MOORES RUN
REACH 04 – FIELD DATA

Note photos 21-33 Not project related

5
1" = 50'
1"=50'
Moores Run Drive
Reach 4
Reach 5
(F)
Mowed Grass
Mowed Grass
Mowed Grass
Localized erosion from unprotected runoff
USFWS XS-C
BK#14 ▲40
BK#15 ▲41
BK#16 ▲42
BK#17 ▲43
BK#18
Concrete weakened utility line
D'
D
E
0
40
80
120
160 Feet
N
S
E
W

MOORES RUN - REACH 04

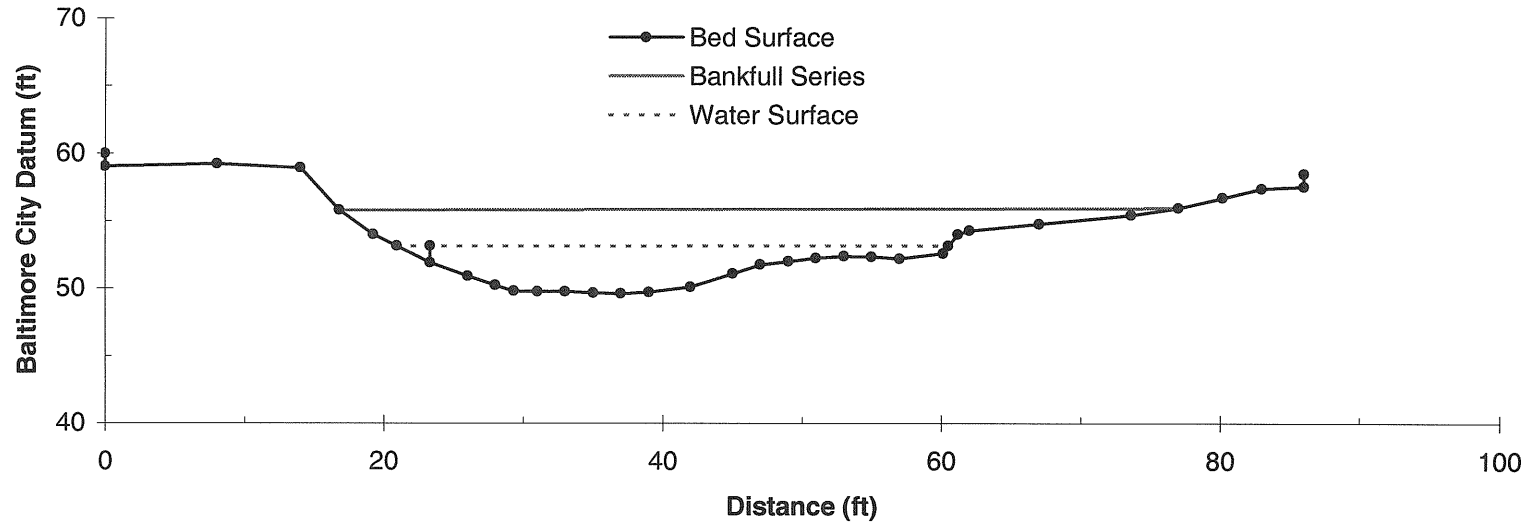
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
60.20	210.98	3.50	6.24	65.34	3.23	Bankfull
39.60	80.94	2.04	3.53	43.38	1.87	Water Surface

STREAM: Moores Run
REACH & XS: Reach 04 - USFWS XS B (Pool)
DATE: 10/02/03
CREW: FWS (RRS, KDR)
DATA: SLD
QA/QC: KR

MON. COORD.: LMON: N: 39° 19' 56.7" W: 76° 32' 08.4" (+/- 24 ft)
RMON: N: 39° 19' 56.6" W: 76° 32' 09.5" (+/- 21 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
LBMON	0.0	59.03	CS	33.0	49.76
LTMON	0.0	59.98	CS	35.0	49.68
LBMON	0.0	59.03	TW	37.0	49.59
GS	8.0	59.23	CS	39.0	49.73
FT TERR	14.0	58.93	CS	42.0	50.09
LBF	16.8	55.78	CS	45.0	51.08
CS	19.2	54.00	CS	47.0	51.74
LEW	20.9	53.11	CS	49.0	51.97
BPIN	23.3	51.90	CS	51.0	52.23
TPIN	23.3	53.14	CS	53.0	52.35
BPIN	23.3	51.90	CS	55.0	52.34
CS	26.0	50.91	CS	57.0	52.18
CS	28.0	50.22	CS	60.1	52.56
CS	29.3	49.80	REW	60.5	53.13
CS	31.0	49.76	IP	61.2	53.99

Identifier	Distance (ft)	Elevation (ft)
SL BRK	62.0	54.25
CS	67.0	54.75
SL BRK	73.6	55.41
RBF	77.0	55.93
GS	80.2	56.69
FT TERR	83.0	57.37
RBMON	86.0	57.51
RTMON	86.0	58.45

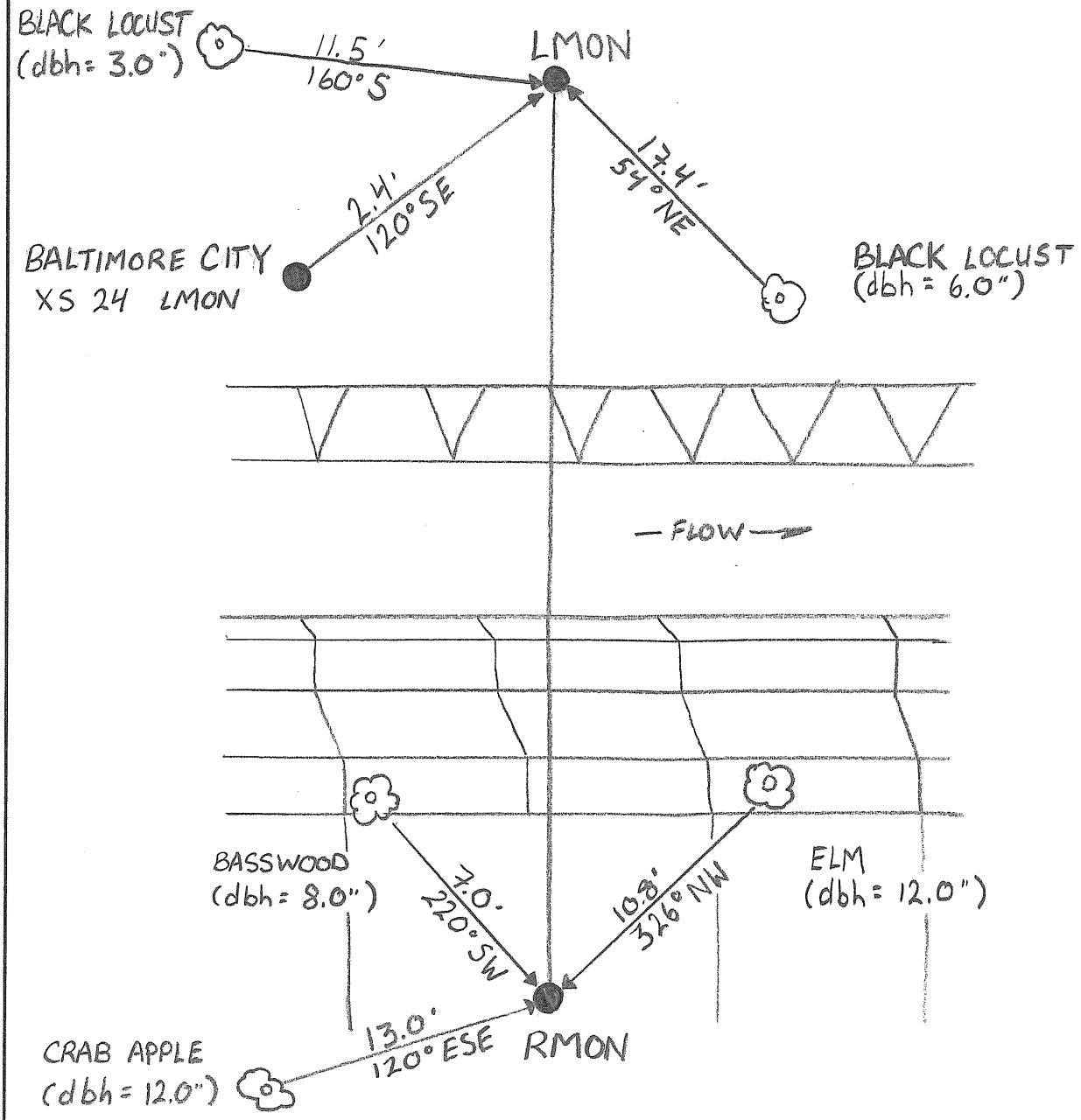


U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Cross Section
File: Reach 04 - USFWS XS B Balt. City Datum
01/29/04

Moores Run
Reach 04
USFWS Cross Section B
(Stream Feature: Pool)

Cross-Section Monument Map



• MONS = 5/8" REBAR W/YELLOW CAPS SET IN CONCRETE

MOORES RUN - REACH 04

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	CE	**Data:**	CE	**QA/QC:**	SLD	**Total Score:**	**43.58**
Reach:	04	**Comments:**	GPS Coordinates:						**Very High**
Location:	USFWS XS B		LMON: N: 39° 19' 56.7" W: 76° 32' 08.4" (+/- 24 feet)					**Notes:**	LEFT BANK
Date:	10/2/03		RMON: N: 39° 19' 56.6" W: 76° 32' 09.5" (+/- 21 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio

Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
7.03	3.88	1.81	7.01	High	

Root Depth / Bank Height Ratio

Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
2.00	7.03	0.28	6.07	High	

Weighted Root Density

Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
7.00	0.28	1.99	10.00	Extreme	

Bank Angle

Bank Angle (°)		Index	Bank Erosion Potental	Notes
76.00		5.50	Moderate	

Surface Protection

Surface Protection (%)		Index	Bank Erosion Potental	Notes
5.00		10.00	Extreme	
		Adjustment		Notes
Bank Materials		5.00		
		Adjustment		Notes
Bank Stratification		0.00		
	TOTAL SCORE	**43.58**		

Bank Erosion Potential

		Very Low	Low	Moderate	High	Very High	Extreme
Erodibility Variables							
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

