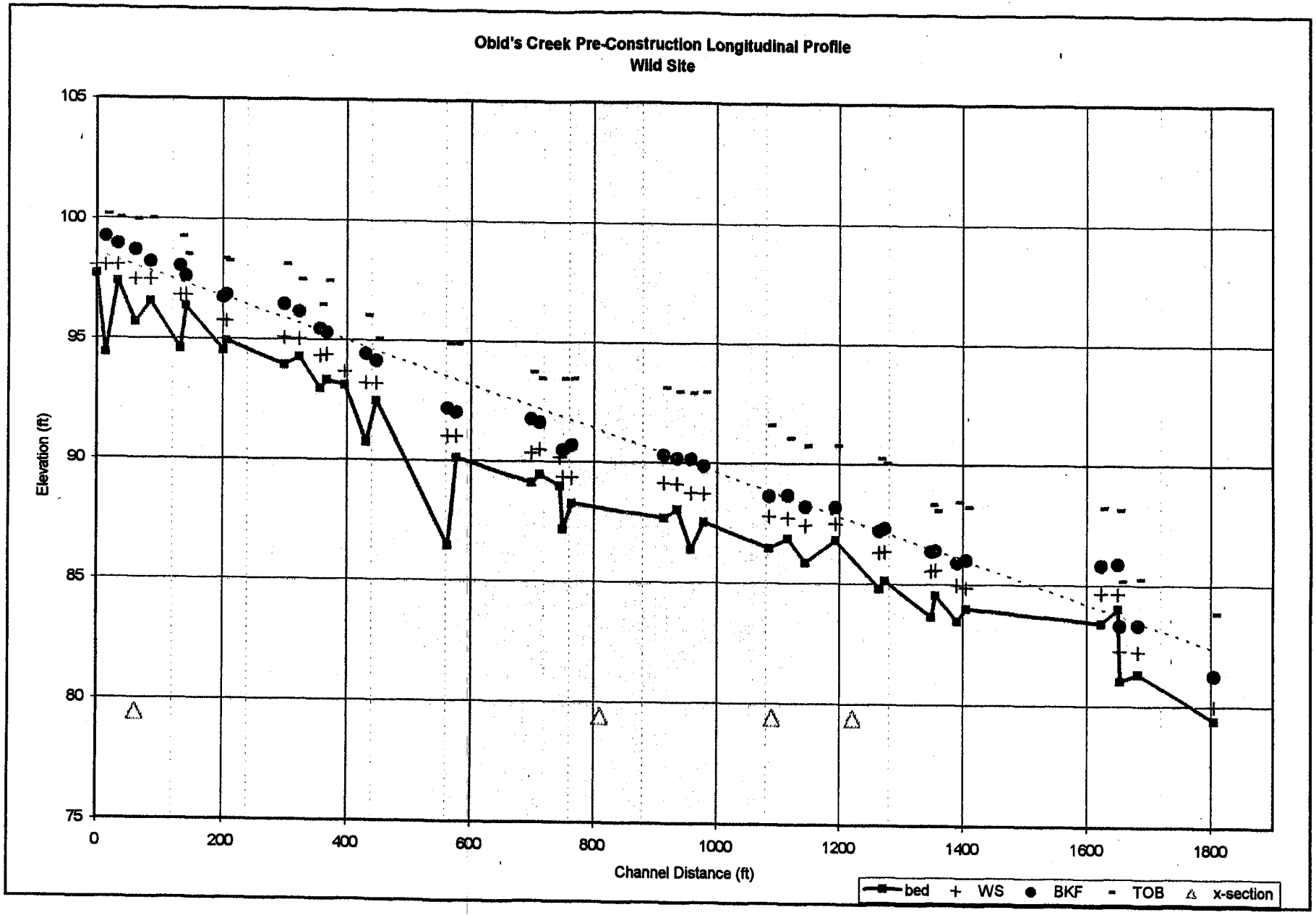
Stream:	Obid's Creek
Watershed:	South Fork New River
Location:	—
Latitude:	—
Longitude:	—
County:	Ashe County
Date:	1/9-1/10/03
Observers:	JM, SS
Channel Type:	C4
Drainage Area (sq mi):	3.5

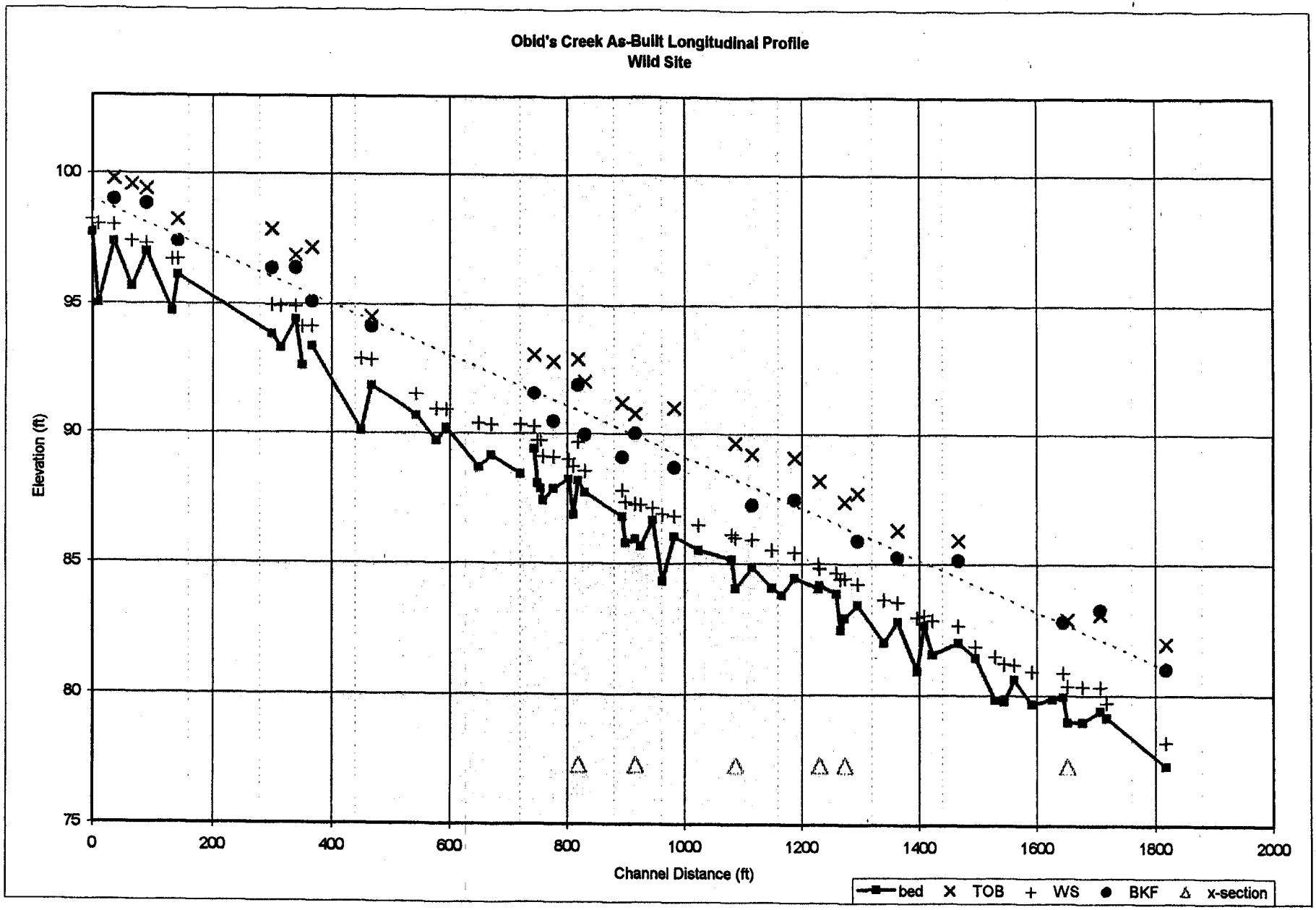
Pattern

	typical	min	max
bankfull width (ft)	37		
meander length (ft)			
belt width (ft)			
amplitude (ft)			
radius (ft)			
arc angle (degrees)			
straight length (ft)			
stream length	1819		
valley length	1361		
Sinuosity	1.34		
Meander Width Ratio	—	—	—
Amplitude Ratio	—	—	—
Meander Length Ratio	—	—	—
Straight Length Ratio	—	—	—
Radius Ratio	—	—	—

Profile

	typical	min	max
bankfull width (ft)	37		
pool-pool spacing (ft)	80	36	200
riffle length (ft)	60	11	182
pool length (ft)	30	9	94
run length (ft)			
glide length (ft)			
channel slope (%)	1.1		
riffle slope (%)	2	1	7.7
pool slope (%)	0.2	0.1	9
run slope (%)			
glide slope (%)			
measured valley slope (%)			
valley slope (%)	1.5		
Riffle Length Ratio	1.6	0.3	4.9
Pool Length Ratio	0.8	0.2	2.5
Run Length Ratio	—	—	—
Glide Length Ratio	—	—	—
Riffle Slope Ratio	1.8	0.9	7.0
Pool Slope Ratio	0.2	0.1	8.2
Run Slope Ratio	—	—	—
Glide Slope Ratio	—	—	—
Pool Spacing Ratio	2.2	1.0	5.4


Obid's Creek Pre-Construction Longitudinal Profile
Wild Site
Elevation (ft)
105
100
95
90
85
80
75
0
200
400
600
800
1000
1200
1400
1600
1800
Channel Distance (ft)
bed
WS
BKF
TOB
x-section


Obid's Creek As-Built Longitudinal Profile
Wild Site
Elevation (ft)
100
95
90
85
80
75
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Channel Distance (ft)
bed
TOB
WS
BKF
x-section

