2003 Monitoring Report for the Miller et al. Mitigation Site on Meat Camp Creek, Watauga County

Prepared for the

North Carolina Department of Transportation Stream Mitigation Program

Transportation Improvement Project R-529

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This 2003 monitoring report 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 is required by the North Carolina Division of Water Quality (DWQ). The purpose of this report is to summarize the 2003 monitoring data collected from 652 linear feet of Meat Camp Creek located on the Miller et al. Property, Watauga County (Figure 1). Mickey and Scott (2002) described pre-construction survey methods, site conditions, and project objectives. Monitoring data was compared with data submitted in the 2003 as-built report (Mickey and Hining 2003).

Site Improvements

Channel Modifications

The first year monitoring survey was completed on October 21, 2003 and included longitudinal profile, pebble count, and five channel cross-sections. The longitudinal profile has remained stable since the as-built survey (Figure 2). A total of 14 structures (2 rock weirs, 11 rock vanes and one log vane) were constructed (Table 1) with approximate locations shown on the longitudinal profile (Figure 2). The pre-construction and post construction riffle D-50's were 45 mm and 46.6 mm (coarse gravel) (Mickey and Hining 2003), respectively. The monitoring pebble count D-50 was 37.2 mm (Figure 3). While the monitoring D-50 was slightly smaller than the post and as-built D-50, it is still in the coarse gravel range. The five cross-sections have remained stable since construction and have experienced very little change since the as-built survey (Figures 4.1-4.5).

Riparian Improvements

A total of 177 live stakes and bare root nursery trees were planted on March 17, 2003 (Table 2). Plantings included tag alder *Alnus serrulata*, silky dogwood *Cornus amomum*, silky willow *Salix sericea*, black walnut *Juglans nigra*, and black locust *Robina pseudoacacia* . Due to the small size of the plantings and high weed growth at the time of the monitoring survey, a survival count of live stakes and bare root nursery stock was not conducted. A vegetation count will be conducted during March of 2004.

Livestock Exclusion

The livestock exclusion plan, two water tanks and fencing, is functioning as planned. Livestock are no longer drinking from Meat Camp Creek or two small spring seeps located on the Miller property.

Conclusion

Since construction in September 2002, the Meat Camp Creek mitigation site has remained stable. Rock weirs, rock and log vanes are functioning as planned and have created more stable

streambanks at this location. Water quality should be improved through reduced sedimentation from eroding streambanks and exclusion of livestock from the riparian zone. In-stream habitat for fish and aquatic invertebrates has been increased with the installation of rock weirs, rock and log vanes and root wads. The second year of monitoring will be conducted during October/November 2004.

References

Mickey, J. H. and S. S. Hining. 2003. As-built report for the Meat Camp Creek mitigation site, Watuaga County. North Carolina Wildlife Resources Commission, Raleigh.

Mickey, J. H. and S. Scott. 2002. Stream restoration plan, Miller site, Meat Camp Creek, Watuaga County. North Carolina Wildlife Resources Commission, Raleigh.

FIGURE 1. Location of the Miller et al. mitigation site on Meat Camp Creek, Watauga County, October 2003.