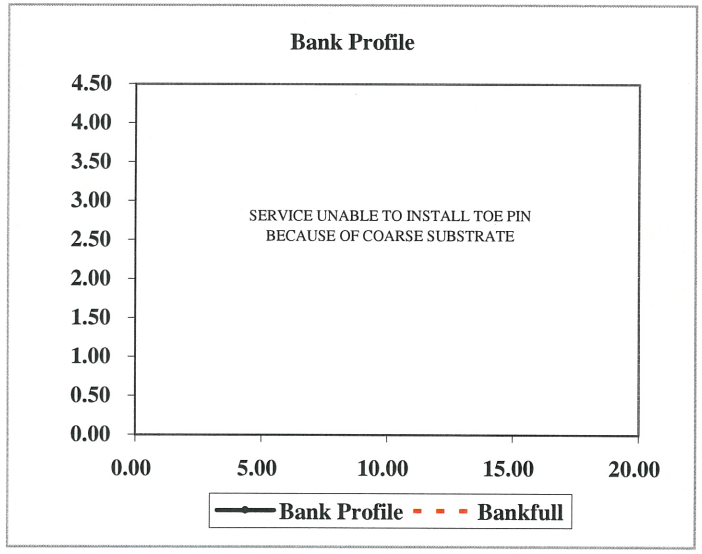
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

Horizontal Distance	Vertical Height	Notes
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		

Bankfull

Horizontal Distance	Vertical Height	Notes



MOORES RUN - REACH 04

MODIFIED PFANKUCH STREAM REACH INVENTORY AND CHANNEL STABILITY EVALUATION

Stream:	Moores Run	**Observer(s):**	TLM	**Ex. Stream Type:**	C **Ref. Stream Type:** C4
Reach:	4	**Comments:**		**Grand Total:**	66.00
Location:	Baltimore City, MD			**Stability Rating:**	Good
Date:	10/8/03			**Notes:**	

Location	Key	Category	Excellent			Good			Fair			Poor		
			Description	Rating	Score	Description	Rating	Score	Description	Rating	Score	Description	Rating	Score
Upper Banks	1	Landform Slope	Bank slope gradient < 30%.	2		Bank slope gradient 30-40%.	4	3	Bank slope gradient 40-60%.	6		Bank slope gradient > 60%.	8	
	2	Mass Wasting	No evidence of past or furture mass wasting.	3		Infrequent. Mostly healed over. Low future potential.	6	5	Frequent or large, causing sediment nearly year long.	9		Frequent or large, causing sediment nearly year long OR imminent danger of same.	12	
	3	Debris Jam Potential	Essentially absent from immediate channel area.	2		Present, but mostly small twigs and limbs.	4	4	Moderate to heavy amounts, mostly larger sizes.	6		Moderate to heavy amounts, predominantly larger sizes.	8	
	4	Vegetative Bank Protection	> 90% plant density. Vigor and variety suggest a deep, dense soil binding root mass.	3		70-90% density. Fewer species or less vigor suggest less dense or deep root mass.	6		50-70% density. Lower vigor and fewer species from shallow, discontinuous root mass.	9	9	< 50% density plus fewer species and less vigor indicating poor, discontinuous, and shallow root mass.	12	
Lower Banks	5	Channel Capacity	Ratio of w/d ratio to reference w/d ratio between 1.0-1.2.	1	1	Ratio of w/d ratio to reference w/d ratio between 1.2-1.4.	2		Ratio of w/d ratio to reference w/d ratio between 1.4-1.6.	3		Ratio of w/d ratio to reference w/d ratio between 1.6-1.8.	4	
			For incising channels, ratio of w/d ratio to reference w/d ratio between 0.8-1.0.	1		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.6-0.8.	2		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.4-0.6.	3		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.2-0.4.	4	
	6	Bank Rock Content	> 65% with large angular boulders. > 12" common.	2		40-65%. Mostly boulders and small cobbles 6-12".	4		20-40% with most in the 3-6" diameter class.	6		< 20% rock fragments of gravel sizes, 1-3" or less.	8	8
	7	Obstructions to Flow	Rocks and logs firmly imbedded. Flow pattern without cutting or deposition. Stable bed.	2		Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6		Frequent obstruction and deflectors cause bank erosion year long. Sediment traps full, channel migration occurring.	9	
	8	Cutting	Little or none. Infrequent raw banks < 6".	4		Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	5	Significant. Cuts 12-24" high. Root mat overhangs and sloughing evident.	12		Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16	
	9	Deposition	Little or no enlargement of channel or point bars.	4	4	Some new bar increase, mostly from coarse gravel.	8		Moderate deposition of new gravel and coarse sand on old and some new bars.	12		Extensive deposit of predominantly fine particles. Accelerated bar development.	16	
Channel Bottom	10	Rock Angularity	Sharp edges and corners. Plane surfaces rough.	1		Rounded corners and edges, surfaces smooth, flat.	2	2	Corners and edges well rounded in 2 dimensions.	3		Well rounded in all dimensions, surfaces smooth.	4	
	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1		Mostly dull, but may have < 35% bright surfaces.	2		Mixture dull and bright, *ie* . 35-65% mixture range.	3	3	Predominantly bright, > 65% exposed or scoured surfaces.	4	
	12	Cosolidation of Particles	Assorted sizes tightly packed or overlapping.	2		Moderately packed with some overlapping.	4	4	Mostly loose assortment with no apparent overlap.	6		No packing evident. Loose assortment easily moved.	8	
	13	Bottom Size Distribution	No size change evident. Stable material 80-100%.	4	4	Distribution shift light. Stable material 50-80%.	8		Moderate change in sizes. Stable materials 20-50%.	12		Marked distribution change. Stable materials 0-20%. Sand deposition.	16	
	14	Scouring and Deposition	< 5% of bottom affected by scour or deposition.	6	6	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12		30-50% affected. Deposits and scour at obstructions, constriction and bends. Some filling of pools.	18		> 50% of the bottom in a state of flux or change nearly year long.	24	
	15	Aquatic Vegetation	Abundant growth moss-like, dark green perennial. In swift water, too.	1		Common. Algae forms in low velocity and pool areas. Moss here, too.	2		Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3		Perennial types scarce or absent. Yellow-green, short term bloom may be present.	4	4
				Excellent Total	**15**		**Good Total**	**27**		**Fair Total**	**12**		**Poor Total**	**12**

Stream Type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107
Fair (Moderately Unstable)	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+
Stream Type	**D6**	**DA3**	**DA4**	**DA5**	**DA6**	**E3**	**E4**	**E5**	**E6**	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**G1**	**G2**	**G3**	**G4**	**G5**	**G6**
Good (Stable)	67-98	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Moderately Unstable)	99-125	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-126	108-120
Poor (Unstable)	126+	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	111+	111+	79+	79+	121+	121+	126+	121+

MOORES RUN
REACH 05 – FIELD DATA

Moores Run Drive
Mowed Grass
Mowed Grass
Mowed Grass
Reach 5 (F)
Reach 4 (in B)
Localized Erosion from concentrated run off
Localized erosion from concentrated runoff
USFWS XS-C
BKM 14 ▲40
BKM 15 ▲41
BKM 16 ▲42
BKM 17 ▲43
BKM 18 ▲39
BKM 18 (Con't)
Concrete weeped utility line
D
D'
E
E'
1" = 50'
1 = 50'
0
40
80
120
160 Feet
40

4

MOORES RUN - REACH 05

Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)
50.00	108.35	2.17	3.11	51.81	2.09
26.00	5.63	0.22	0.42	26.21	0.21

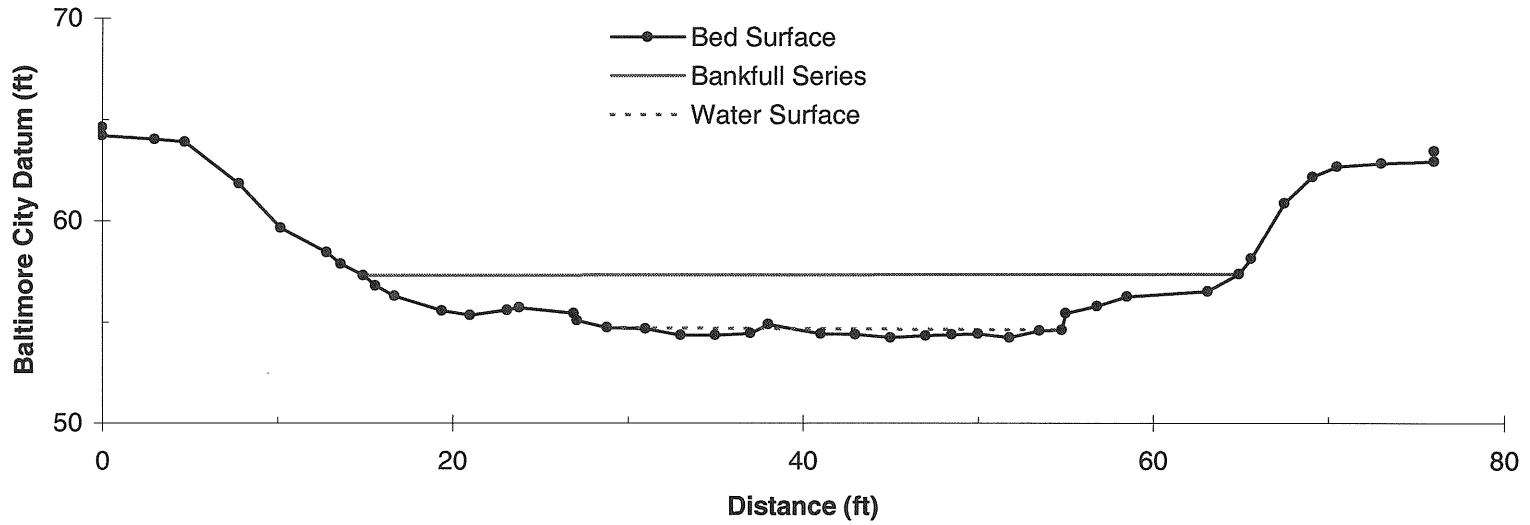
STREAM: Moores Run
REACH & XS: Reach 05 - USFWS XS C (Riffle)
DATE: 10/07/03
CREW: FWS (RRS, KDR)
DATA: SLD
QA/QC: KR