Wild As-built Long. Profile				100	Elevation BM												
notes	cross section	station	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS WS	FS	AZ azimuth	ELEV bed	ELEV water srf	ELEV BKF	ELEV TOB	ELEV WS
			2.81	102.81													
bottom of culvert		0		102.81		5.06				4.97			97.75				98.24
HOP		10		102.81		7.79				4.78			95.02				98.03
HOR		36		102.81		5.42		3.8	3.01	4.8			97.39		99.01	99.8	98.01
HOP		66		102.81		7.14			3.22	5.4			95.67			99.59	97.41
HOR		90		102.81		5.8		3.95	3.4	5.5			97.01		98.86	99.41	97.31
		117		102.81													
HOP		133		102.81		8.1				6.1			94.71				96.71
HOR		142		102.81		6.7		5.4	4.58	5.08			96.11		97.41	98.23	96.73
		300		102.81		8.95		6.42	4.94	7.82			93.86		96.39	97.87	94.99
HOP		315		102.81		9.49				7.88			93.32				94.93
				102.81	5.68												
			3.98	101.11													
HOR		340		101.11		6.67		4.73	4.24	5.19			94.44		96.38	96.87	94.92
HOP		351		101.11		8.47				6.97			92.64				94.14
	1	355		101.11		9.95			6	8.58							
HOR		368		101.11		7.72		5.99	3.94	5.95			93.39		95.12	97.17	94.16
HOP		450		101.11		11.01				8.2			90.1				92.91
HOR		468		101.11		9.22		6.95	6.57	8.24			91.89		94.16	94.54	92.87
		544		101.11		10.43				9.59			90.68				91.52
		578		101.11		11.4				10.18			89.71				90.93
		585		101.11		10.9				10.19			90.21				90.92
				101.11	6.25												
			3.3	98.16													
HOP		650		98.16		9.47				7.78			88.69				90.38
		671		98.16		9				7.81			89.16				90.35
		704		98.16													
		721		98.16		9.71				7.81			88.45				90.35
	2	736		98.16		9.65		6.54	5.41	7.86							
HOR		744		98.16		8.75		6.57	5.07	7.89			89.41		91.59	93.09	90.27
		750		98.16		10.07				8.43			88.09				89.73
		755		98.16		10.28				8.41			87.88				89.75
HOP		759		98.16		10.74				9.04			87.42				89.12
HOR		777		98.16		10.28		7.67	5.35	9.05			87.88		90.49	92.81	89.11
		803		98.16		9.9				9.14			88.26				89.02
		811		98.16		11.28				9.43			86.88				88.73
HOP	3	819		98.16		9.96		6.24	5.25	8.47			88.2		91.92	92.91	89.69
HOR		831		98.16		10.43		8.2	6.11	9.6			87.73		89.96	92.05	88.56
		850		98.16													
		877		98.16													
HOR		894		98.16		11.34		9.06	6.98	10.34			86.82		89.1	91.18	87.82
				98.16	7.44												
			6.34	97.06													
HOP		900		97.06		11.25				9.69			85.81				87.37
		914		97.06													
	4	916		97.06		11.12		7.04	6.28	9.78			85.94		90.02	90.78	87.28
		922.5		97.06													
		926		97.06		11.39				9.8			85.67				87.26
HOR		946		97.06		10.39				9.92			86.67				87.14
HOP		963		97.06		12.74				10.15			84.32				86.91
HOR		983		97.06		11.02		8.35	6.05	10.23			86.04		88.71	91.01	86.83
		1025		97.06		11.56				10.58			85.5				86.48
		1056		97.06													
		1081		97.06		11.89				10.94			85.17				86.12
HOP	5	1088		97.06		13.01			7.42	11.07			84.05			89.64	85.99
HOR		1116		97.06		12.2		9.8	7.85	11.15			84.86		87.26	89.21	85.91
		1143		97.06													
HOP		1150		97.06		12.99				11.53			84.07				85.53
		1166		97.06		13.26							83.8				
HOR		1188		97.06		12.59		9.58	7.97	11.62			84.47		87.48	89.09	85.44
				97.06	5.49												
			1	92.57													
		1229		92.57		8.51				7.57			84.06				85
	6	1231		92.57		8.39			4.37	7.75			84.18			88.2	84.82
		1260		92.57		8.71				7.93			83.86				84.64
HOP		1267		92.57		10.11				8.16			82.46				84.41
	7	1274		92.57		9.65			5.18	8.13			82.92			87.39	84.44
HOR		1296		92.57		9.14		6.68	4.86	8.34			83.43		85.89	87.71	84.23
HOP		1341		92.57		10.58				8.94			81.99				83.63
HOR		1364		92.57		9.77		7.32	6.27	9.04			82.8		85.25	86.3	83.53
HOP		1397		92.57		11.66				9.61			80.91				82.96
HOR		1409		92.57		9.91				9.34			82.66				83.03
				92.57	8.49												
			6.23	90.31													
HOP		1423		90.31		8.77				7.47			81.54				82.84
HOR		1467		90.31		8.31		5.14	4.4	7.85			82		85.17	85.91	82.66
		1481		90.31													
		1496		90.31		8.87				8.45			81.44				81.86
		1523		90.31													
		1530		90.31		10.48				8.84			79.83				81.47
HOP		1545		90.31		10.55				9.1			79.76				81.21
HOR		1562		90.31		9.7				9.14			80.61				81.17
		1592		90.31		10.64				9.4			79.67				80.91
		1627		90.31		10.45							79.86				
		1644.5		90.31		10.36		7.52		8.45			79.95		82.79		80.86
HOP	8	1652		90.31		11.32			7.42	8.95			78.99			82.69	80.36
		1678		90.31		11.32				8.97			78.99				80.34
HOR		1708		90.31		10.88		7.04	7.23	8.98			79.43		83.27	83.08	80.33
		1719		90.31		11.16				10.6			79.15				79.71
		1819		90.31		13		9.31	8.35	12.1			77.31		81	81.96	78.21

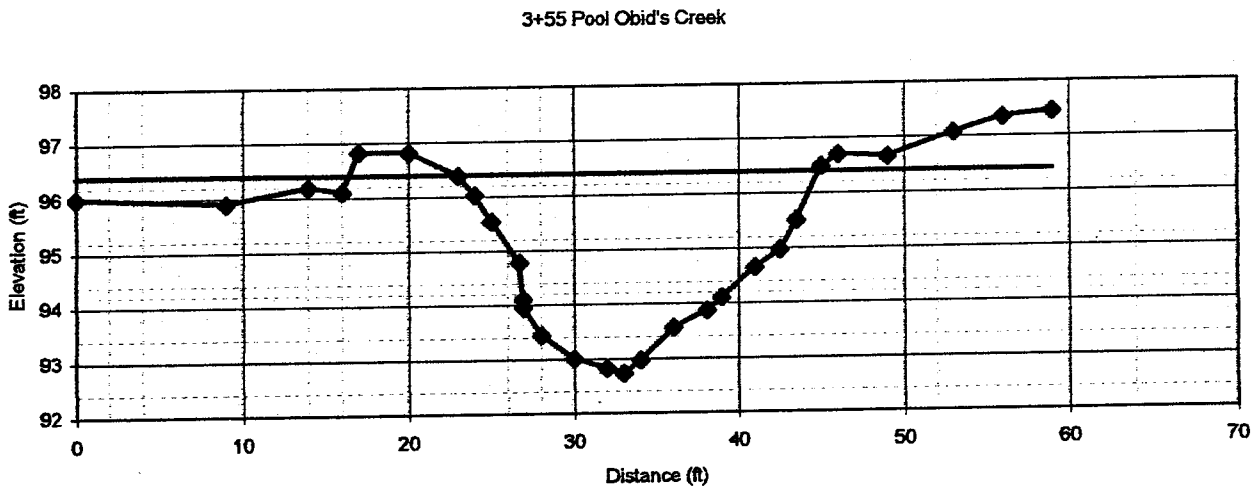
Stream:	Obid's Creek
Watershed:	South Fork New River
Location:	—
Latitude:	—
Longitude:	—
County:	Ashe County
Date:	1/9-1/10/03
Observers:	JM, SS
Channel Type:	C4
Drainage Area (sq mi):	3.5

Dimension

		typical	min	max
Riffle:	x-area bankfull	50.5		
	width bankfull	37.0		
	hydraulic radius	1.3		
	max depth	2.9		
	bank ht	4		
	width flood prone area	100.0		
	mean depth	1.36		
Pool:	x-area pool	55	52.9	59.9
	width pool	30	25.9	45.8
	hydraulic radius	1.5		
	max depth pool	4	3.7	4.1
	bank ht	4.5	3.9	5.6
Run:	x-area run	51.5		
	width run	37	36.1	38.7
	hydraulic radius	1.3		
	max depth run	3.75	3.6	3.9
	bank ht	4.5	4.2	4.8
Glide:	x-area glide			
	width glide			
	max depth glide			

Dimensionless Ratios:	typical	min	max
Width/Depth Ratio	27.1		
Entrenchment Ratio	2.7		
Riffle Max Depth Ratio	2.1	—	—
Pool Area Ratio	1.1	1.0	1.2
Pool Width Ratio	0.8	0.7	1.2
Pool Max Depth Ratio	2.9	2.7	3.0
Bank Height Ratio	1.4		
Run Area Ratio	1.0	—	—
Run Width Ratio	1.0	1.0	1.0
Run Max Depth Ratio	2.7	2.6	2.9
Glide Area Ratio	—	—	—
Glide Width Ratio	—	—	—
Glide Max Depth Ratio	—	—	—

Hydraulics:	riffle	pool	run
channel slope (%)	1.100		
discharge rate, Q (cfs)	313.0		
velocity (ft/sec)	6.2	5.7	6.1
shear stress @ max depth (lbs/ft sq)	1.991	2.746	2.574
shear stress (lbs/ft sq)	0.892	1.030	0.858
shear velocity (ft/sec)	0.679	0.729	0.665
stream power (lbs/sec)	214.8	214.8	214.8
unit stream power (lbs/ft/sec)	5.807	5.807	5.807
relative roughness	—	—	—
friction factor u/u*	9.1	7.8	9.1
threshold grain size @ max depth (mm)	278	520	458
threshold grain size (mm)	58.1	76.7	54



section:	3+55
	Pool
	Obid's Creek
	South Fork New River
description:	fast pool below rock weir
height of instrument (ft):	102.69

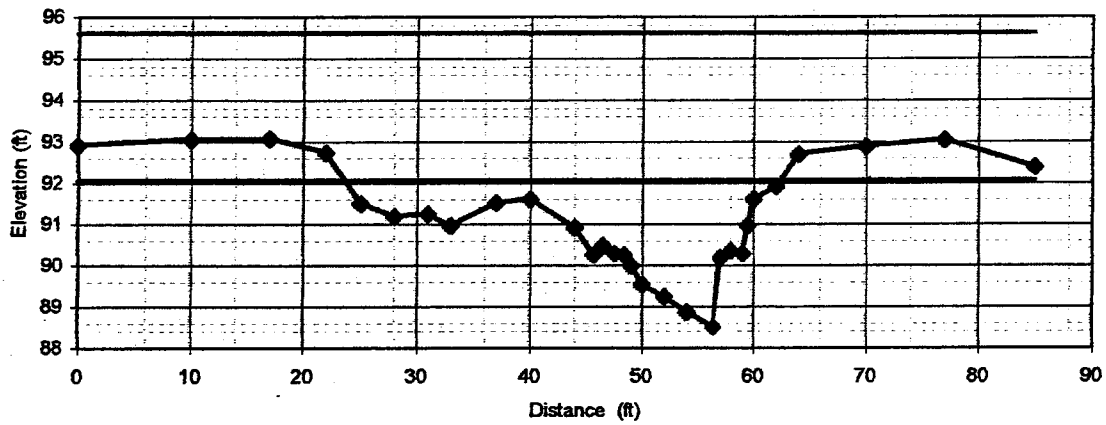
notes	omit pt.	distance (ft)	FS (ft)	elevation
at LB wooden brace		0	6.68	96.01
FLD		9	6.79	95.9
		14	6.51	96.18
		16	6.59	96.1
		17	5.86	96.83
		20	5.88	96.81
BKF		23	6.3	96.39
		24	6.66	96.03
		25	7.14	95.55
		26.7	7.9	94.79
WE		26.9	8.58	94.11
depth		26.9	8.73	93.96
		28	9.24	93.45
		30	9.68	93.01
		32	9.86	92.83
TWG		33	9.95	92.74
		34	9.72	92.97
		36	9.13	93.56
		38	8.82	93.87
WE		38.9	8.58	94.11
		41	8.03	94.66
		42.5	7.71	94.98
		43.5	7.18	95.51
		45	6.21	96.48
TOB		46	6	96.69
		49	6.04	96.65
		53	5.61	97.08
		56	5.34	97.35
at T post		59	5.25	97.44