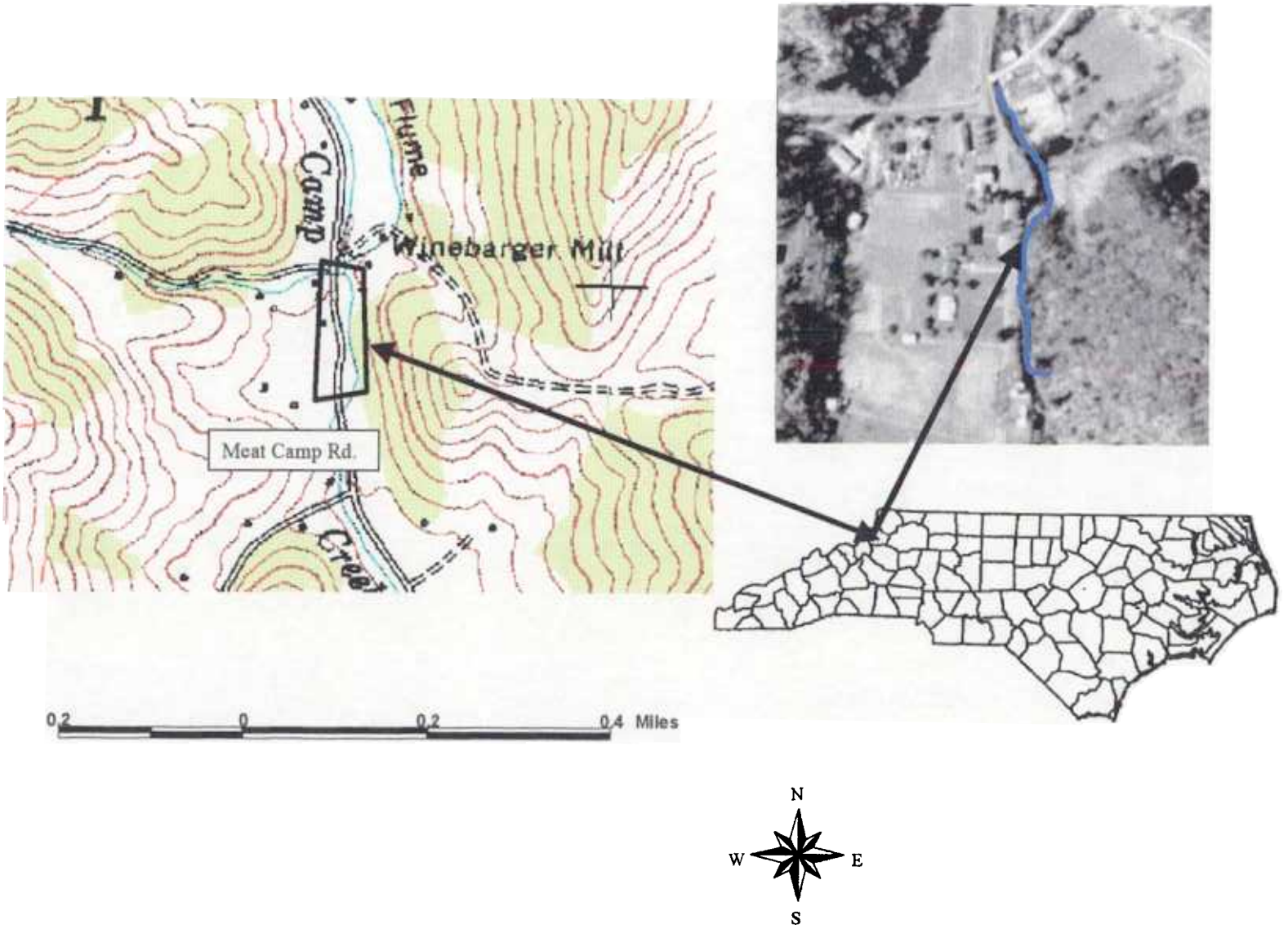


FIGURE 2. Longitudinal profile comparisons at the Miller et al. mitigation site on Meat Camp Creek mitigation site, Watauga County, October 2003.