Bankfull
Water Surface

MON. COORD.: LMON: N: 39° 19' 59.0" W: 76° 32' 10.4" (+/- 24 ft)
RMON: N: 39° 19' 58.6" W: 76° 32' 10.8" (+/- 18 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
LBMON	0.0	64.20	SL BRK	23.8	55.71
LTMON	0.0	64.62	IP	26.9	55.44
LBMON	0.0	64.20	CS	27.1	55.07
GS	3.0	64.02	LEW	28.8	54.73
FT TERR	4.7	63.90	CS	31.0	54.67
GS	7.8	61.82	CS	33.0	54.35
GS	10.2	59.64	CS	35.0	54.35
GS	12.8	58.44	CS	37.0	54.44
SL BRK	13.6	57.88	CS	38.0	54.88
LBF	14.9	57.30	CS	41.0	54.42
SL BRK (SL	15.6	56.80	CS	43.0	54.39
SL BRK	16.7	56.27	CS	45.0	54.24
CS	19.4	55.57	CS	47.0	54.32
CS	21.0	55.34	CS	48.5	54.37
CS	23.1	55.59	CS	50.0	54.41

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
TW	51.8	54.23	RBMON	76.0	62.90
CS	53.5	54.57			
REW	54.8	54.61			
IP	55.0	55.42			
CS	56.8	55.79			
SL BRK	58.5	56.25			
SL BRK	63.1	56.52			
RBF	64.9	57.35			
SL BRK (SL	65.6	58.11			
GS	67.5	60.85			
GS	69.1	62.16			
FT TERR	70.5	62.64			
GS	73.0	62.80			
RBMON	76.0	62.90			
RTMON	76.0	63.42			



Path: CD Drive:\Moores Run\Data\Cross Section
File: Reach 05 - USFWS XS C Balt. City Datum
01/29/04

U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

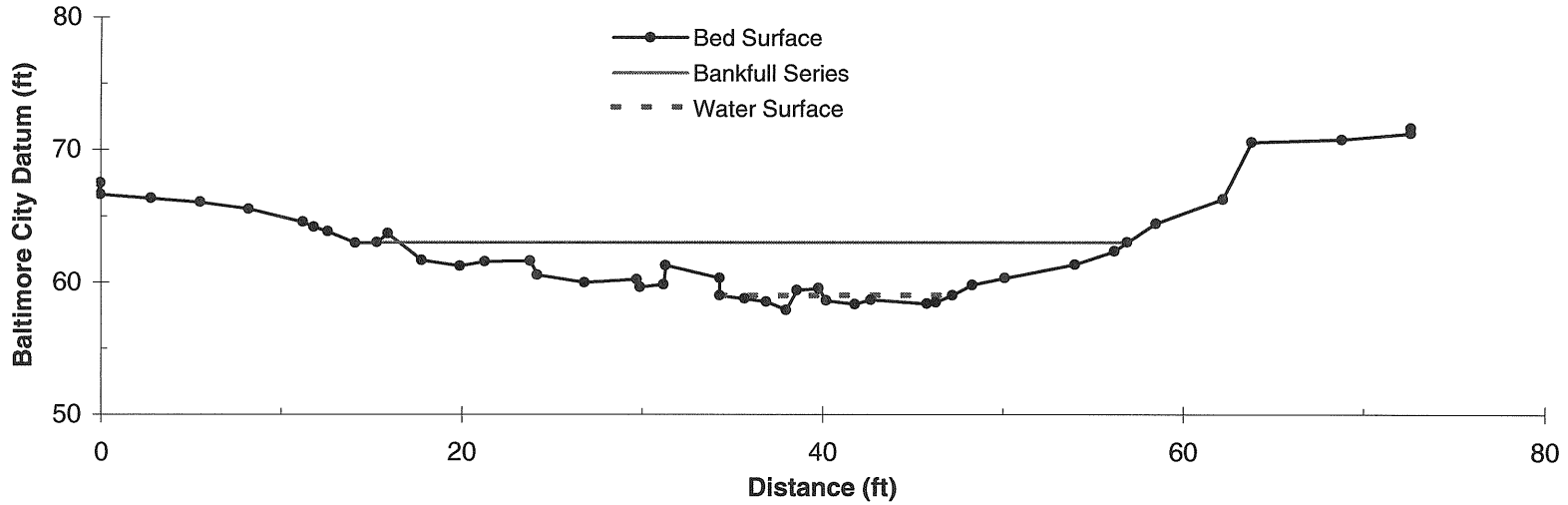
MOORES RUN - REACH 05

Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)		
41.62	113.64	2.73	5.09	49.94	2.28	Bankfull	
12.90	4.49	0.35	1.10	14.99	0.30	Water Surface	

STREAM: Moores Run
REACH & XS: Reach 05 - Balt. XS 18 (Run)
DATE: 10/03/03
CREW: FWS (MAS, KDR)
DATA: SLD
QA/QC: KR

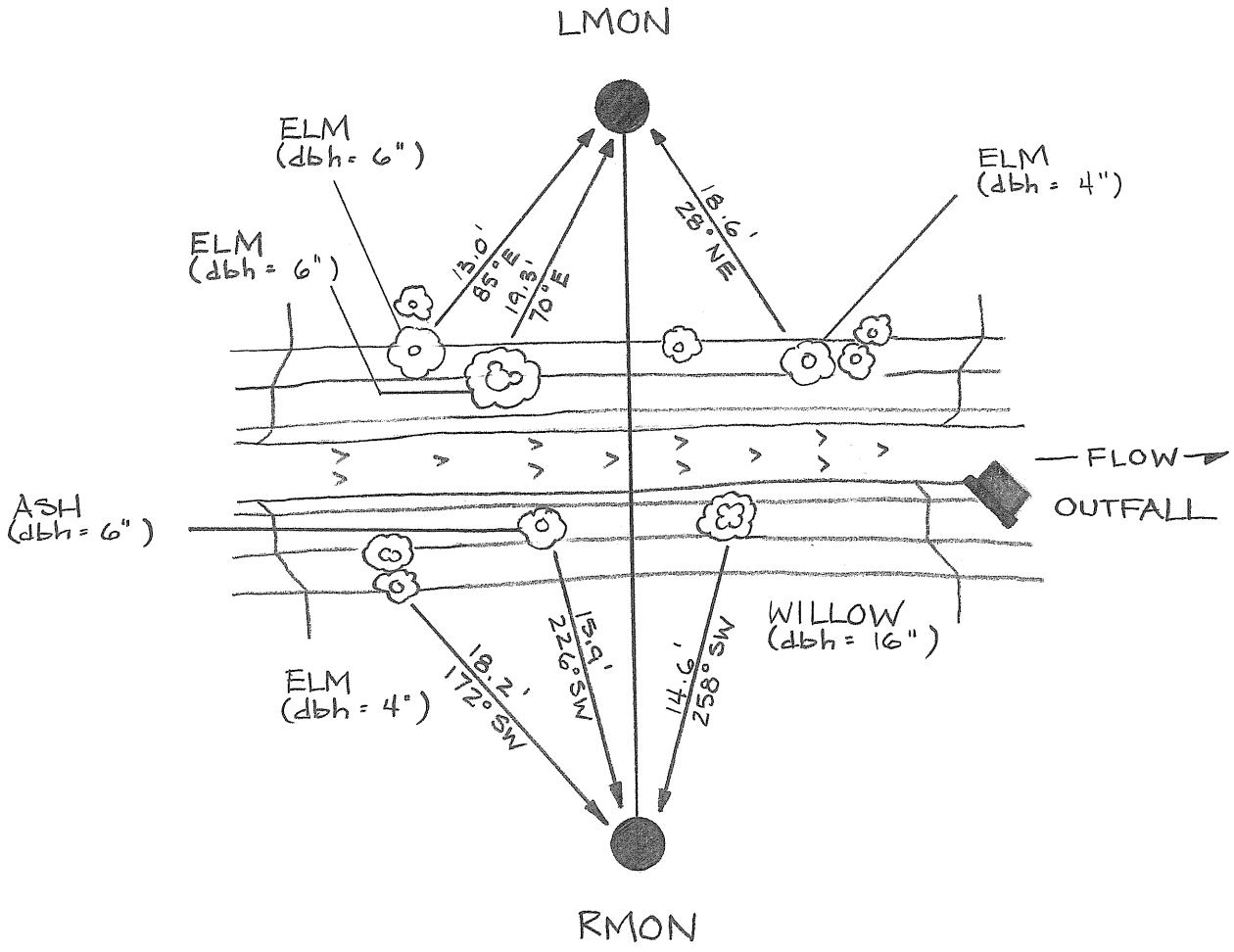
MON. COORD.: LTMON: N: 39° 20' 03.1" W: 76° 32' 14.2" (+/- 21 ft)
RTMON: N: 39° 20' 02.7" W: 76° 32' 14.9" (+/- 17 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
LBMON	-0.2	66.61	ROCK	23.8	61.60
LTMON	0.0	67.49	CS	24.2	60.54
LBMON	0.0	66.61	CS	26.8	59.97
GS	2.8	66.31	CS	29.7	60.20
GS	5.5	66.03	CS	29.9	59.62
SL BRK	8.2	65.52	CS	31.2	59.82
ROOT	11.2	64.52	BLDR	31.3	61.27
SL BRK	11.8	64.16	BLDR	34.3	60.31
SL BRK	12.6	63.81	CS	34.3	59.01
SL BRK	14.1	62.95	LEW	34.3	58.99
LBF	15.3	62.98	CS	35.7	58.74
ROCK	15.9	63.66	CS	36.9	58.53
CS	17.8	61.67	TW	38.0	57.89
CS	19.9	61.22	ROCK	38.6	59.40
CS	21.3	61.57	ROCK	39.8	59.50
CS	40.2	58.59	RBMON	72.6	71.18
CS	41.8	58.33	RTMON	72.6	71.60
CS	42.7	58.66			
CS	45.8	58.34			
CS	46.3	58.47			
REW	47.2	59.00			
IP	48.3	59.77			
SL BRK	50.1	60.29			
SL BRK	54.0	61.33			
SL BRK	56.2	62.32			
RBF	56.9	62.98			
GS	58.5	64.42			
GS	62.2	66.24			
RTOB	63.8	70.52			
GS	68.8	70.74			



Moores Run
Reach 05
USFWS Cross Section C
(Stream Feature: Riffle)