FS bankfull	FS top of bank		channel slope (%)	
6.3	6		1.1	
96.39	96.69			

dimensions			
54.9	x-section area	1.4	d mean
38.3	width	40.2	wet P
3.7	d max	1.4	hyd radi
4.0	bank ht		

hydraulics	
0.94	shear stress ((lbs/ft sq)
0.70	shear velocity (ft/sec)
63.9	threshold grain size (mm)

7+36 Run Obid's Creek



section:	7+36
	Run
	Obid's Creek
	South Fork New River
description:	sandy bottom run
height of instrument (ft):	98.16

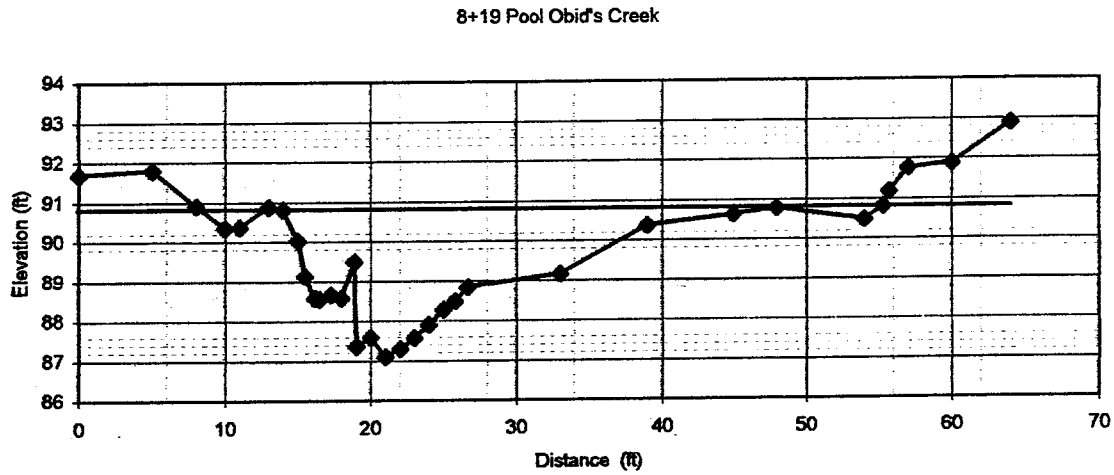
notes	omit pt.	distance (ft)	FS (ft)	elevation
pin		0	5.25	92.91
		10	5.1	93.06
		17	5.09	93.07
TOB		22	5.41	92.75
FLD		25	6.65	91.51
		28	6.97	91.19
		31	6.9	91.26
		33	7.19	90.97
		37	6.63	91.53
		40	6.54	91.62
		44	7.24	90.92
		45.7	7.89	90.27
		46.5	7.67	90.49
WS		47.5	7.86	90.3
		48.4	7.89	90.27
		49	8.16	90
		50	8.61	89.55
		52	8.91	89.25
		54	9.28	88.88
		56.4	9.65	88.51
		57	7.97	90.19
		58	7.8	90.36
WS		59	7.86	90.3
		59.5	7.18	90.98
		60	6.54	91.62
		62	6.24	91.92
TOB		64	5.46	92.7
		70	5.27	92.89
		77	5.12	93.04
pin		85	5.78	92.38

FS bankfull -	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
6.1	5.46	150.0	1.1	0.03
92.06	92.7			

dimensions			
51.5	x-section area	1.3	d mean
38.7	width	41.3	wet P
3.6	d max	1.2	hyd radi
4.2	bank ht	29.1	w/d ratio
150.0	W flood prone area	3.9	ent ratio

hydraulics	
6.0	velocity (ft/sec)
310.3	discharge rate, Q (cfs)
0.86	shear stress ((lbs/ft sq)
0.66	shear velocity (ft/sec)
5.505	unit stream power (lbs/ft/sec)
0.85	Froude number
9.1	friction factor u/u*
53.7	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		



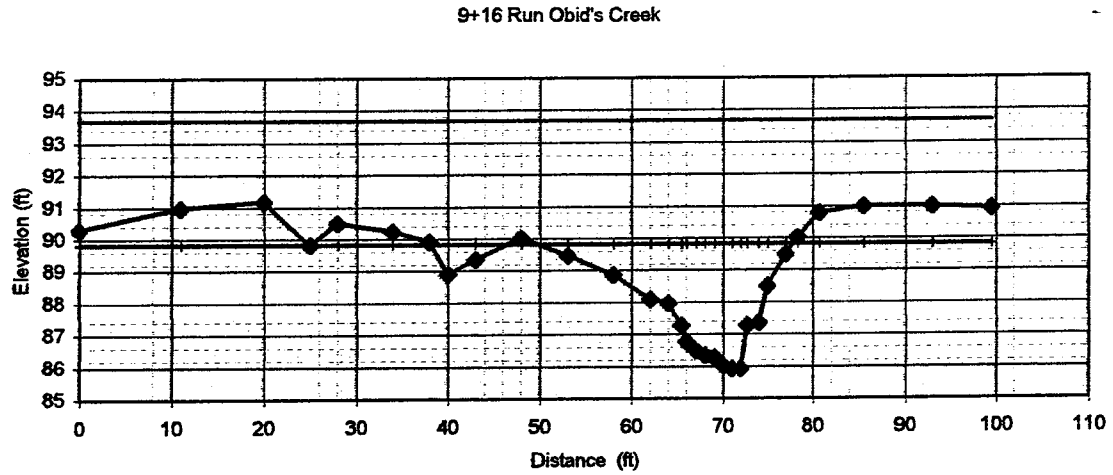
section:	8+19
	Pool
	Obid's Creek
	South Fork New River
description:	
height of instrument (ft):	97.06

notes	omit pt.	distance (ft)	FS (ft)	elevation
at fence	■	0	5.37	91.69
TOB/FLD	■	5	5.25	91.81
	■	8	6.15	90.91
	■	10	6.71	90.35
	■	11	6.69	90.37
	■	13	6.19	90.87
BKf	■	14	6.24	90.82
TO Rock	■	15	7.03	90.03
	■	15.5	7.92	89.14
WE/WS	■	16.2	8.47	88.59
	■	16.5	8.5	88.56
rootwd	■	17.3	8.39	88.67
	■	18	8.47	88.59
TO RW	■	18.9	7.56	89.5
edge of RW	■	19	9.7	87.36
	■	20	9.47	87.59
TWG	■	21	9.96	87.1
	■	22	9.76	87.3
	■	23	9.49	87.57
	■	24	9.15	87.91
	■	25	8.79	88.27
RWE	■	25.8	8.58	88.48
	■	26.7	8.22	88.84
	■	33	7.89	89.17
	■	39	6.68	90.38
	■	45	6.43	90.63
	■	48	6.28	90.78
	■	54	6.57	90.49
BKF	■	55.3	6.24	90.82
	■	55.7	6.88	91.18
	■	57	6.29	91.77
	■	60	6.18	91.88
at pin	■	64	4.16	92.9

FS bankfull	FS top of bank		channel slope (%)	
6.24	6.25		1.3	
90.82	91.81			

dimensions			
54.2	x-section area	1.2	d mean
45.8	width	49.9	wet P
3.7	d max	1.1	hyd radi
4.7	bank ht		

hydraulics	
0.75	shear stress ((lbs/ft sq)
0.62	shear velocity (ft/sec)
47.8	threshold grain size (mm)



section:	9+16
	Run
	Obid's Creek
	South Fork New River
description:	fast run
height of instrument (ft):	97.06

notes	omit pt.	distance (ft)	FS (ft)	elevation
at T post		0	6.76	90.3
		11	6.09	90.97
		20	5.88	91.18
BKF		25	7.25	89.81
		28	6.56	90.5
		34	6.81	90.25
		38	7.15	89.91
		40	8.15	88.91
		43	7.71	89.35
		48	7.04	90.02
		53	7.59	89.47
		58	8.2	88.86
		62	8.97	88.09
		64	9.08	87.98
WS		65.4	9.78	87.28
		66	10.27	86.79
		67	10.57	86.49
		68	10.7	86.36
		69	10.76	86.3
		70	11.02	86.04
		71	11.12	85.94
		72	11.12	85.94
WS		72.7	9.78	87.28
		74	9.7	87.36
		75	8.56	88.5
		77	7.57	89.49
		78.3	7.04	90.02
TOB		80.7	6.28	90.78
FLD		85.5	6.07	90.99
		93	6.07	90.99
at post		99.5	6.12	90.94

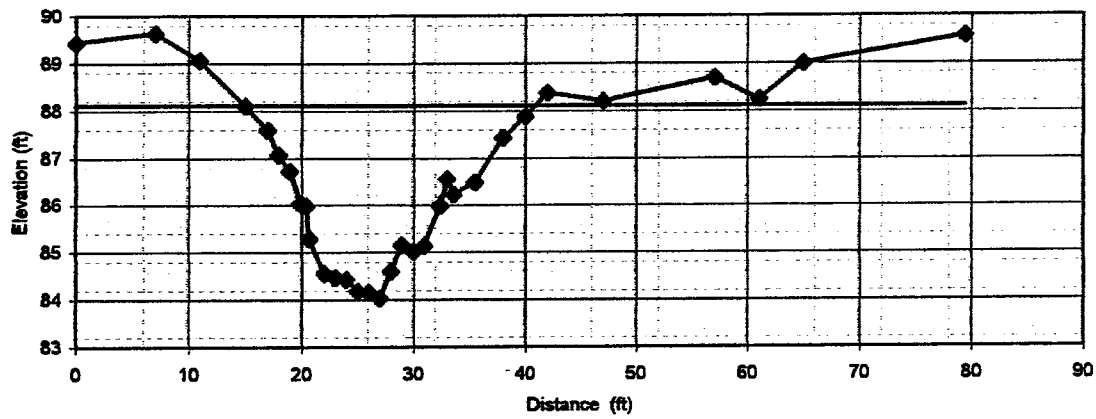
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
7.25	6.28	100.0	1.1	0.03
89.81	90.78			

dimensions			
51.5	x-section area	1.4	d mean
36.1	width	38.6	wet P
3.9	d max	1.3	hyd radi
4.8	bank ht	25.3	w/d ratio
100.0	W flood prone area	2.8	ent ratio

hydraulics	
6.3	velocity (ft/sec)
324.2	discharge rate, Q (cfs)
0.92	shear stress ((lbs/ft sq)
0.69	shear velocity (ft/sec)
6.162	unit stream power (lbs/ft/sec)
0.86	Froude number
9.2	friction factor u/u*
61.1	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

