Tables found in the Pigg River, Poplar Branch, Fryingpan Creek, and Beaverdam Creek Implementation Plan

Agricultural Control Measures

Excluding livestock from streams and establishing vegetated streamside buffers helps prevent streambank erosion and traps sediment from eroding pastures before it enters the stream. As a co-benefit, livestock exclusion fencing also provides bacteria reductions in direct deposition from livestock. Consequently, this plan includes recommendations for livestock exclusion/riparian buffer practices implemented in conjunction with improved pasture management.

Table 5-4. Livestock exclusion needed to achieve reduction of sediment and bacteria load from livestock direct deposition.
Assumes one exclusion system averages 2,000 linear feet of stream fencing.

Sub-watershed	Fencing needed	SL-6N or WP-2N (10 – 25 ft buffer): 10%		SL-6W, SL-6F, WP-2W or CRSL-6 (35 – 50 ft buffer): 90%	
	feet	feet	systems	feet	systems
Pigg River	16,426	1,643	1	14,783	7
Poplar Branch	450	0	0	450	1
Fryingpan Creek	0	0	0	0	0
Beaverdam Creek	45,409	4,541	2	40,868	20
Total	**62,285**	**6,184**	**3**	**56,101**	**28**

Land Based Agricultural BMPs

To meet the sediment reductions outlined in the TMDLs, best management practices to treat land-based sources of sediment must also be included in implementation efforts. Table 5-5 provides a summary of land based agricultural BMPs by watershed needed to achieve water quality goals.

BMP (Cost-share code in parenthesis)	Pigg River	Poplar Branch	Fryingpan Creek	Beaverdam Creek
	Acres (unless otherwise noted)			
Pasture				
Extension of Watering and Grazing Management System (SL-7)	2 systems	2 systems	2 systems	2 systems
Improved Pasture Management (SL-10)	605	63	289	864
Forest Riparian Buffers (DOF-RFFL, FR-3)	12 acres treated	0	20 acres treated	18 acres treated
Afforestation of Erodible Pasture (FR-1)	28	7	48	38
Permanent Vegetative Cover on Critical Areas (SL-11)	0.9	0.2	0.8	1.4
Sediment Retention, Erosion, or Water Control Structure (WP-1)	0	30	219	0
Hayland				
Forest Riparian Buffers (DOF-RFFL, FR-3)	29 acres treated	13 acres treated	0	0
Afforestation of Hayland (FR-1)	2	1	0	0
Cropland				
Forest Riparian Buffers (FR-3, DOF-RFFL)	0	30 acres treated	0	0
Continuous No Till (SL-15A)	154	28	57	0
Cover Crop (SL-8B, SL-8H, SL-8M)	154	28	57	0
Conversion from High Till to Low Till	0	4	128	0
Long Term Vegetation on Cropland (SL-1)	25	2	2	0

Table 5-5. Land based agricultural BMPs needed to achieve sediment and bacteria reduction goals.

Residential Control Measures

Residential Stormwater BMPs

A series of residential stormwater BMPs were identified to treat runoff from developed areas, turfgrass and barren areas in the watersheds (Table 5-6). Due to the largely agricultural land base of the watersheds, opportunities for residential stormwater BMPs are relatively limited.

BMP (Cost-share code in parenthesis)	Units	Pigg River	Poplar Branch	Fryingpan Creek	Beaverdam Creek
Erosion and Sediment Control in Transitional Areas	acres treated	4	0	6	0
Raingardens (RG)	system	1	1	3	1
Forest Riparian Buffers (DOF-RFFL, DOF-RT)	acres treated	0	0	0.1	2

Table 5-6. Residential stormwater BMPs needed in the implementation watersheds.

Streambank Stabilization

Streambank stabilization practices can be implemented at sites where streambanks have become incised and are actively eroding. The extent of streambank restoration called for in the watersheds is shown in Table 5-7. It is expected that most of these practices will be implemented on agricultural properties where livestock no longer have access to the stream. In some cases, bank restoration may occur in concert with livestock exclusion fencing.

BMP (Cost-share codes in parentheses)	Pigg River	Poplar Branch	Fryingpan Creek	Beaverdam Creek
	Linear Feet			
Streambank Stabilization (WP-2A)	650	0	35	1,210

Table 5-7. Streambank stabilization needed in the watersheds.

Forest Harvesting BMPs

The main source of sediment on forested lands comes from commercial forest harvesting operations. The forest harvesting BMP is a system of integrated conservation practices that are designed to prevent off-site sediment impact, protect stream crossings, and neutralize storm water runoff.

BMP (Cost-share codes in parentheses)	Pigg River	Poplar Branch	Fryingpan Creek	Beaverdam Creek
	Acres			
Woodland Erosion Stabilization (FR-4)	53	21	22	95

Table 5-8. Forest harvesting BMPs needed in the watersheds.

BMP Cost Analysis

The costs of agricultural best management practices included in the implementation plan were estimated based on data for Franklin and Bedford Counties from the VADCR Agricultural BMP Database, and the NRCS cost lists for BMP components.

Most agricultural practices recommended in the implementation plan are included in state and federal cost share programs. These programs offer financial assistance in implementing the practices and may also provide landowners with an incentive payment to encourage participation.

The total cost of livestock exclusion systems includes not only the costs associated with fence installation, repair, and maintenance, but also the cost of developing alternative water sources.

The cost of streambank restoration practices are based on natural stream channel restoration practices in similar implementation plans. Streambank stabilization and channel restoration practices are applicable to all land uses in the watersheds. Forest harvesting BMPs are needed to reduce the sediment loads in the watersheds.

Total estimated costs for implementation practices needed to meet the sediment and bacteria reduction goals are summarized in Table 6-5.

BMP Application	Pigg River	Poplar Branch	Fryingpan Creek	Beaverdam Creek	Total
Agricultural	$1,039,931	$359,512	$1,107,473	$2,346,119	$4,853,035
Residential	$5,000	$3,000	$12,175	$6,500	$26,675
Streambank restoration	$487,500	$0	$26,250	$907,500	$1,421,250
Forest harvesting	$6,890	$2,730	$2,860	$12,350	$24,830
Total Estimated Cost	**$1,539,321**	**$365,242**	**$1,148,758**	**$3,272,469**	**$6,325,790**

Table 6-5. Total BMP costs for the watersheds.