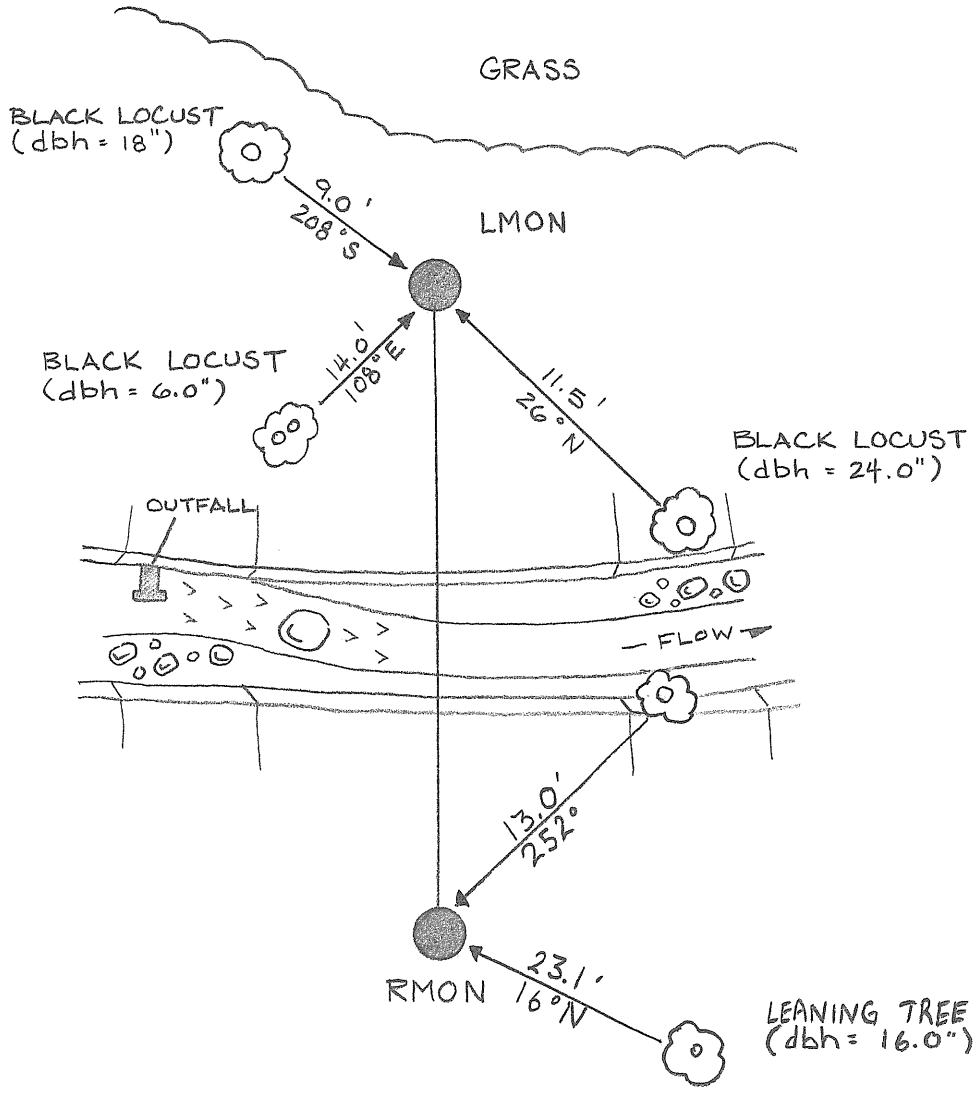
Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

Moores Run
Reach 05
Baltimore Cross Section 18
(Stream Feature: Run)

Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

MOORES RUN - REACH 05

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN	**Observer(s):**	CE/RS	**Data:**	KR	QA/QC:	SLD	**Total Score:**	**27.20**
Reach:	05	**Comments:**	GPS Coordinates:						**Moderate**
Location:	USFWS XS C		LMON: N: 39° 19' 59.0" W: 76° 32' 10.4" (+/- 24 feet)					**Notes:**	LEFT BANK
Date:	10/8/03		RMON: N: 39° 19' 58.6" W: 76° 32' 10.8" (+/- 18 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
8.83	3.00	2.94	10.00	Extreme	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
8.83	8.83	1.00	1.00	Very Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
25.00	1.00	25.00	6.54	High	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
30.00			2.44	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
20.00			7.22	High	
			Adjustment		Notes
Bank Materials			0.00		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**27.20**		

Bank Erosion Potential

Erodibility Variables		Very Low	Low	Moderate	High	Very High	Extreme
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

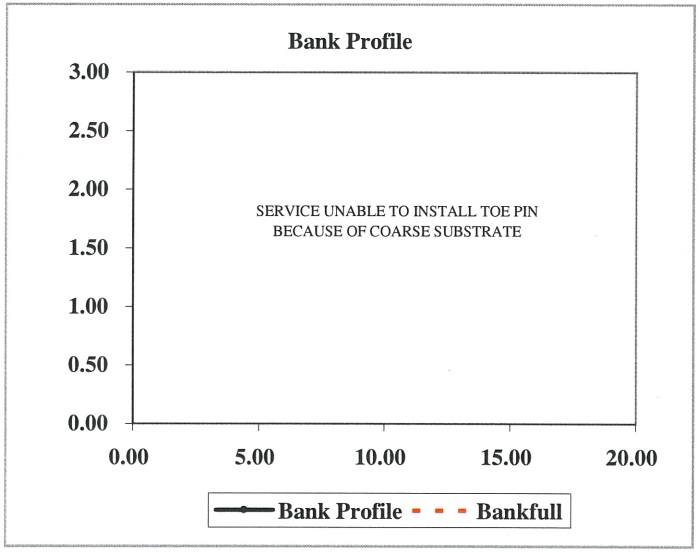
Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile		
Horizontal Distance	**Vertical Height**	**Notes**
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		
Bankfull		
Horizontal Distance	**Vertical Height**	**Notes**



MOORES RUN - REACH 05

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	RRS	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	**34.49**
Reach:	05	**Comments:**	GPS Coordinates:						**High**
Location:	USFWS XS C		LMON: N: 39° 19' 59.0" W: 76° 32' 10.4" (+/- 24 feet)					**Notes:**	RIGHT BANK
Date:	10/7/03		RMON: N: 39° 19' 58.6" W: 76° 32' 10.8" (+/- 18 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
6.50	1.50	4.33	10.00	Extreme	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
0.50	6.50	0.08	8.70	Very High	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
90.00	0.08	6.92	8.79	Very High	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
35.00			2.68	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
50.00			4.32	Moderate	
			Adjustment		Notes
Bank Materials			0.00		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**34.49**		

Bank Erosion Potential

		Very Low	Low	Moderate	High	Very High	Extreme
Erodibility Variables							
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

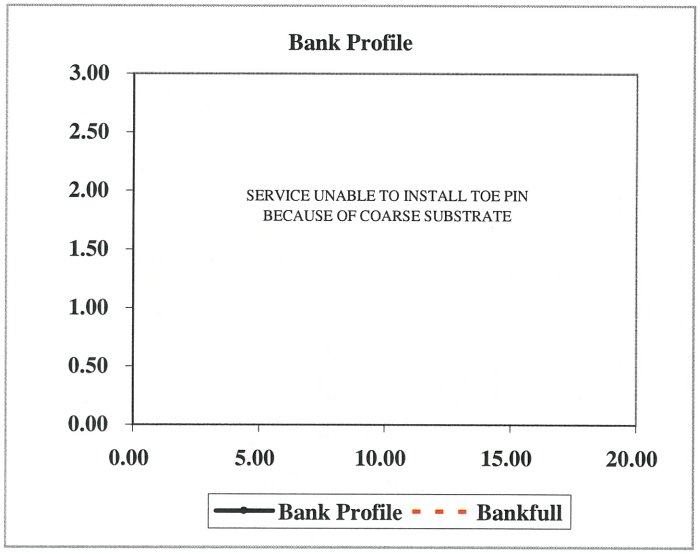
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

Horizontal Distance	Vertical Height	Notes
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		

Bankfull

Horizontal Distance	Vertical Height	Notes



MOORES RUN - REACH 05

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	MAS/KR	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	**19.22**
Reach:	05	**Comments:**	GPS Coordinates:						**Low**
Location:	BALT XS 18		LMON: N: 39° 19' 53.1" W: 76° 32' 06.6" (+/- 19 feet)					**Notes:**	LEFT BANK
Date:	10/3/03		RMON: N: 39° 19' 52.3" W: 76° 32' 07.6" (+/- 19 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
7.00	4.20	1.67	6.32	High	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
1.00	7.00	0.14	8.00	High	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
10.00	0.14	1.43	10.00	Extreme	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
25.00			2.19	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
70.00			2.71	Low	
			Adjustment		Notes
Bank Materials			(10.00)		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**19.22**		

Bank Erosion Potential

		Very Low	Low	Moderate	High	Very High	Extreme
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

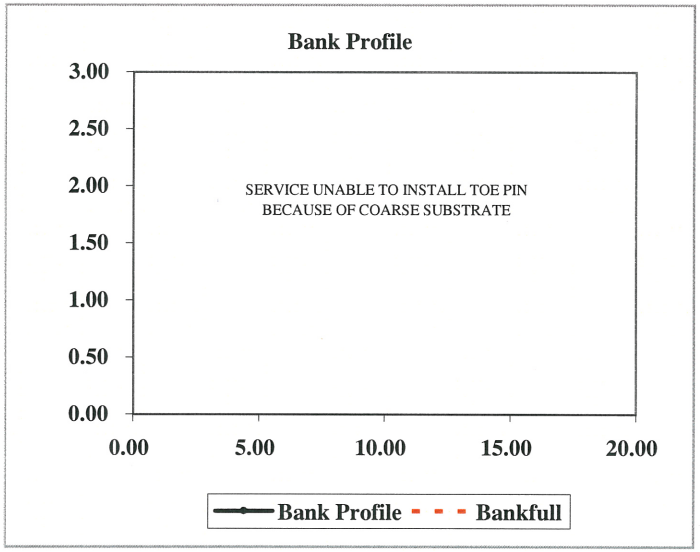
Adjustments

Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile		
Horizontal Distance	**Vertical Height**	**Notes**
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		
Bankfull		
Horizontal Distance	**Vertical Height**	**Notes**



MOORES RUN - REACH 05

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	MAS/KR	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	**24.11**
Reach:	05	**Comments:**	GPS Coordinates:						**Moderate**
Location:	BALT XS 18		LMON: N: 39° 20' 03.1" W: 76° 32' 14.2" (+/- 21 feet)					**Notes:**	RIGHT BANK
Date:	10/3/03		RMON: N: 39° 19' 52.3" W: 76° 32' 07.6" (+/- 19 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
12.00	4.50	2.67	8.81	Very High	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
1.00	12.00	0.08	8.63	Very High	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
5.00	0.08	0.42	10.00	Extreme	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
45.00			3.17	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
60.00			3.50	Low	
			Adjustment		Notes
Bank Materials			(10.00)		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**24.11**		