10+88 Pool Obid's Creek



section:	10+88
	Pool
	Obid's Creek
	South Fork New River
description:	pool at rootwads below rock weir at upper crossing
height of instrument (ft):	97.06

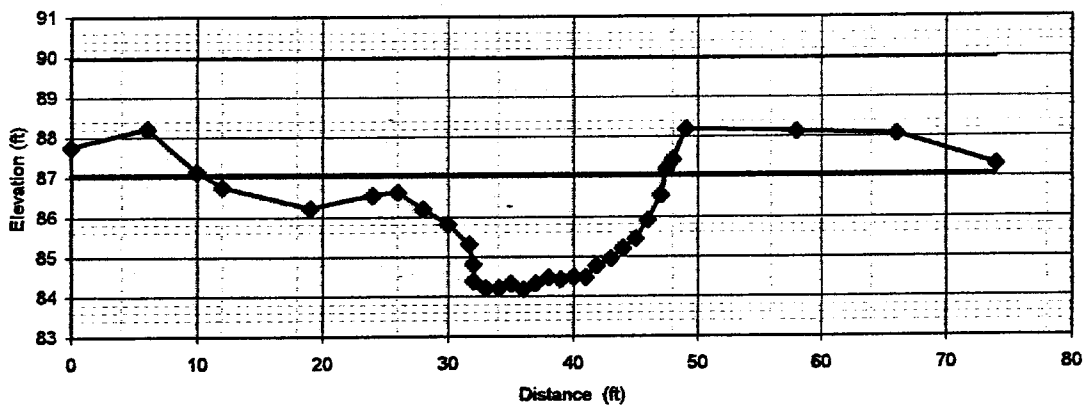
notes	omit pt.	distance (ft)	FS (ft)	elevation
at fence	■	0	7.62	89.44
TOB	■	7	7.42	89.64
	■	11	8	89.06
BKF	■	15	8.95	88.11
	■	17	9.46	87.6
	■	18	9.99	87.07
	■	19	10.33	86.73
	■	19.9	11.01	86.05
WE	■	20.4	11.07	85.99
	■	20.7	11.77	85.29
	■	22	12.5	84.56
	■	23	12.58	84.48
	■	24	12.62	84.44
	■	25	12.87	84.19
	■	26	12.9	84.16
TWG	■	27	13.01	84.05
	■	28	12.45	84.61
	■	29	11.91	85.15
	■	30	12.04	85.02
	■	31	11.92	85.14
WE	■	32.4	11.07	85.99
	■	33	10.49	86.57
	■	33.6	10.82	86.24
	■	35.5	10.57	86.49
	■	38	9.63	87.43
	■	40	9.18	87.88
	■	42	8.68	88.38
	■	47	8.86	88.2
	■	57	8.37	88.69
	■	61	8.81	88.25
	■	65	8.06	89
at post	■	79.4	7.48	89.58
	■			

FS bankfull	FS top of bank		channel slope (%)	
8.95	7.42		1.1	
88.11	89.64			

dimensions			
54.9	x-section area	2.1	d mean
25.9	width	28.2	wet P
4.1	d max	1.9	hyd radi
5.6	bank ht		

hydraulics	
1.34	shear stress ((lbs/ft sq)
0.83	shear velocity (ft/sec)
~~127.4~~	threshold grain size (mm)

12+31 Riffle Obid's Creek



section:	12+31
	Riffle
	Obid's Creek
	South Fork New River
description:	stable, close to old 12+51
height of instrument (ft):	92.57

notes	omit pt.	distance (ft)	FS (ft)	elevation
at fence	■	0	4.81	87.76
	■	6	4.35	88.22
FLD	■	10	5.43	87.14
	■	12	5.81	86.76
	■	19	6.34	86.23
	■	24	6.03	86.54
	■	26	5.95	86.62
	■	28	6.36	86.21
	■	30	6.75	85.82
	■	31.7	7.25	85.32
WS	■	32	7.75	84.82
	■	32	8.17	84.4
	■	33	8.35	84.22
	■	34	8.35	84.22
	■	35	8.24	84.33
	■	36	8.39	84.18
	■	37	8.25	84.32
	■	38	8.1	84.47
	■	39	8.15	84.42
	■	40	8.08	84.49
	■	41	8.09	84.48
WS	■	41.9	7.8	84.77
	■	43	7.63	84.94
	■	44	7.37	85.2
	■	45	7.13	85.44
	■	46	6.65	85.92
	■	47	6.02	86.55
	■	47.5	5.36	87.21
	■	48	5.13	87.44
TOB	■	49	4.37	88.2
	■	58	4.44	88.13
	■	66	4.6	88.07
at post	■	74	5.27	87.3
	■			

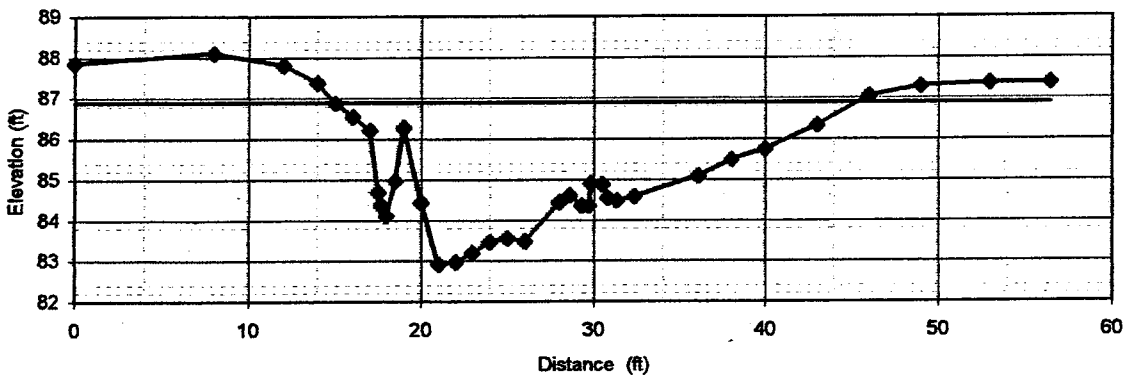
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
5.5	4.37	100.0	1.1	0.03
87.07	88.2			

dimensions			
50.5	x-section area	1.4	d mean
37.0	width	38.7	wet P
2.9	d max	1.3	hyd radi
4.0	bank ht	27.1	w/d ratio
100.0	W flood prone area	2.7	ent ratio

hydraulics	
6.2	velocity (ft/sec)
313.6	discharge rate, Q (cfs)
0.90	shear stress ((lbs/ft sq)
0.68	shear velocity (ft/sec)
5.813	unit stream power (lbs/ft/sec)
0.88	Froude number
9.1	friction factor u/u*
58.6	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

12+74 Pool Obid's Creek



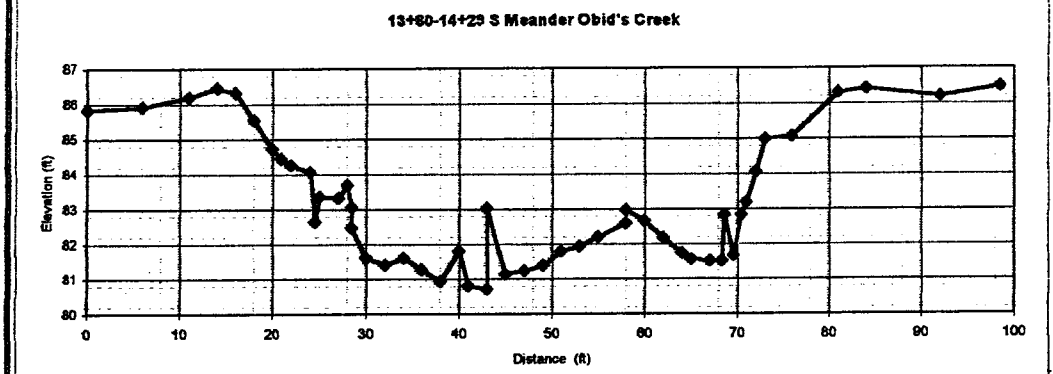
section:	12+74
	Pool
	Obid's Creek
	South Fork New River
description:	tail of pool at RW below rock weir
height of instrument (ft):	92.57

notes	omit pt.	distance (ft)	FS (ft)	elevation
at fence	☐	0	4.7	87.87
	☐	8	4.47	88.1
	☐	12	4.75	87.82
	☐	14	5.18	87.39
BKF	☐	15	5.67	86.9
	☐	16	6.01	86.56
	☐	17	6.35	86.22
hole	☐	17.5	7.87	84.7
ws	☐	17.7	8.19	84.38
	☐	18	8.45	84.12
	☐	18.5	7.59	84.98
	☐	19	6.28	86.29
ws	☐	20	8.13	84.44
	☐	21	9.65	82.92
	☐	22	9.6	82.97
	☐	23	9.38	83.19
	☐	24	9.11	83.46
	☐	25	9.01	83.56
	☐	26	9.09	83.48
ws	☐	28	8.13	84.44
	☐	28.6	7.95	84.62
we	☐	29.3	8.21	84.36
	☐	29.7	8.21	84.36
	☐	29.8	7.65	84.92
	☐	30.5	7.68	84.89
we	☐	30.8	8.02	84.55
	☐	31.3	8.09	84.48
we	☐	32.3	7.99	84.58
	☐	36	7.48	85.09
	☐	38	7.08	85.49
	☐	40	6.83	85.74
	☐	43	6.23	86.34
	☐	46	5.52	87.05
	☐	49	5.27	87.3
	☐	53	5.2	87.37
at pin	☐	56.5	5.18	87.39
	☐			

FS bankfull	FS top of bank		channel slope (%)	
5.67	5.18		1.1	
86.9	87.39			

dimensions			
59.9	x-section area	2.0	d mean
30.4	width	36.4	wet P
4.0	d max	1.6	hyd radi
4.5	bank ht		

hydraulics	
1.13	shear stress (lbs/ft sq)
0.76	shear velocity (ft/sec)
91.9	threshold grain size (mm)



section:	13+80-14+29
	Riffle
	Obid's Creek
	South Fork New River
description:	S meander
height of instrument (ft):	90.31