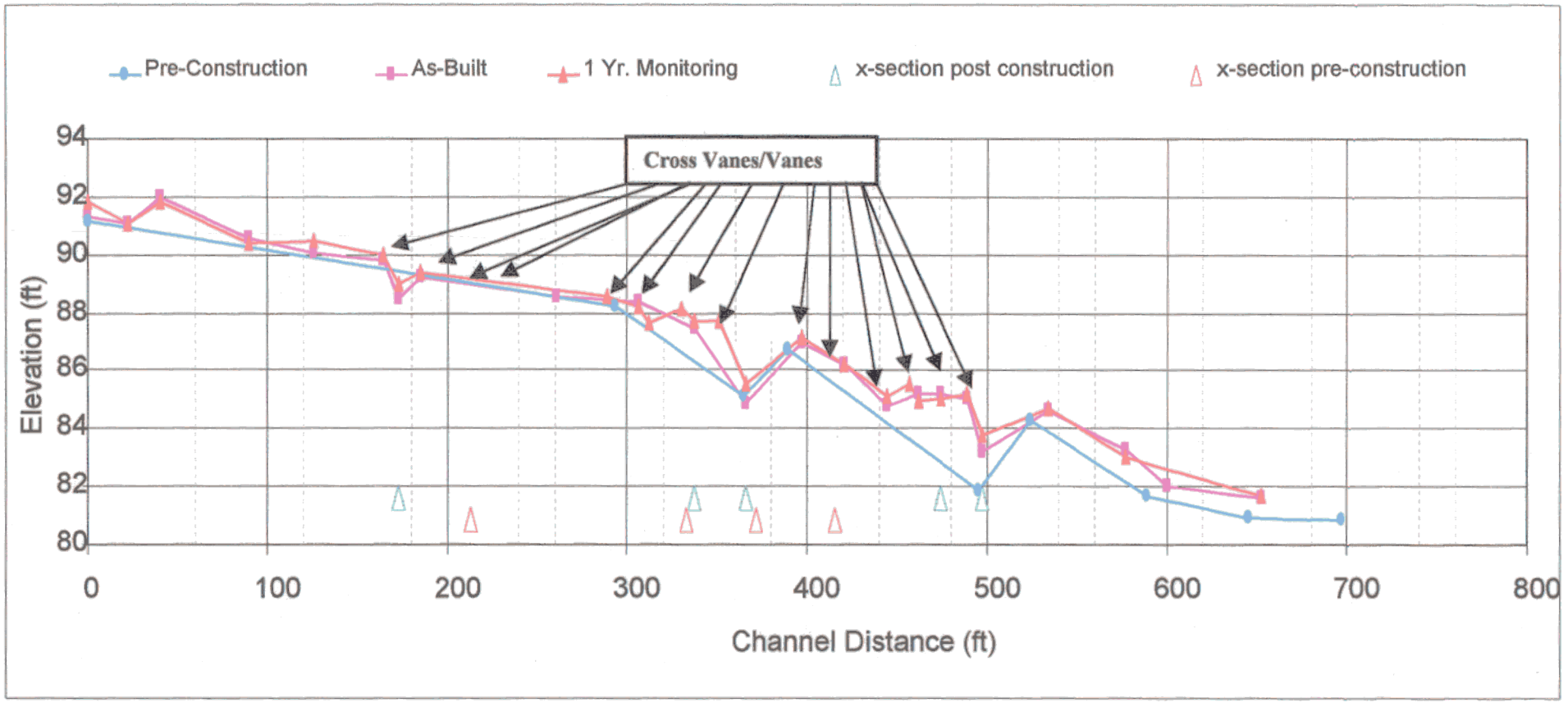


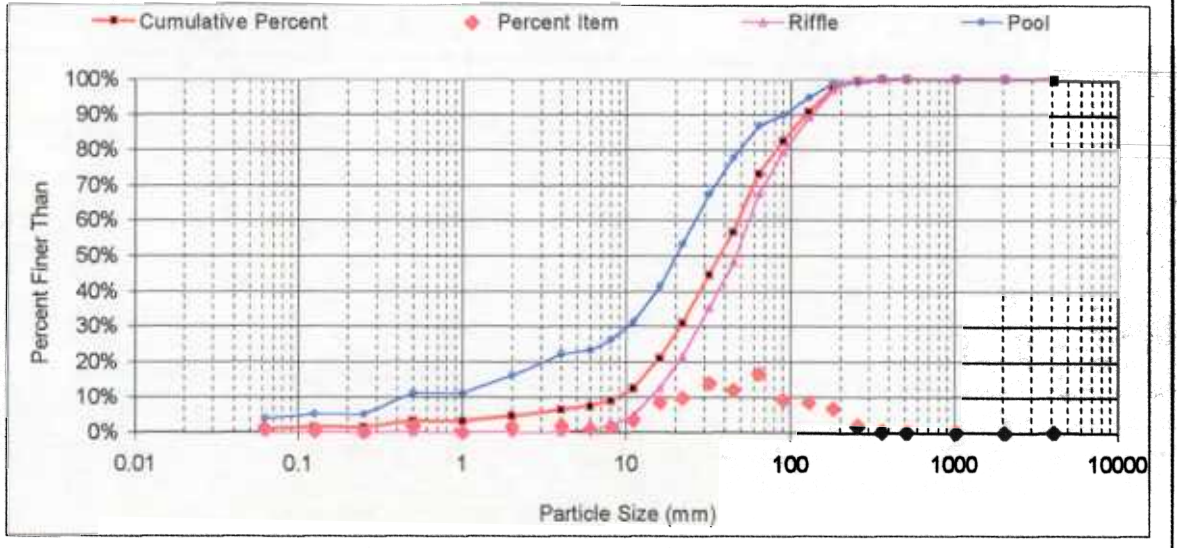
FIGURE 3. Pebble count summary at the Miller et al. mitigation site on Meat Camp Creek, Watauga County, October 2003.