Bank Erosion Potential

		Very Low	Low	Moderate	High	Very High	Extreme
Erodibility Variables							
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

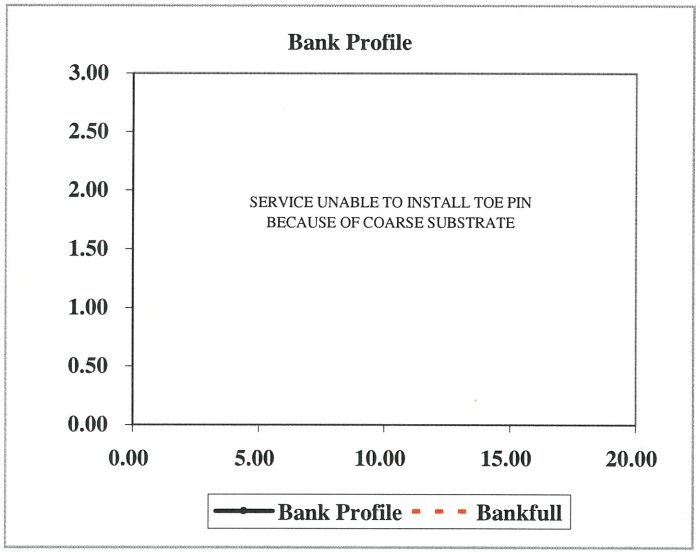
Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile		
Horizontal Distance	**Vertical Height**	**Notes**
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTATE		
Bankfull		
Horizontal Distance	**Vertical Height**	**Notes**



MOORES RUN - REACH 05

MODIFIED PFANKUCH STREAM REACH INVENTORY AND CHANNEL STABILITY EVALUATION

Stream:	Moores Run	**Observer(s):**	TLM	**Ex. Stream Type:**	F **Ref. Stream Type:** C3
Reach:	5	**Comments:**		**Grand Total:**	71.00
Location:	Baltimore City, MD			**Stability Rating:**	Good
Date:	10/8/03			**Notes:**	

Location	Key	Category	Excellent			Good			Fair			Poor		
			Description	Rating	Score	Description	Rating	Score	Description	Rating	Score	Description	Rating	Score
Upper Banks	1	Landform Slope	Bank slope gradient < 30%.	2		Bank slope gradient 30-40%.	4		Bank slope gradient 40-60%.	6		Bank slope gradient > 60%.	8	8
	2	Mass Wasting	No evidence of past or furture mass wasting.	3		Infrequent. Mostly healed over. Low future potential.	6	5	Frequent or large, causing sediment nearly year long.	9		Frequent or large, causing sediment nearly year long OR imminent danger of same.	12	
	3	Debris Jam Potential	Essentially absent from immediate channel area.	2	2	Present, but mostly small twigs and limbs.	4		Moderate to heavy amounts, mostly larger sizes.	6		Moderate to heavy amounts, predominantly larger sizes.	8	
	4	Vegetative Bank Protection	> 90% plant density. Vigor and variety suggest a deep, dense soil binding root mass.	3		70-90% density. Fewer species or less vigor suggest less dense or deep root mass.	6		50-70% density. Lower vigor and fewer species from shallow, discontinuous root mass.	9	9	< 50% density plus fewer species and less vigor indicating poor, discontinuous, and shallow root mass.	12	
Lower Banks	5	Channel Capacity	Ratio of w/d ratio to reference w/d ratio between 1.0-1.2.	1	1	Ratio of w/d ratio to reference w/d ratio between 1.2-1.4.	2		Ratio of w/d ratio to reference w/d ratio between 1.4-1.6.	3		Ratio of w/d ratio to reference w/d ratio between 1.6-1.8.	4	
			For incising channels, ratio of w/d ratio to reference w/d ratio between 0.8-1.0.	1		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.6-0.8.	2		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.4-0.6.	3		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.2-0.4.	4	
	6	Bank Rock Content	> 65% with large angular boulders. > 12" common.	2		40-65%. Mostly boulders and small cobbles 6-12".	4		20-40% with most in the 3-6" diameter class.	6	6	< 20% rock fragments of gravel sizes, 1-3" or less.	8	
	7	Obstructions to Flow	Rocks and logs firmly imbedded. Flow pattern without cutting or deposition. Stable bed.	2	2	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4		Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6		Frequent obstruction and deflectors cause bank erosion year long. Sediment traps full, channel migration occurring.	9	
	8	Cutting	Little or none. Infrequent raw banks < 6".	4		Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	5	Significant. Cuts 12-24" high. Root mat overhangs and sloughing evident.	12		Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16	
	9	Deposition	Little or no enlargement of channel or point bars.	4	4	Some new bar increase, mostly from coarse gravel.	8		Moderate deposition of new gravel and coarse sand on old and some new bars.	12		Extensive deposit of predominantly fine particles. Accelerated bar development.	16	
Channel Bottom	10	Rock Angularity	Sharp edges and corners. Plane surfaces rough.	1		Rounded corners and edges, surfaces smooth, flat.	2	2	Corners and edges well rounded in 2 dimensions.	3		Well rounded in all dimensions, surfaces smooth.	4	
	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1		Mostly dull, but may have < 35% bright surfaces.	2		Mixture dull and bright, *ie* . 35-65% mixture range.	3	3	Predominantly bright, > 65% exposed or scoured surfaces.	4	
	12	Cosolidation of Particles	Assorted sizes tightly packed or overlapping.	2		Moderately packed with some overlapping.	4	4	Mostly loose assortment with no apparent overlap.	6		No packing evident. Loose assortment easily moved.	8	
	13	Bottom Size Distribution	No size change evident. Stable material 80-100%.	4	4	Distribution shift light. Stable material 50-80%.	8		Moderate change in sizes. Stable materials 20-50%.	12		Marked distribution change. Stable materials 0-20%. Sand deposition.	16	
	14	Scouring and Deposition	< 5% of bottom affected by scour or deposition.	6		5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	12	30-50% affected. Deposits and scour at obstructions, constriction and bends. Some filling of pools.	18		> 50% of the bottom in a state of flux or change nearly year long.	24	
	15	Aquatic Vegetation	Abundant growth moss-like, dark green perennial. In swift water, too.	1		Common. Algae forms in low velocity and pool areas. Moss here, too.	2		Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3		Perennial types scarce or absent. Yellow-green, short term bloom may be present.	4	4
					Excellent Total			**Good Total**			**Fair Total**			**Poor Total**
					13			28			18			12

Stream Type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107
Fair (Moderately Unstable)	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+
Stream Type	**D6**	**DA3**	**DA4**	**DA5**	**DA6**	**E3**	**E4**	**E5**	**E6**	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**G1**	**G2**	**G3**	**G4**	**G5**	**G6**
Good (Stable)	67-98	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Moderately Unstable)	99-125	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-126	108-120
Poor (Unstable)	126+	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	111+	111+	79+	79+	121+	121+	126+	121+

MOORES RUN
REACH 06 – FIELD DATA

ARIZONA AVE
Outfalls.shp
Cross sections
Behi.shp
localized erosion from back eddie caused by walls of outfall
man hole stack 3
48" outfall
1" = 50'
BC-XS14
BK# 29
USFWS XS-D
BC-XS16
BK# 23
Erosion Gully
Reach 6
18" outfall
Match line
BK# 22
Moones Run ct
40 0 40 80 120 160 Feet
1" = 50'
3

MATCH LINE
bar w/ lots of cobble/boulder size deposition-
material made up of natural rocks & concrete.
cut off channel
w/ bedrock bed
1" = 50'
Reach 8
Reach 7 (Fn B)
Reach 6
BK#23 (con't)
52
BK#26
Low BENI from boulders
USFWS XS-E
Classification
No monuments
BK#25
Low BENI
BK#24 (con't)
MOORES Run Drive
MATCH LINE
40 0 40 80 120 160 Feet
1" = 50'
2

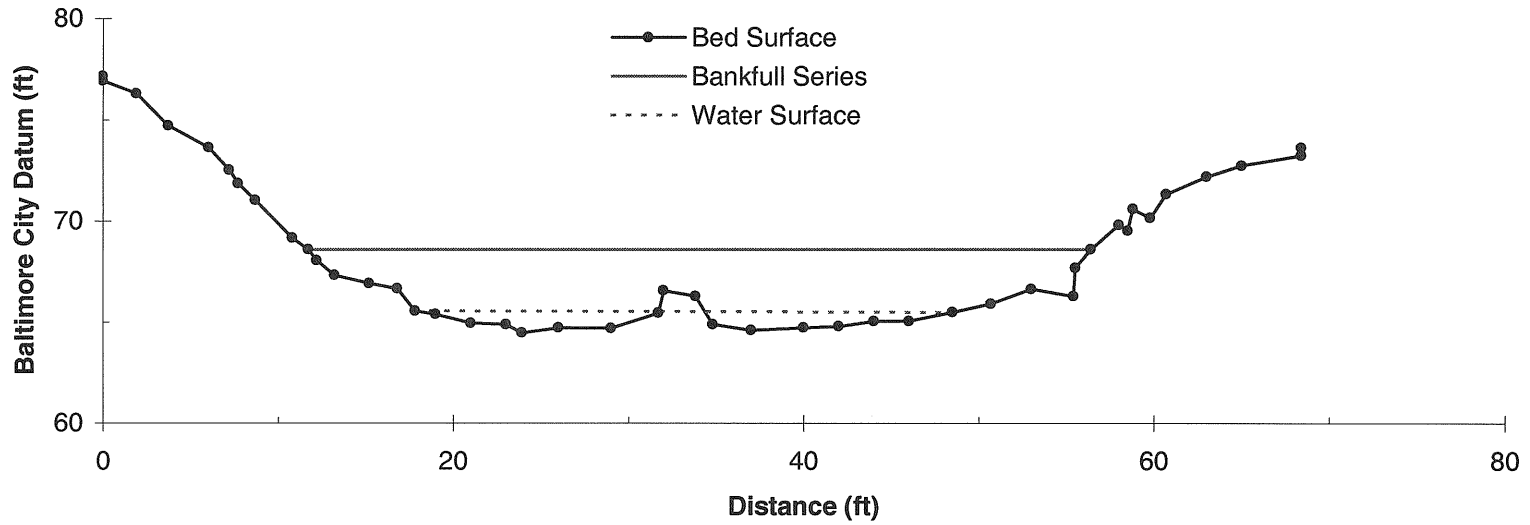
MOORES RUN - REACH 06

Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
44.70	135.93	3.04	4.12	49.51	2.75	Bankfull
30.70	14.95	0.49	1.07	32.63	0.46	Water Surface