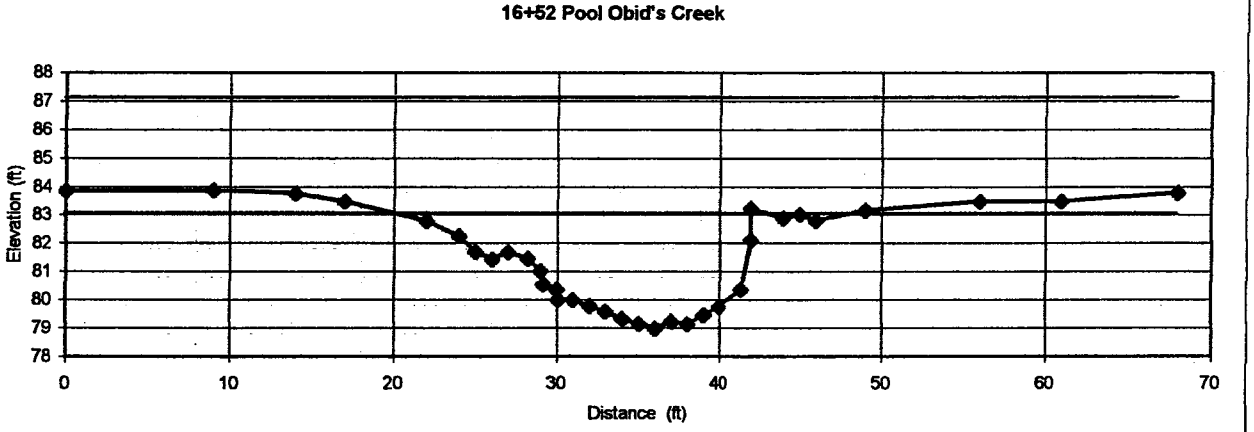
notes	omit pt.	distance (ft)	FS (ft)	elevation
		0	4.48	85.83
		6	4.38	85.93
		11	4.1	86.21
		14	3.85	86.46
		16	3.97	86.34
		18	4.75	85.56
		20	5.57	84.74
		21	5.84	84.47
		22	6.04	84.27
		24	6.23	84.08
		24.6	7.66	82.65
		25	6.94	83.37
		27	6.97	83.34
		28	6.61	83.7
		28.5	7.24	83.07
		28.5	7.83	82.48
		30	8.7	81.61
		32	8.9	81.41
		34	8.69	81.62
		36	9.03	81.28
		38	9.36	80.95
		40	8.5	81.81
		41	9.5	80.81
		43	9.58	80.73
		43	7.28	83.03
		45	9.17	81.14
		47	9.07	81.24
		49	8.92	81.39
		51	8.52	81.79
		53	8.36	81.95
		55	8.11	82.2
		58	7.71	82.6
		58	7.33	82.98
		60	7.65	82.66
		62	8.12	82.19
		64	8.57	81.74
		65	8.73	81.58
		67	8.8	81.51
		68.3	8.8	81.51
		68.6	7.48	82.83
		69.6	8.65	81.66
		70.4	7.48	82.83
		71	7.11	83.2
		72	6.23	84.08
		73	5.31	85
		76	5.23	85.08
		81	3.99	86.32
		84	3.88	86.43
		92	4.1	86.21
		98.5	3.83	86.48

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
			1.1	
0	—			

dimensions			
0.0	x-section area	0.0	d mean
0.0	width	0.0	wet P
0.0	d max	0.0	hyd radi
0.0	bank ht	0.0	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
0.0	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		



section:	16+52
	pool
	Obid's Creek
	South Fork New River
description:	pool below rock weir, lower xing
height of instrument (ft):	90.31

notes	omit pt.	distance (ft)	FS (ft)	elevation
at fence		0	6.45	83.86
		9	6.43	83.88
		14	6.55	83.76
		17	6.82	83.49
		22	7.51	82.8
		24	8.03	82.28
		25	8.59	81.72
at rocks		26	8.88	81.43
on rocks		27	8.62	81.69
on rocks		28.2	8.84	81.47
on rocks		29	9.28	81.03
on rocks		29.2	9.76	80.55
on rocks		30	9.95	80.36
WE		30.1	10.31	80
		31	10.31	80
		32	10.5	79.81
		33	10.72	79.59
		34	10.96	79.35
		35	11.15	79.16
TWG		36	11.32	78.99
		37	11.07	79.24
		38	11.17	79.14
		39	10.86	79.45
		40	10.55	79.76
WE		41	9.95	80.36
		42	8.19	82.12
		43	7.08	83.23
TOE		44	7.42	82.89
		45	7.27	83.04
		46	7.5	82.81
		49	7.14	83.17
		56	6.83	83.48
		61	6.83	83.48
TOE		68	6.52	83.79

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
7.25	7.42	100.0	1.1	0.05
83.06	82.89			

dimensions			
52.9	x-section area	2.0	d mean
27.0	width	30.6	wet P
4.1	d max	1.7	hyd radi
3.9	bank ht	13.7	w/d ratio
100.0	W flood prone area	3.7	ent ratio

hydraulics	
7.5	velocity (ft/sec)
395.9	discharge rate, Q (cfs)
1.19	shear stress ((lbs/ft sq)
0.78	shear velocity (ft/sec)
10.076	unit stream power (lbs/ft/sec)
0.89	Froude number
9.6	friction factor u/u*
101.1	threshold grain size (mm)

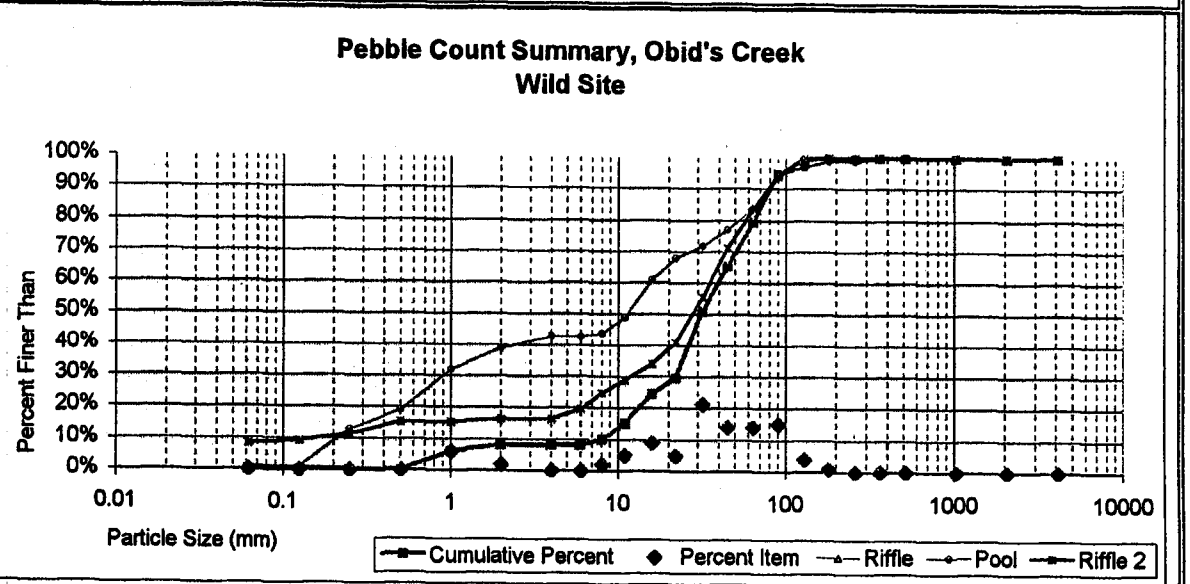
check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Weighted Pebble Count

Percent Riffle:	69	Percent Run:	
Percent Pool:	31	Percent Glide:	

Pebble Count,
Obid's Creek
South Fork New River
Note:

Material	Size Range (mm)		Total #	
silt/clay	0	0.062	0.0	#
very fine sand	0.062	0.13	0.0	#
fine sand	0.13	0.25	0.0	#
medium sand	0.25	0.5	0.0	#
coarse sand	0.5	1	4.2	#
very coarse sand	1	2	1.4	#
very fine gravel	2	4	0.0	#
fine gravel	4	6	0.0	#
fine gravel	6	8	1.4	#
medium gravel	8	11	3.5	#
medium gravel	11	16	6.3	#
coarse gravel	16	22	3.5	#
coarse gravel	22	32	14.8	#
very coarse gravel	32	45	9.9	#
very coarse gravel	45	64	9.9	#
small cobble	64	90	10.6	#
medium cobble	90	128	2.8	#
large cobble	128	180	0.7	#
very large cobble	180	256	0.0	#
small boulder	256	362	0.0	#
small boulder	362	512	0.0	#
medium boulder	512	1024	0.0	#
large boulder	1024	2048	0.0	#
very large boulder	2048	4096	0.0	#
bedrock			0.0	#
		Weighted Count:	69	
		True Total Particle Count:	295	



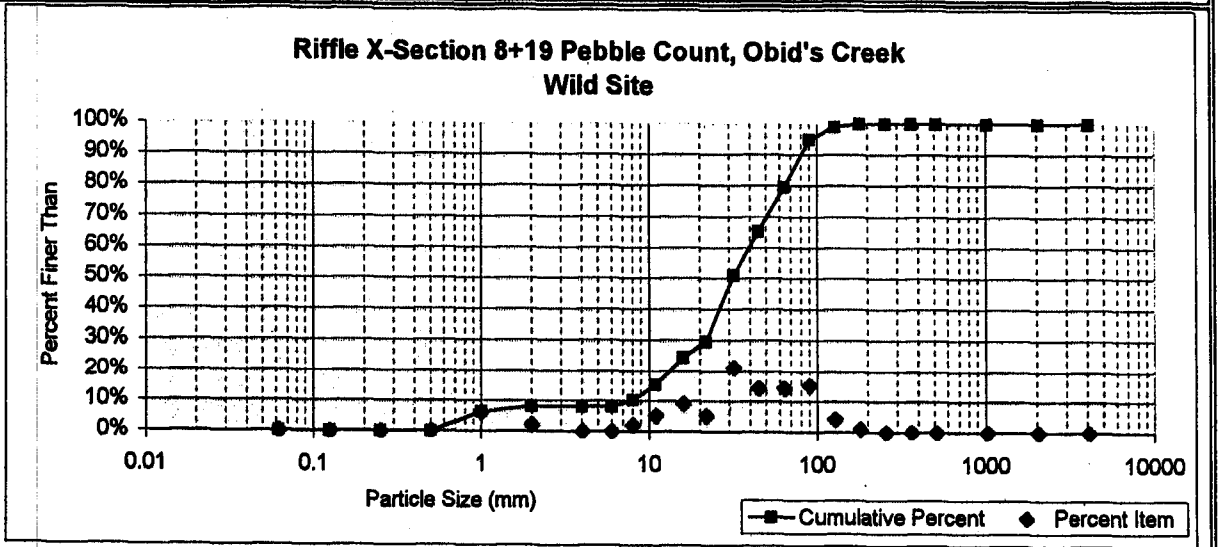
Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
11.316	24.18	31.4	71	91	0%	8%	71%	20%	0%	0%