Weighted Pebble Count

Percent Riffle:	71	Percent Run:	
Percent Pool:	29	Percent Glide:	

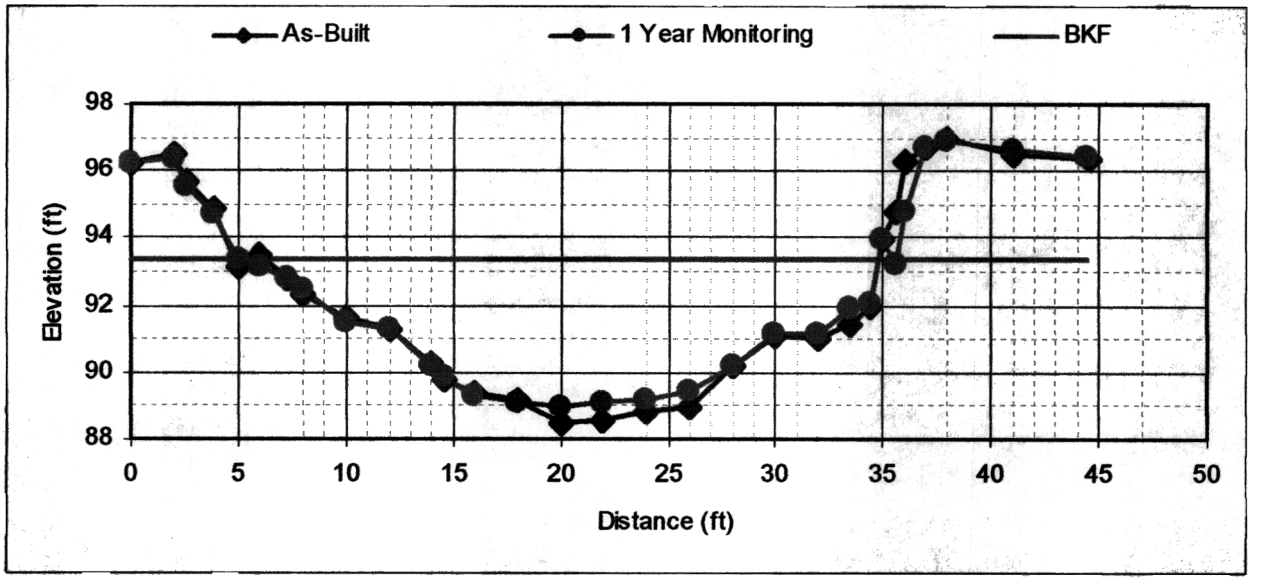
Material	Size Range (mm)		Total #
silt/clay	0	0.062	1.2
very fine sand	0.062	0.13	0.3
fine sand	0.13	0.25	0.0
medium sand	0.25	0.5	1.8
coarse sand	0.5	1	0.0
very coarse sand	1	2	1.5
very fine gravel	2	4	1.8
fine gravel	4	6	1.0
fine gravel	6	8	1.6
medium gravel	8	11	3.6
medium gravel	11	16	8.5
coarse gravel	16	22	9.8
coarse gravel	22	32	13.8
very coarse gravel	32	45	12.0
very coarse gravel	45	64	16.6
small cobble	64	90	9.2
medium cobble	90	128	8.4
large cobble	128	180	6.7
very large cobble	180	256	2.1
small boulder	256	362	0.3
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:			100
True Total Particle Count:			201