STREAM: Moores Run
REACH & XS: Reach 06 - Balt. XS 16 (Run)
DATE: 10/07/03
CREW: FWS (RRS, KDR)
DATA: SLD
QA/QC: KR

MON. COORD.: LTMON: N: 39° 20' 04.8" W: 76° 32' 15.6" (+/- 21 ft)
RTMON: N: 39° 20' 04.8" W: 76° 32' 16.2" (+/- 18 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
LBMON	0.0	76.93	LEW	17.8	65.56
LTMON	0.0	77.17	CS	19.0	65.39
LBMON	0.0	76.93	CS	21.0	64.96
FT TERR	1.9	76.31	CS	23.0	64.90
GS	3.7	74.72	CS	23.9	64.47
GS	6.0	73.65	CS	26.0	64.73
GS	7.2	72.54	CS	29.0	64.70
GS	7.7	71.87	BLDR	31.7	65.45
GS	8.7	71.03	BLDR	32.0	66.56
SL BRK	10.8	69.17	BLDR	33.8	66.29
LBF	11.7	68.59	BLDR	34.8	64.90
SL BRK (SL	12.2	68.06	CS	37.0	64.59
SL BRK	13.2	67.32	CS	40.0	64.73
CS	15.2	66.92	CS	42.0	64.79
IP	16.8	66.65	CS	44.0	65.04
CS	46.0	65.06	RTMON	68.4	73.60
REW	48.5	65.48	RBMON	68.4	73.22
CS	50.7	65.91			
CS	53.0	66.64			
BLDR	55.4	66.28			
BLDR	55.5	67.68			
RBF	56.4	68.59			
BLDR	58.0	69.81			
BLDR	58.5	69.52			
BLDR	58.8	70.59			
GS	59.8	70.14			
BLDR	60.7	71.32			
GS	63.0	72.17			
GS	65.0	72.73			
RBMON	68.4	73.22			



U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Cross Sections
File: Reach 06 - BALT XS 16 Balt. City Datum
01/30/04

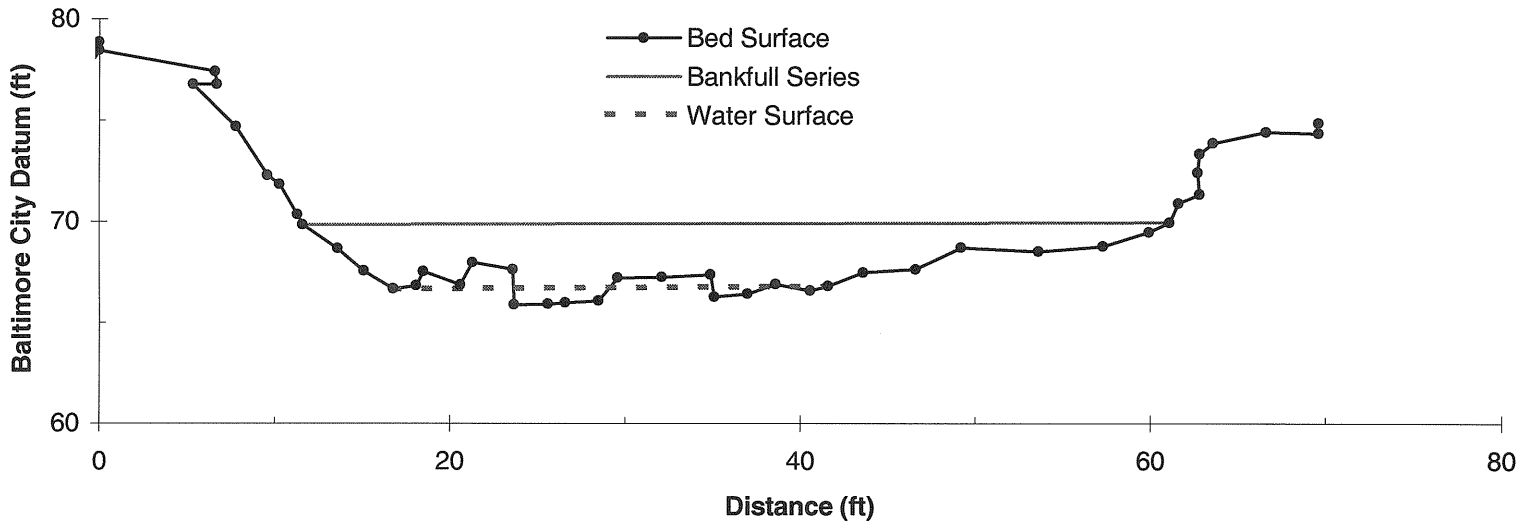
MOORES RUN - REACH 06

Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)		
49.50	114.74	2.32	4.00	55.30	2.07	Bankfull	
24.80	-2.17	-0.09	0.83	29.17	-0.07	Water Surface	

STREAM: Moores Run
REACH & XS: Reach 06 - USFWS XS D (Riffle)
DATE: 10/08/03
CREW: FWS (RRS, SLD)
DATA: SLD
QA/QC: KR

MON. COORD.: LMON: N: 39° 20' 06.1" W: 76° 32' 16.2" (+/- 18 ft)
RMON: N: 39° 20' 05.5" W: 76° 32' 17.0" (+/- 12 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
GS	-0.4	77.93	BLDR	18.1	66.81
LBMON	0.0	78.44	BLDR	18.5	67.53
LTMON	0.0	78.88	BLDR	20.6	66.87
LBMON	0.0	78.44	BLDR	21.3	67.98
LTOB	6.6	77.41	BLDR	23.6	67.63
T SCOUR	6.7	76.77	TW	23.7	65.87
UNDERCUT	5.4	76.77	CS	25.6	65.89
GS	7.8	74.67	CS	26.6	65.96
GS	9.6	72.29	CS	28.5	66.06
SL BRK	10.3	71.83	BAR	29.6	67.19
SL BRK	11.3	70.33	BAR	32.1	67.23
LBF	11.6	69.85	BAR	34.9	67.36
GS	13.6	68.66	BAR	35.1	66.26
GS	15.1	67.54	CS	37.0	66.40
LEW	16.8	66.66	CS	38.6	66.88
CS	40.6	66.56	RBMON	69.6	74.33
REW	41.6	66.79	RTMON	69.6	74.84
CS	43.6	67.47			
CS	46.6	67.63			
CS	49.2	68.69			
CS	53.6	68.49			
SL BRK	57.3	68.75			
SL BRK	59.9	69.47			
RBF	61.1	69.93			
SL BRK	61.6	70.89			
SL BRK	62.8	71.31			
UNDERCUT	62.7	72.41			
UNDERCUT	62.8	73.31			
RTOB	63.6	73.85			
GS	66.6	74.40			



U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Cross Sections
File: Reach 06 - USFWS XS D Balt. City Datum
01/29/04

MOORES RUN - REACH 06

Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)
44.12	125.09	2.84	5.13	53.21	2.35
25.27	22.91	0.91	2.02	26.59	0.86

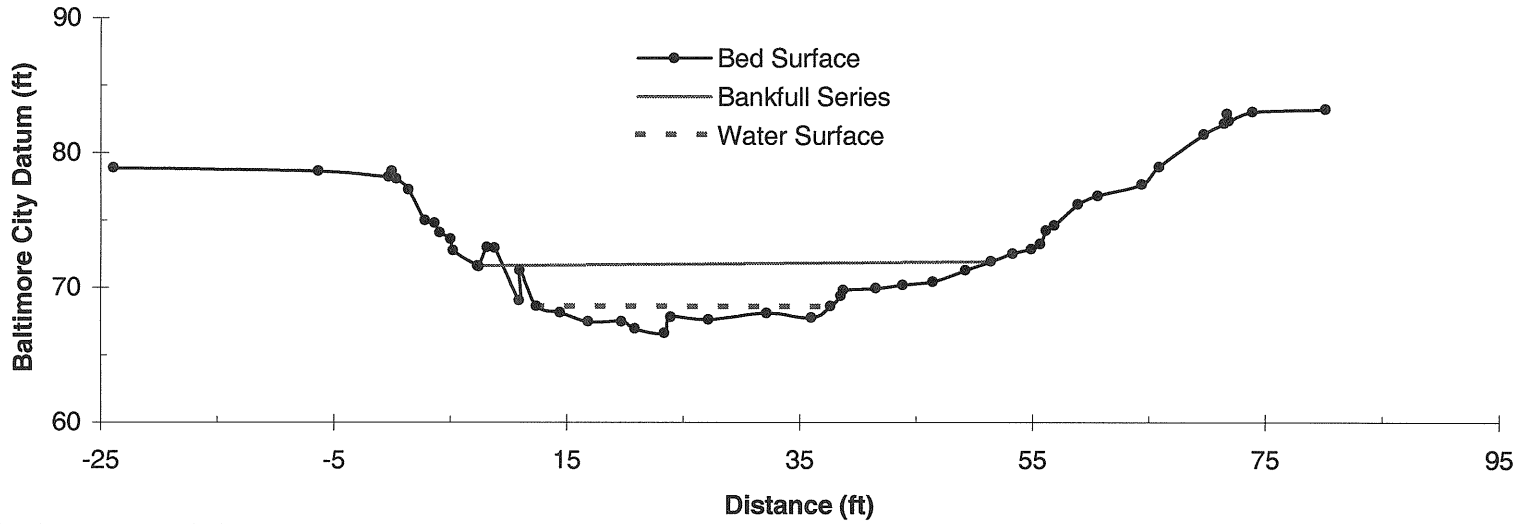
Bankfull
Water Surface

STREAM: Moores Run
REACH & XS: Reach 06 - Balt. XS 14 (Pool)
DATE: 10/07/03
CREW: FWS (CE/SD)
DATA: KR
QA/QC: SLD

MON. COORD.: LTMON: N: 39° 20' 06.9" W: 76° 32' 17.2" (+/- 23 ft)
RTMON: N: 39° 20' 06.5" W: 76° 32' 17.8" (+/- 18 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
GS	-23.9	78.87	BLDR	8.8	72.93
GS	-6.3	78.62	BLDR	10.9	69.04
LBMON	-0.3	78.23	BLDR	11.0	71.26
LTMON	0.0	78.65	LEW	12.4	68.62
LBMON	0.1	78.24	CS	14.5	68.12
LTOB	0.4	78.07	CS	16.9	67.45
SL BRK	1.4	77.25	CS	19.7	67.48
SL BRK	2.9	74.98	CS	20.9	66.93
SL BRK	3.7	74.78	TW	23.4	66.60
SL BRK	4.1	74.09	CS	23.9	67.80
SL BRK	5.1	73.59	CS	27.2	67.62
SL BRK	5.3	72.74	CS	32.2	68.10
LBF	7.3	71.62	CS	36.0	67.75
BLDR	7.5	71.56	REW	37.7	68.61
BLDR	8.2	72.99	SL BRK	38.6	69.35