Riffle X-Section Pebble Count

Material	Size Range (mm)		Count	
silt/clay	0	0.062		#
very fine sand	0.062	0.13		#
fine sand	0.13	0.25		#
medium sand	0.25	0.5		#
coarse sand	0.5	1	6	#
very coarse sand	1	2	2	#
very fine gravel	2	4		#
fine gravel	4	6		#
fine gravel	6	8	2	#
medium gravel	8	11	5	#
medium gravel	11	16	9	#
coarse gravel	16	22	5	#
coarse gravel	22	32	21	#
very coarse gravel	32	45	14	#
very coarse gravel	45	64	14	#
small cobble	64	90	15	#
medium cobble	90	128	4	#
large cobble	128	180	1	#
very large cobble	180	256		#
small boulder	256	362		#
small boulder	362	512		#
medium boulder	512	1024		#
large boulder	1024	2048		#
very large boulder	2048	4096		#
bedrock				#
	Total Particle Count:		98	

Riffle Pebble Count,
Obid's Creek
South Fork New River

Note: 8+19 (8+50)



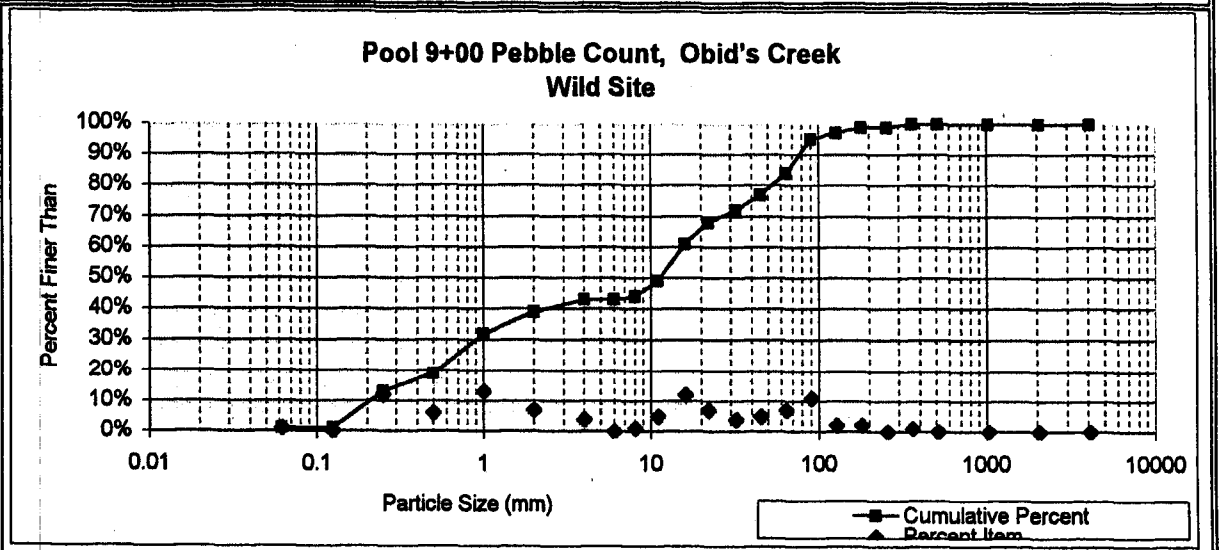
Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
11.316	24.18	31.4	71	91	0%	8%	71%	20%	0%	0%

Pool Pebble Count

Material	Size Range (mm)		Count	
silt/clay	0	0.062	1	# #
very fine sand	0.062	0.13		# #
fine sand	0.13	0.25	12	# #
medium sand	0.25	0.5	6	# #
coarse sand	0.5	1	13	# #
very coarse sand	1	2	7	# #
very fine gravel	2	4	4	# #
fine gravel	4	6		# #
fine gravel	6	8	1	# #
medium gravel	8	11	5	# #
medium gravel	11	16	12	# #
coarse gravel	16	22	7	# #
coarse gravel	22	32	4	# #
very coarse gravel	32	45	5	# #
very coarse gravel	45	64	7	# #
small cobble	64	90	11	# #
medium cobble	90	128	2	# #
large cobble	128	180	2	# #
very large cobble	180	256		# #
small boulder	256	362	1	# #
small boulder	362	512		# #
medium boulder	512	1024		# #
large boulder	1024	2048		# #
very large boulder	2048	4096		# #
bedrock				#
	Total Particle Count:		100	

Run Pebble Count,

	Obid's Creek
	South Fork New River
	0
Note:	9+00 pool below rock weir



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.354	1.35	11.3	64	90	1%	38%	45%	15%	1%	0%

Riffle Pebble Count

Material	Size Range (mm)		Count	
silt/clay	0	0.062	8	# #
very fine sand	0.062	0.13	1	# #
fine sand	0.13	0.25	2	# #
medium sand	0.25	0.5	4	# #
coarse sand	0.5	1		# #
very coarse sand	1	2	1	# #
very fine gravel	2	4		# #
fine gravel	4	6	3	# #
fine gravel	6	8	5	# #
medium gravel	8	11	4	# #
medium gravel	11	16	5	# #
coarse gravel	16	22	7	# #
coarse gravel	22	32	14	# #
very coarse gravel	32	45	15	# #
very coarse gravel	45	64	12	# #
small cobble	64	90	10	# #
medium cobble	90	128	6	# #
large cobble	128	180		# #
very large cobble	180	256		# #
small boulder	256	362		# #
small boulder	362	512		# #
medium boulder	512	1024		# #
large boulder	1024	2048		# #
very large boulder	2048	4096		# #
bedrock				#
	Total Particle Count:		97	

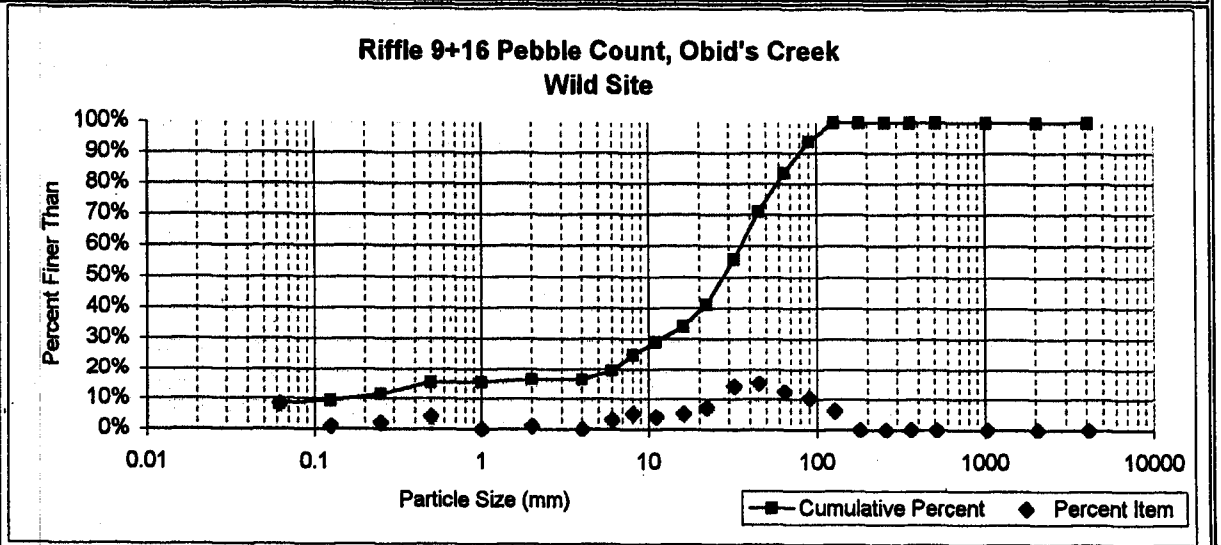
Glide Pebble Count,

Obid's Creek

South Fork New River

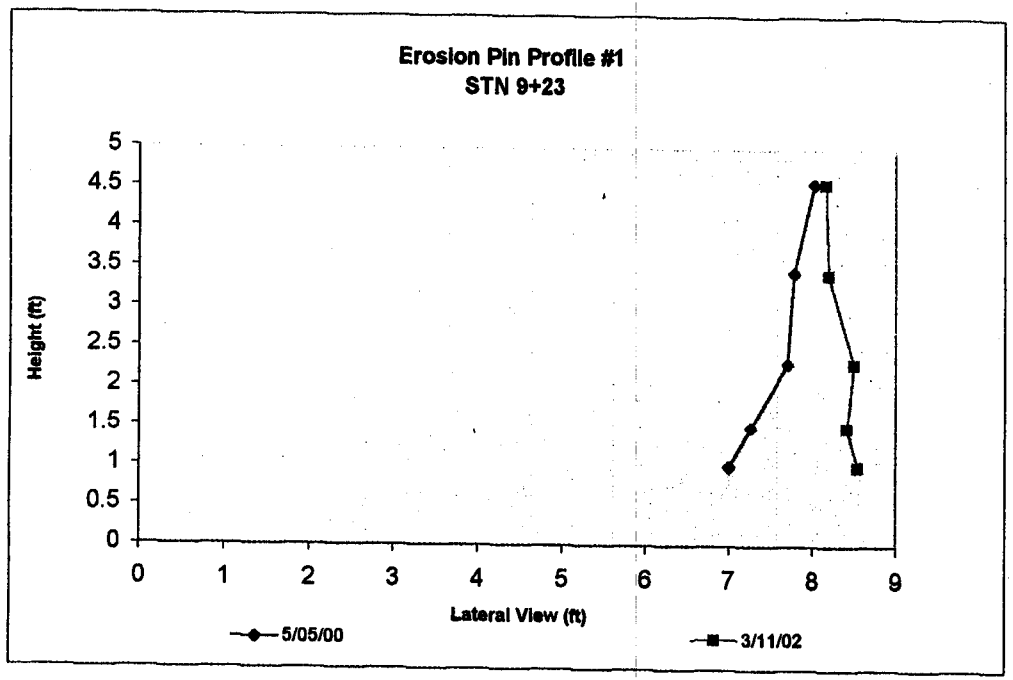
0

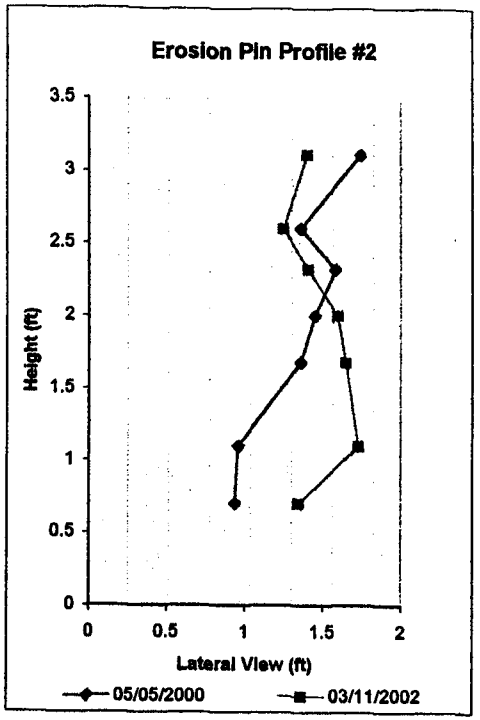
Note: **9+16 at lower rock weir**



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
1.434	16.71	27.6	65	96	8%	8%	67%	16%	0%	0%