Meat Camp Creek
South Fork New River
Meat Camp
Note:



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
12.801	24.62	37.2	96	158	1%	4%	69%	26%	0%	0%

FIGURE 4. Five cross-sections at Miller et al. mitigation site on Meat Camp Creek, Watauga County, October 2003. Figures 4.1 - 4.3 were surveyed from left to right bank looking downstream; pictures were taken looking upstream. Pictures for figures 4.4 - 4.5 were taken from station 0+65 looking to station 0+0.



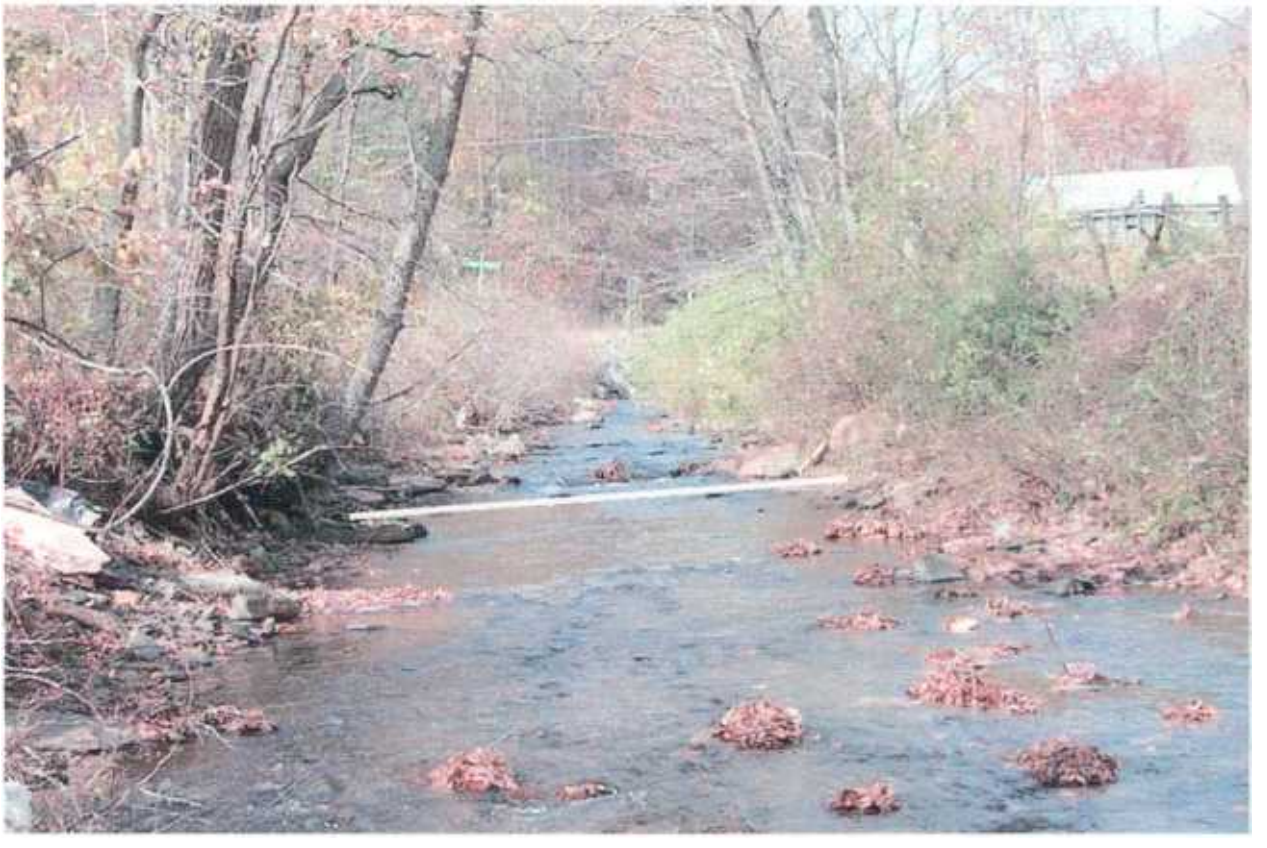


FIGURE 4.1. Cross-section at station 1+73, fast pool at rock weir.

FIGURE 4. Continued.

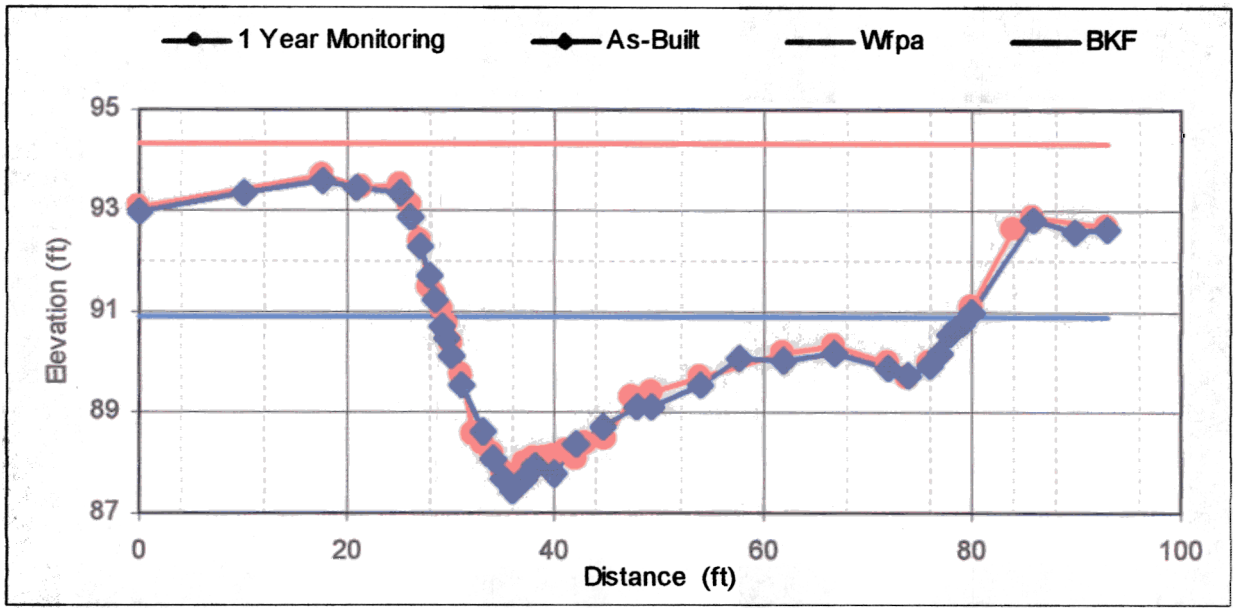


FIGURE 4.2. Cross-section at station 3+37, riffle.

FIGURE 4. Continued.