Erosion Pin Data Collected 5/05/00 and 3/11/02
Wild Site, Obid's Creek





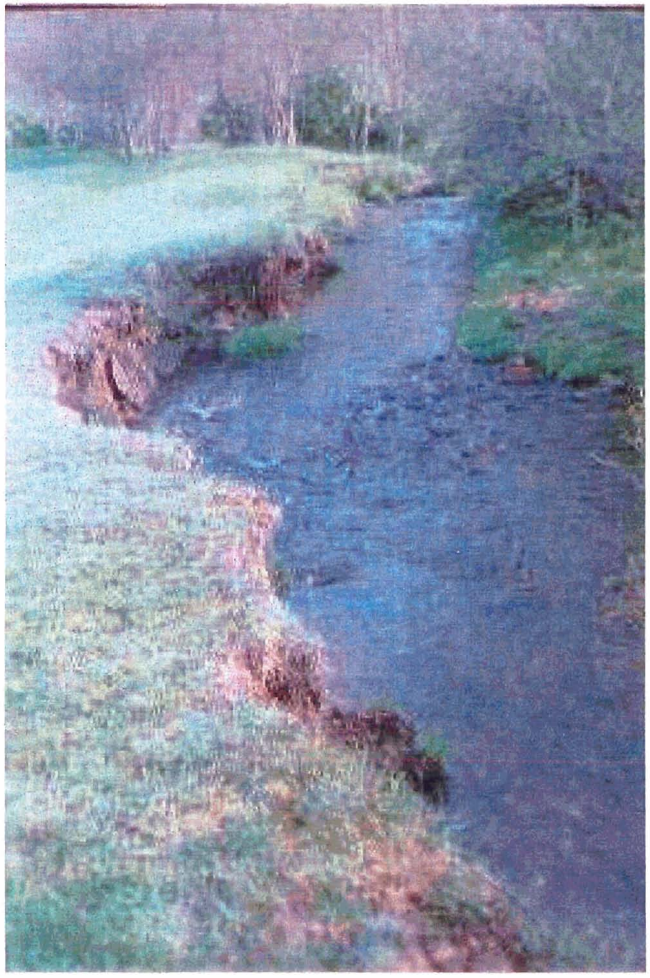
Appendix 2

Photos of the Wild Site, Obids Creek

Pre-construction, flood and post-construction photos of major work sites

STN 7+75-8+50

Looking downstream

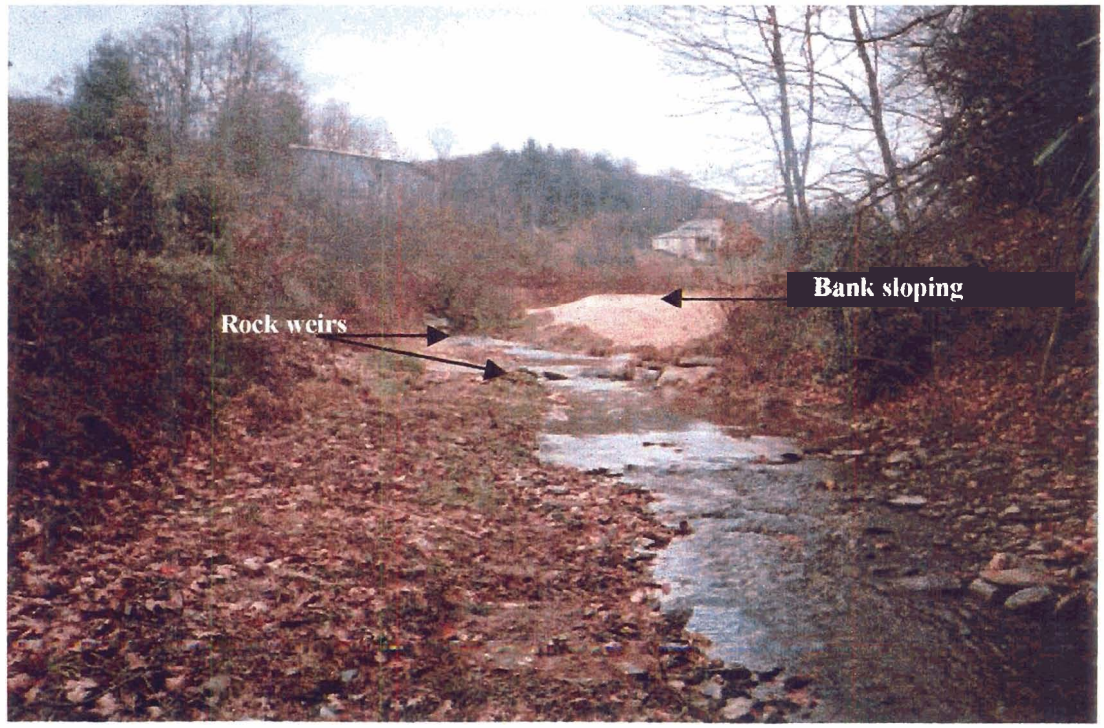


Pre-Construction 4/02

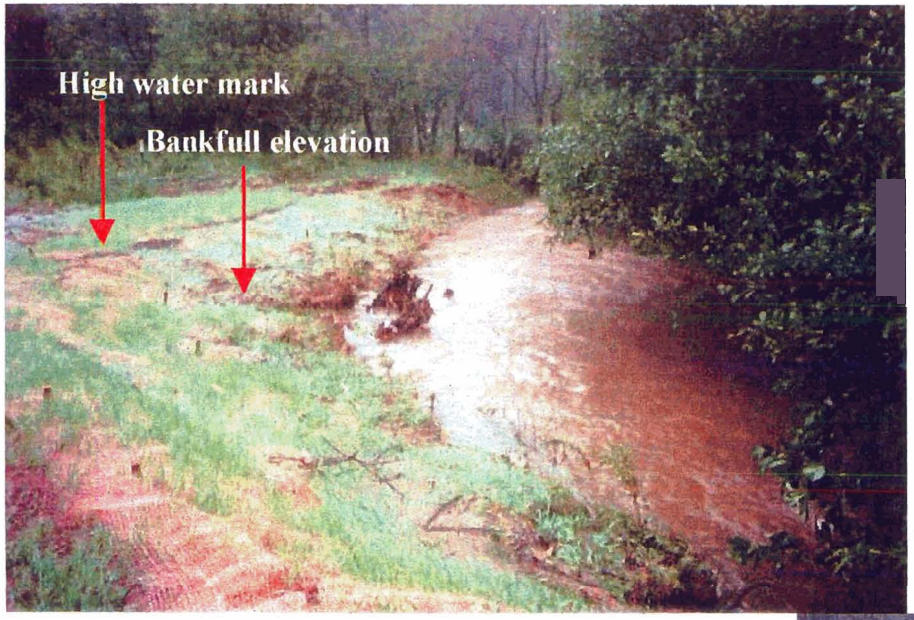
Looking up stream, rock weir, root wads, rock vane and bank sloping

Post-Construction 9/23/02

Before construction (above): Lower end of Laxon Creek just above confluence with South Fork New River. Severely eroding right bank across from person in the picture. In-stream habitat lacking in this area, a long shallow riffle.
After construction (below): Banks was sloped and two rock weirs were constructed for grade control and step/pool habitat. One rock vane was also constructed to divert water away from an eroding bank (not shown). X-S 8+40



STN 7+75-8+50 (cont)



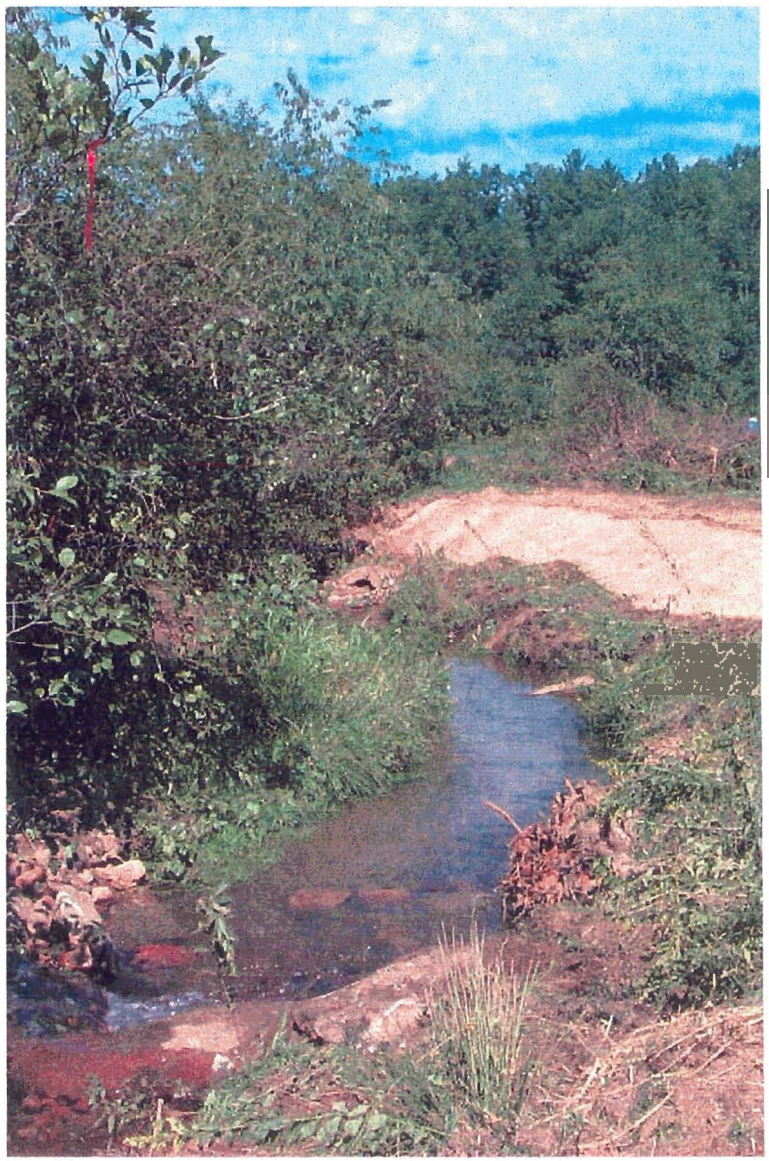
Flood immediately following construction

9/27/02

After Flood 1/9/02

STN 8+65-9+60 Looking downstream, bank sloping, rock weir, root wads, bank log

Pre-Construction 4/02



Post-Construction 9/23/02

STN 8+65-9+60 LDS (cont.)