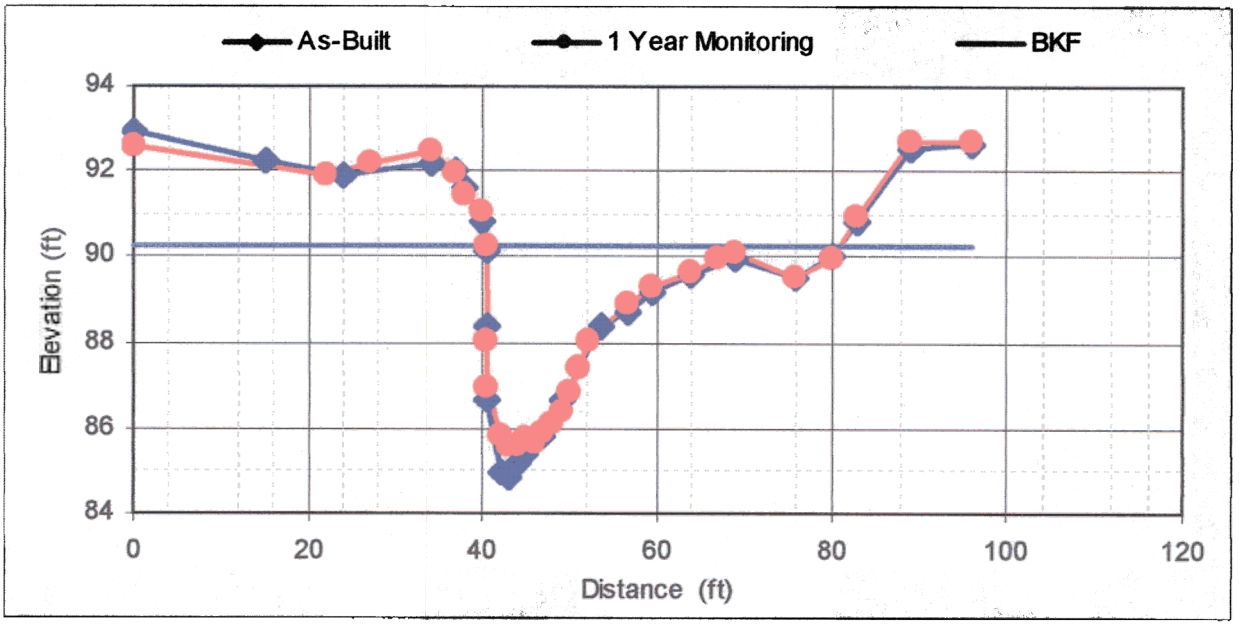


FIGURE 4.3. Cross-section at station 3+66, pool.

FIGURE 4. Continued.

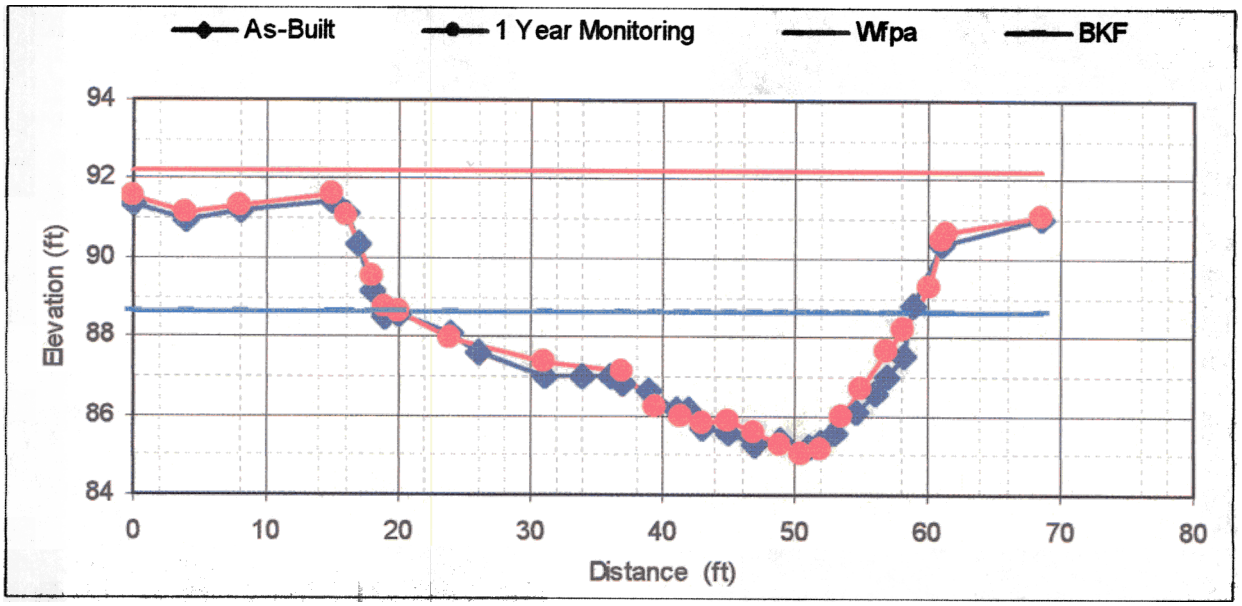


FIGURE 4.4. Cross-section at station 4+74, riffle.

FIGURE 4. Continued.

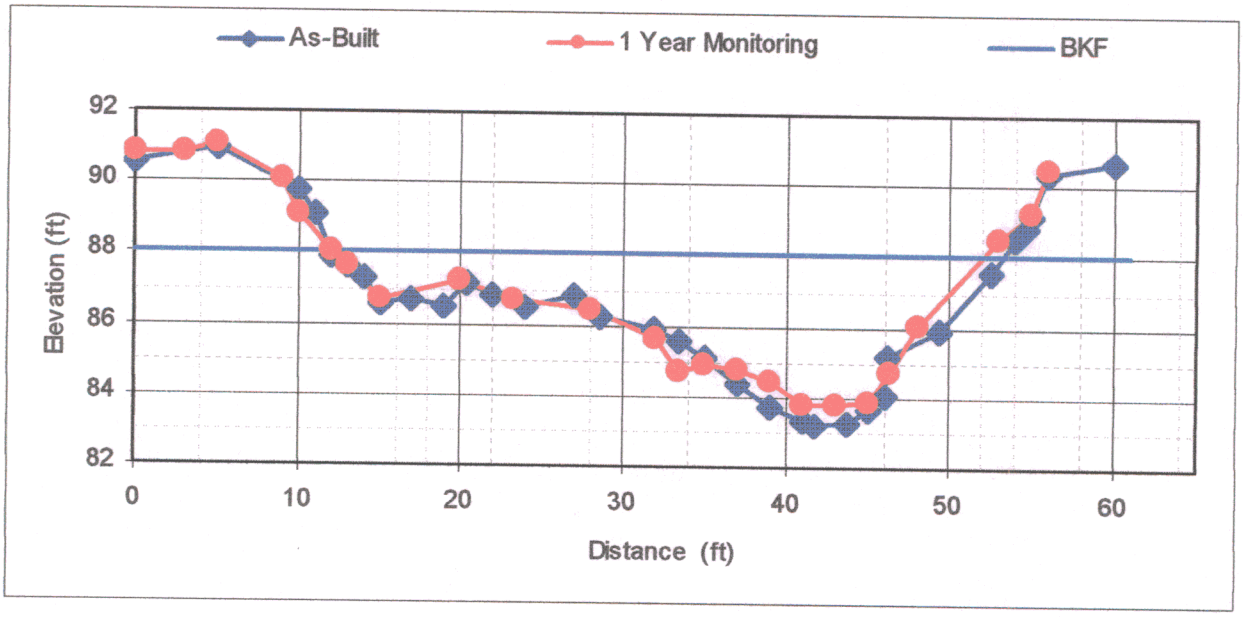


FIGURE 4.5. Cross-section at station 4+97, pool.

TABLE 1. Type and location of in-stream structures installed at the Miller et al. site, Meat Camp Creek, Watauga County, 2002.

Structure Type	Longitudinal Profile Station Number
Rock weir	1+64
Rock vane	1+89 RB[1]
Rock vane	2+10 RB
Rock vane	2+28 RB
Rock vane	2+89 LB[2]
Rock vane	3+06 LB
Rock vane	3+30 LB
Rock vane	3+51 LB
Log vane	3+97 LB
Rock vane	4+15 RB
Rock vane	4+38 RB
Rock vane	4+57 RB
Rock vane	4+70 RB
Rock weir	4+89

[1] RB - right bank
[2] LB - left bank

TABLE 2. Plantings along Meat Camp Creek at the Miller et al. site, Watuaga County, March 12, 2003.

Species	Scientific name	Number planted
Silky willow	*Salix sericea*	136
Black locust	*Robina pseudoacacia*	26
Black walnut	*Juglans nigra*	5
Tag alder	*Alnus serrulata*	10
	Total	177