Flood, 6" rain, 9/27/02

After Flood 12-02

STN 10+64-11+27, Upper Crossing

Pre-Construction 4/02

Post-Construction 9/23/02

Flood immediately following construction 9/27/02

STN 10+64-11+27

Upper Xing after flood 12/02

COPY

BK 286 PG 651

Issued Dec 20 2002
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Real Estate Excise Tax

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by: SHIRLEY B. WALLACE
REGISTER OF DEEDS
BOOK 286 PAGE 651-658

By: Maude L. Goodman, Deputy

CONSERVATION EASEMENT and EASEMENTS OF INGRESS AND EGRESS

THIS INSTRUMENT DRAWN BY A. A. Adams CHECKED BY Jimmy Lee Caudle

RETURN TO: Jimmy L. Caudle
Division Right of Way Agent
P.O. Box 250
North Wilkesboro, NC 28659

State of North Carolina
Ashe County
Obids Township

I.D. No. **R-0529 WM**
State Project: **6.759005T**
F.A. Project: **N/A**
Parcel No.: **703 WM**

THIS CONSERVATION EASEMENT and EASEMENTS OF INGRESS AND EGRESS, made this 20th day of September, 2002 by and between Jonathan F. Wild and wife Hollis H. Wild, 204 Idlewild Rd, West Jefferson, NC 28694; 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 Obids Township of Ashe County, North Carolina, as more particularly described in Book 147, Page 1502 of the Ashe 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 1805 feet of stream in Ashe 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 2.60 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 a Temporary 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 US 421 from South Fork New River to East of the Blue Ridge Parkway (R-0529 BA, R-0529 BB & R-0529 BD);

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 condition 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 $13,000.00 (Thirteen Thousand Dollars) 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 Ashe 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") over and upon the remaining Property of the Grantors described in Book 147, Page 1502 of the Ashe 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 006, Page 093 of the Ashe 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 Restoration 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 at its point of intersection with the existing right of way of SR 1003 (Idlewild Rd.) at all reasonable times to undertake additional mitigation activities as determined to be necessary by the NCDOT or WRC and 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 circumstanoes 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 landscaping, of the Conservation Easement Area is prohibited. Horticultural use of the Conservation Easement Area is permitted to the Grantor(s) for the purpose of collection of native seeds and live cuttings from silky dogwood (*Cronus amomum*) and silky willow (*Salix sericea*) provided that these activities do not negatively impact the purpose of the restoration/enhancement project by impacting stream shading and bank stability. This right does not continue with future owners. The Grantor(s) should notify the WRC by letter, email or phone in advance of collecting live cuttings. However, should the underlying ownership of the property change hands, horticultural use will be prohibited. Livestock shall only cross at areas appointed and agreed upon in the Conceptual Restoration Plan. Grantors may have access to the Conservation Easement Area for the purpose of operating irrigation pumps. Access for irrigation pumping or for the construction of a pumping station should not exceed a total of 20 linear feet over 1000 linear feet of the easement. If a pumping station is moved the Grantor should revegetate the old pump site with woody vegetation and a vegetative ground cover. When the right to pumping access is exercised the Grantor shall notify the WRC in writing at the address shown above within 3 business days of such access so that pumping sites can be noted on easement maps. In an emergency situation, in which no other water source is available, livestock may access the stream for water. 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. Any stream bank damage caused by emergency livestock access will be repaired by the Grantor to a standard defined by the conditions found in adjacent areas where livestock did not access the stream. The WRC will evaluate the site to insure and determine if the standard has been met.

3. Stream Crossings. The Grantor, for himself, his successors, assigns, invitees and licensees, hereby reserves the right to maintain the stream crossings shown in the Conceptual Restoration Plan, attached hereto as **Exhibit C**. Specifically for this property this includes 2 crossings of Obids Creek. This reservation includes the right to construct a crossing of any design that the Grantor may choose, at existing crossing locations. These crossings will not be wider than twenty-five (25) feet, will be constructed in such a way that minimizes negative impacts to the stream and riparian vegetation and will be done with all necessary state and federal permits. The WRC may agree to the Grantor moving existing stream crossings, installing new crossings or widening the existing stream crossings and construction and access easements, if needed in the future, provided that any such request is consistent with the purposes of this Conservation Easement and the Grantor obtains prior written approval from the WRC. These crossings and construction and access easements shall not exceed a width of fifty (50) feet and will be constructed in such a way that minimizes negative impacts to the stream and riparian vegetation.

4. Silvicultural Use and Land Clearing. There may be no destruction or cutting of trees or plants in the Conservation Easement Area, except as specifically provided for in Article II, paragraph 2 and in accordance with the Conceptual Restoration 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 is prohibited. Removal of nonnative invasive vegetation may be allowed by manual means or herbicides provided that this activity is consistent with the purposes of this Conservation Easement and the Grantor obtains prior written approval from the WRC. If WRC has not approved or denied in writing the removal of nonnative invasive vegetation within ten working days after written request from the Grantors, WRC approval is deemed granted.

5. 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.

6. 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.

7. 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 their successors which would cause erosion or siltation on the Conservation Easement Area. The grantor retains the ability to access the existing ditch drain lines as necessary for maintenance and repairs so they will remain functional and not lead to impaired use of the adjacent farmland not covered by this conservation easement. The grantor will contact the WRC one week prior to beginning work in the easement area. Work in the easement area will be repaired to the satisfaction of the WRC".

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

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

10. Commercial Use. Commercial activities not specified in this agreement within the Conservation Easement Area are prohibited

11. 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 Restoration Plan, **Exhibit C**, for the Conservation Easement Area.

12. 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.

13. Subdivision. In the event the burdened parcel is subdivided, it is understood that the rights and duties under this conservation easement run with the subdivided parcels and do not change.

14. 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.

15. Utilities. The installation of utility systems, including, without limitation, water, sewer, power, fuel, and communication lines and related facilities, except at stream crossings, 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. If utility lines need to cross at locations other than designated stream crossings, the WRC must be notified in advance to obtain permission for a utility crossing outside of designated areas.

16. Water Quality and Drainage Pattern. Grantor shall conduct no activities 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, unless agreed to in writing by the WRC. Diking, dredging, alteration, draining, filling or removal of wetlands or stream by the Grantor is prohibited, unless agreed to in writing by the WRC. 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 (except as specifically provided for in Article II, paragraph 7); 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.

17. Grantor's Rights. The Grantor, for themselves, their 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 exists 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.

18. 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 Restoration 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 man-made materials as needed to direct in-stream, above ground, and subterraneous water flow; planting of trees, shrubs and herbaceous vegetation; collecting live cuttings; 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. Furthermore, should any restoration of repair of the Conservation Easement Area be necessary, the WRC reserves the right to use the original Temporary Access Easement for these purposes.

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 and/or Temporary 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 006, Page 093 of the Ashe County Registry are incorporated in and made a part of this instrument by reference. The parties acknowledge that the Conceptual Restoration Plan, developed

by a WRC biologist and dated **October 2000** (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 Access Easements of Ingress and Egress; that the Conservation Easement Area and Temporary 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 addresses 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 Easement 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 Ashe 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 payment of all taxes, assessments, fees, and charges of whatever description levied on or assessed against the property.

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, WRC, and NCDOT, their heirs, executors, 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):

Jonathan F. Wild (Seal)

Hollis H. Wild (Seal)

_____ (Seal)

_____ (Seal)

_____ (Seal)

_____ (Seal)

NORTH CAROLINA, COUNTY OF Ashe

BK 286 PG 657

I, Anthony A. Adams a Notary Public of Alexander County do hereby certify that Jonathan F. Wild and wife Hollis H. Wild, 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 20 day of September, 2002.

Anthony A. Adams
Notary Public

My Commission Expires: 2-20-2005

NOTARY PUBLIC ALEXANDER COUNTY, NC ANTHONY A. ADAMS

NCDOT:
ACCEPTED FOR THE DEPARTMENT OF TRANSPORTATION BY:

NOV 19 2002

name and title ASS'T MANAGER OF RIGHT OF WAY

NORTH CAROLINA, COUNTY OF Sampson

I, Neal O. Strickland a Notary Public of Sampson County do hereby certify that A.O. Allison II, Ass't Manager Right of Way, 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 18 day of November, 2002.

Notary Public

My Commission Expires: March 29, 2007

WRC:
ACCEPTED FOR THE WILDLIFE RESOURCES COMMISSION BY:

Charles R Fullwood 12-16-02

name and title Exec. Director

NORTH CAROLINA, COUNTY OF Wake

I, BeLinda Carroll LeQuire a Notary Public of Wake County do hereby certify that Charles R. Fullwood, Executive Director, 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 16 day of December, 2002.

BeLinda Carroll LeQuire
Notary Public

My Commission Expires: September 26, 2006

WAKE COUNTY

The foregoing Certificate(s) of _____
certified to be correct. This instrument and this certific
Book and Page shown on the first page hereof. This

Register of Deeds For Ashe County

BY: _____
Deputy/Assistant Register of Deeds

NORTH CAROLINA - ASHE COUNTY

The foregoing certificate (s) of Anthony A. Adams, Neal O. Strickland and BeLinda Carroll LeQuire, all Notaries Public as Stated

(are) certified to be correct. Duly registered this date and hour as shown on the first page hereof.

SHIRLEY B. WALLACE
Register of Deeds

By Maude L. Goodman
~~Assistant~~ / Deputy

"EXHIBIT A"

CONSERVATION EASEMENT NO. 1, CONSERVATION EASEMENT NO. 2 AND CONSERVATION EASEMENT NO. 3 – PARCEL #703WM – JONATHAN F. AND HOLLIS M. H. WILD

The conservation easement area shown as **Conservation Easement No. 1, Conservation Easement No. 2 and Conservation Easement No. 3** of **Parcel #703WM** of **Jonathan F. and Hollis M. H. Wild**, being more particularly shown and described on a plat entitled Survey of Conservation Easement and being recorded in **Plat Book 006 Page 093** of the Ashe County Registry.

"EXHIBIT B"

ARTICLE I. DURATION OF EASEMENTS; ACCESS

B. Temporary Access Easement

The NCDOT, and authorized representatives of the WRC shall have the right to go upon the property of the grantor(s), as referred to within this document, to the extent necessary to implement the work shown and described in the properties Conceptual Restoration Plan, Exhibit C and being more particularly shown and described on a plat entitled Survey of Conservation Easement and being recorded in **Plat Book 006 Page 093** of the Ashe County Registry.

C. Permanent Access Easement

A permanent Access Easement does not apply to this property.