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
IP	38.7	69.78	SL BRK	69.7	81.36
SL BRK	41.6	69.94	RBMON	71.5	82.16
SL BRK	43.9	70.18	RTMON	71.7	82.85
SL BRK	46.5	70.43	RBMON	71.9	82.33
SL BRK	49.2	71.25	FT TERR	73.9	82.99
RBF	51.5	71.93	GS	80.2	83.19
SL BRK	53.3	72.51			
SL BRK	54.9	72.86			
SL BRK	55.7	73.21			
SL BRK	56.2	74.21			
SL BRK	56.9	74.59			
SL BRK	58.9	76.15			
SL BRK	60.6	76.80			
SL BRK	64.4	77.63			
SL BRK	65.9	78.94			

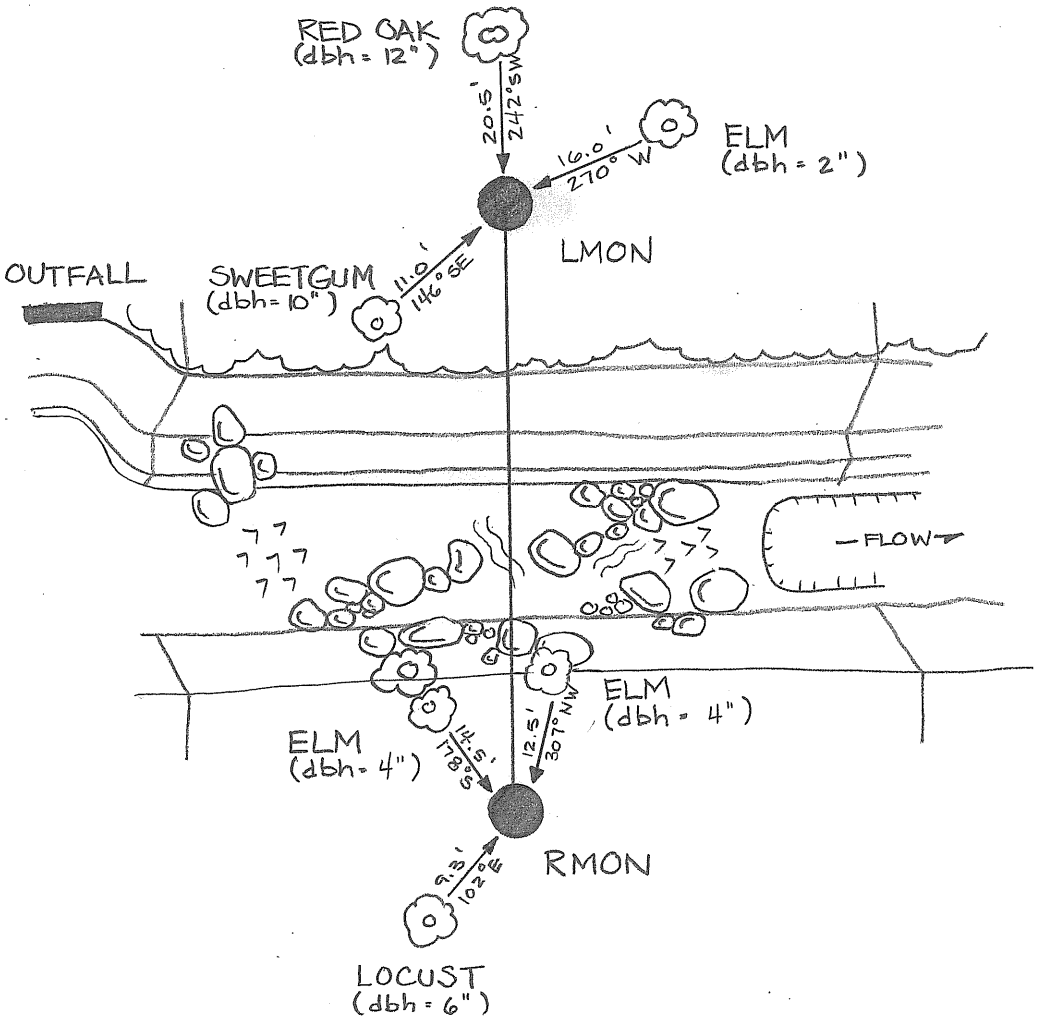


U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Cross Sections
File: Reach 06 - BALT XS 14 Balt. City Datum
01/30/04

Moores Run
Reach 06
Baltimore Cross Section 16
(Stream Feature: Run)

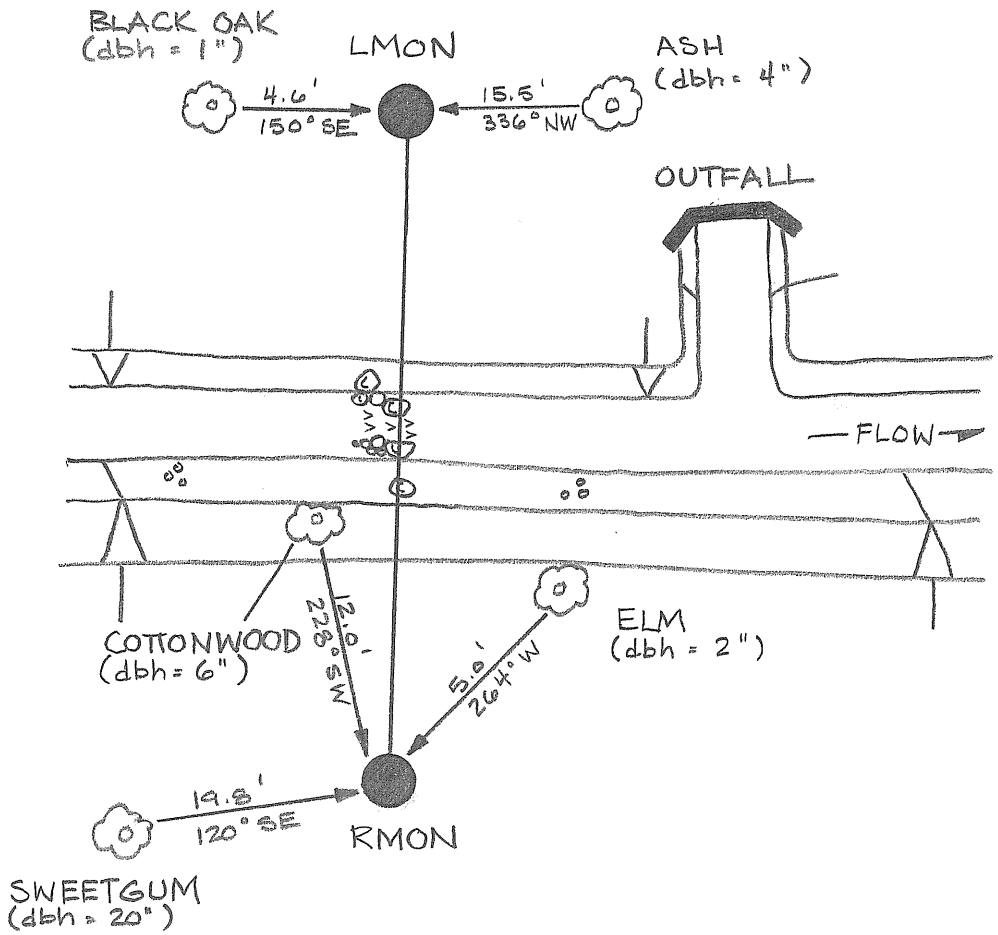
Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

Moores Run
Reach 06
USFWS Cross Section D
(Stream Feature: Riffle)

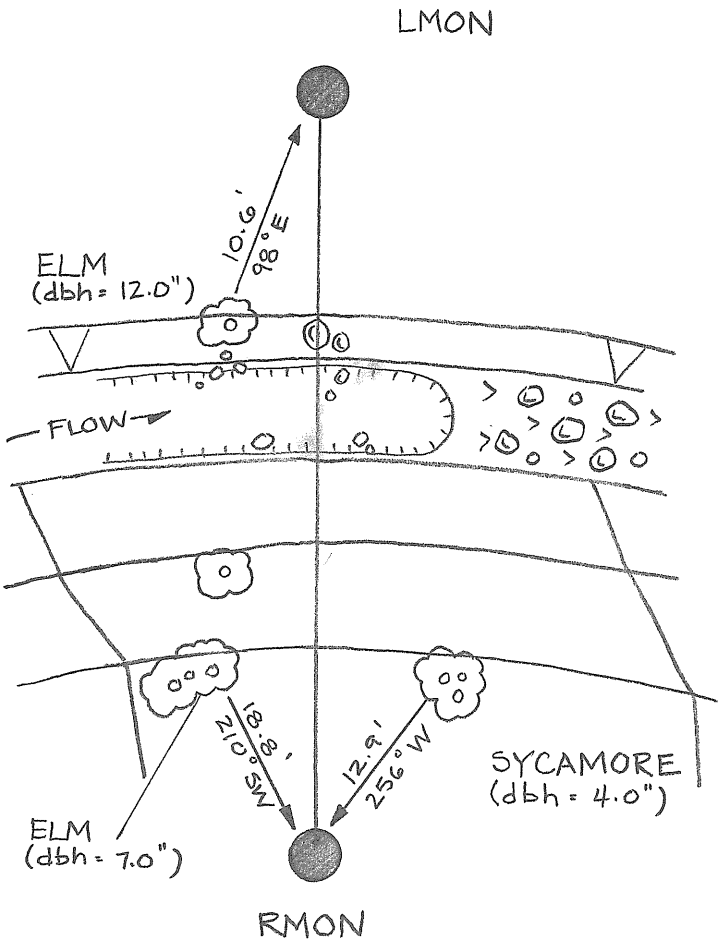
Cross-Section Monument Map



MONS = 2" CAPPED STEEL PIPES

Moores Run
Reach 06
Baltimore Cross Section 14
(Stream Feature: Pool)

Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

MOORES RUN - REACH 06

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD		RRS	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	42.72
Reach:	06	**Comments:**	GPS Coordinates:						**Very High**
Location:	BALT XS 16		LMON: N: 39° 20' 04.8" W: 76° 32' 15.6" (+/- 21 feet)					**Notes:**	LEFT BANK
Date:	10/7/03		RMON: N: 39° 20' 04.8" W: 76° 32' 16.2" (+/- 18 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio

Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
10.00	1.50	6.67	10.00	Extreme	

Root Depth / Bank Height Ratio

Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
2.00	10.00	0.20	7.22	High	

Weighted Root Density

Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
65.00	0.20	13.00	8.11	Very High	

Bank Angle

Bank Angle (°)		Index	Bank Erosion Potental	Notes
43.00		3.07	Low	

Surface Protection

Surface Protection (%)		Index	Bank Erosion Potental	Notes
50.00		4.32	Moderate	

	Adjustment		Notes
Bank Materials	5.00		
	Adjustment		Notes
Bank Stratification	5.00		
TOTAL SCORE	**42.72**		

Bank Erosion Potential

		Very Low	Low	Moderate	High	Very High	Extreme
Erodibility Variables							
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

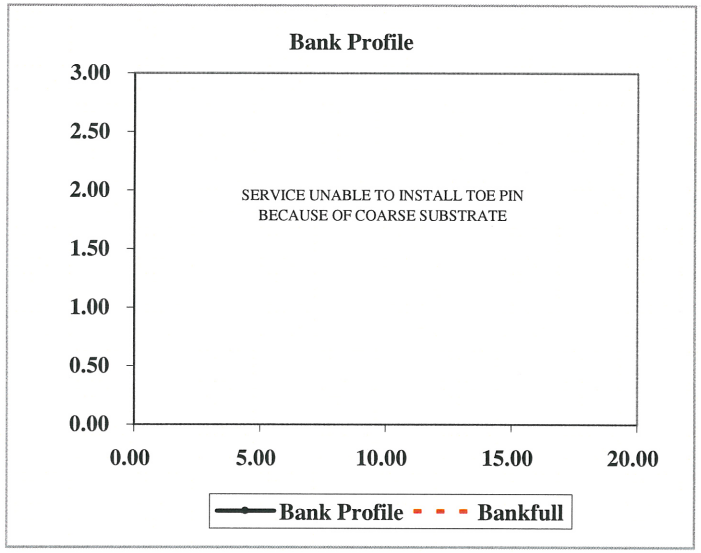
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

Horizontal Distance	Vertical Height	Notes
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		

Bankfull

Horizontal Distance	Vertical Height	Notes



MOORES RUN - REACH 06

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	RRS	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	**#DIV/0!**
Reach:	06	**Comments:**	GPS Coordinates:						**Low**
Location:	BALT XS 16		LMON: N: 39° 20' 04.8" W: 76° 32' 15.6" (+/- 21 feet)					**Notes:**	RIGHT BANK
Date:	10/7/03		RMON: N: 39° 20' 04.8" W: 76° 32' 16.2" (+/- 18 feet)						Low erosion potential b/c large boulders on bank.

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
		#DIV/0!	#DIV/0!	#DIV/0!	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
	0.00	#DIV/0!	#DIV/0!	#DIV/0!	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
			1.00	Very Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
			10.00	Extreme	
			Adjustment		Notes
Bank Materials					Boulders
			Adjustment		Notes
Bank Stratification					
		TOTAL SCORE	**#DIV/0!**		

Bank Erosion Potential

Erodibility Variables		Very Low	Low	Moderate	High	Very High	Extreme
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

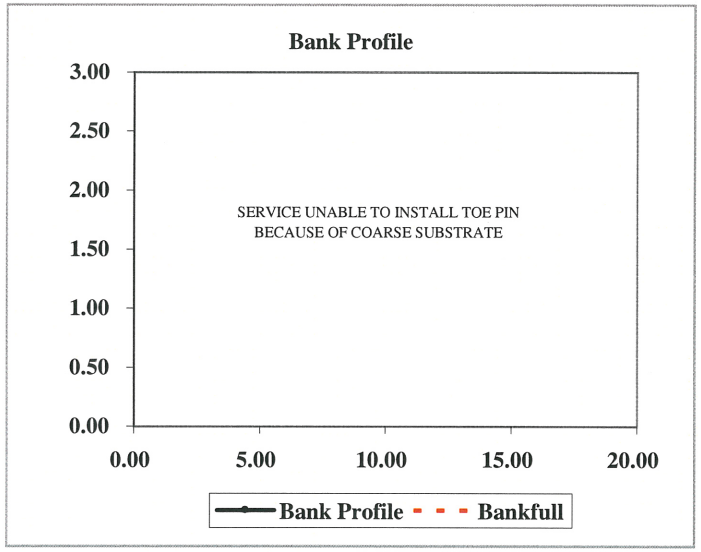
Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile		
Horizontal Distance	**Vertical Height**	**Notes**
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		
Bankfull		
Horizontal Distance	**Vertical Height**	**Notes**



MOORES RUN - REACH 06

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	RRS	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	**35.68**
Reach:	06	**Comments:**	GPS Coordinates:						**High**
Location:	USFWS XS D		LMON: N: 39° 20' 06.1" W: 76° 32' 16.2" (+/- 18 feet)					**Notes:**	LEFT BANK
Date:	10/8/03		RMON: N: 39° 20' 05.5" W: 76° 32' 17.0" (+/- 12 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
10.80	3.20	3.38	10.00	Extreme	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
0.75	10.80	0.07	8.78	Very High	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
65.00	0.07	4.51	10.00	Extreme	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
60.00			3.90	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
15.00			8.00	Very High	
			Adjustment		Notes
Bank Materials			(5.00)		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**35.68**		

Bank Erosion Potential

Erodibility Variables		Very Low	Low	Moderate	High	Very High	Extreme
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

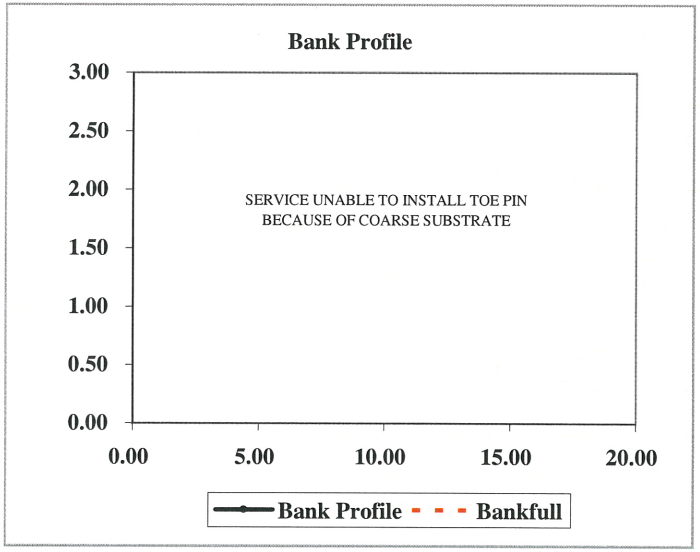
Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile		
Horizontal Distance	**Vertical Height**	**Notes**
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		
Bankfull		
Horizontal Distance	**Vertical Height**	**Notes**



MOORES RUN - REACH 06

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	CS/SD	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	**38.92**
Reach:	06	**Comments:**	GPS Coordinates:						**High**
Location:	BALT XS 14		LMON: N: 39° 20' 06.9" W: 76° 32' 17.2" (+/- 23 feet)					**Notes:**	LEFT BANK
Date:	10/6/03		RMON: N: 39° 20' 06.5" W: 76° 32' 17.8" (+/- 18 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
9.45	3.00	3.15	10.00	Extreme	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
0.25	9.45	0.03	10.00	Extreme	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
10.00	0.03	0.26	10.00	Extreme	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
50.00			3.41	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
35.00			5.50	Moderate	
			Adjustment		Notes
Bank Materials			0.00		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**38.92**		

Bank Erosion Potential

		Very Low	Low	Moderate	High	Very High	Extreme
Erodibility Variables							
Bank Height / Bankfull Height	Value	1.00-1.10	1.11-1.19	1.20-1.50	1.60-2.00	2.10-2.80	>2.80
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Root Depth / Bank Height	Value	1.00-0.90	0.89-0.50	0.49-0.30	0.29-0.15	0.14-0.05	<0.05
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Weighted Root Density	Value	100-80	79-55	54-30	29-15	14-5	<5
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Bank Angle	Value	0-20	21-60	61-80	81-90	91-119	>119
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10
Surface Protection	Value	100-80	79-55	54-30	29-15	14-10	<10
	Index	1.0-1.9	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.0	10

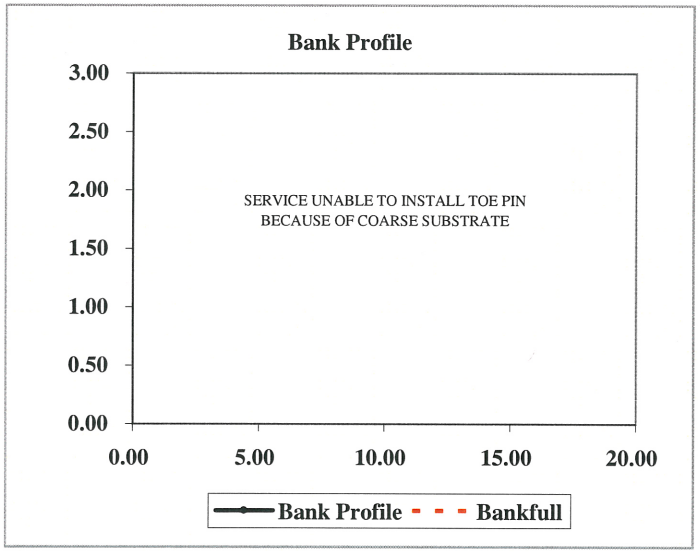
Adjustments

Bank Material	
Bedrock	Bedrock banks have a very low erosion potential.
Boulders	Boulder banks have a low erosion potential.
Cobble	Substract 10 points. No adjustment if sand/gravel compose greater than 50% of bank.
Sand/Silt/Clay Loam	Add 5 points.
Gravel	Add 5-10 points depending on percentage of bank material composed of sand.
Sand	Add 10 points.
Silt / Clay	No adjustment.

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile		
Horizontal Distance	**Vertical Height**	**Notes**
SERVICE UNABLE TO INSTALL TOE PIN BECAUSE OF COARSE SUBSTRATE		
Bankfull		
Horizontal Distance	**Vertical Height**	**Notes**



MOORES RUN - REACH 06

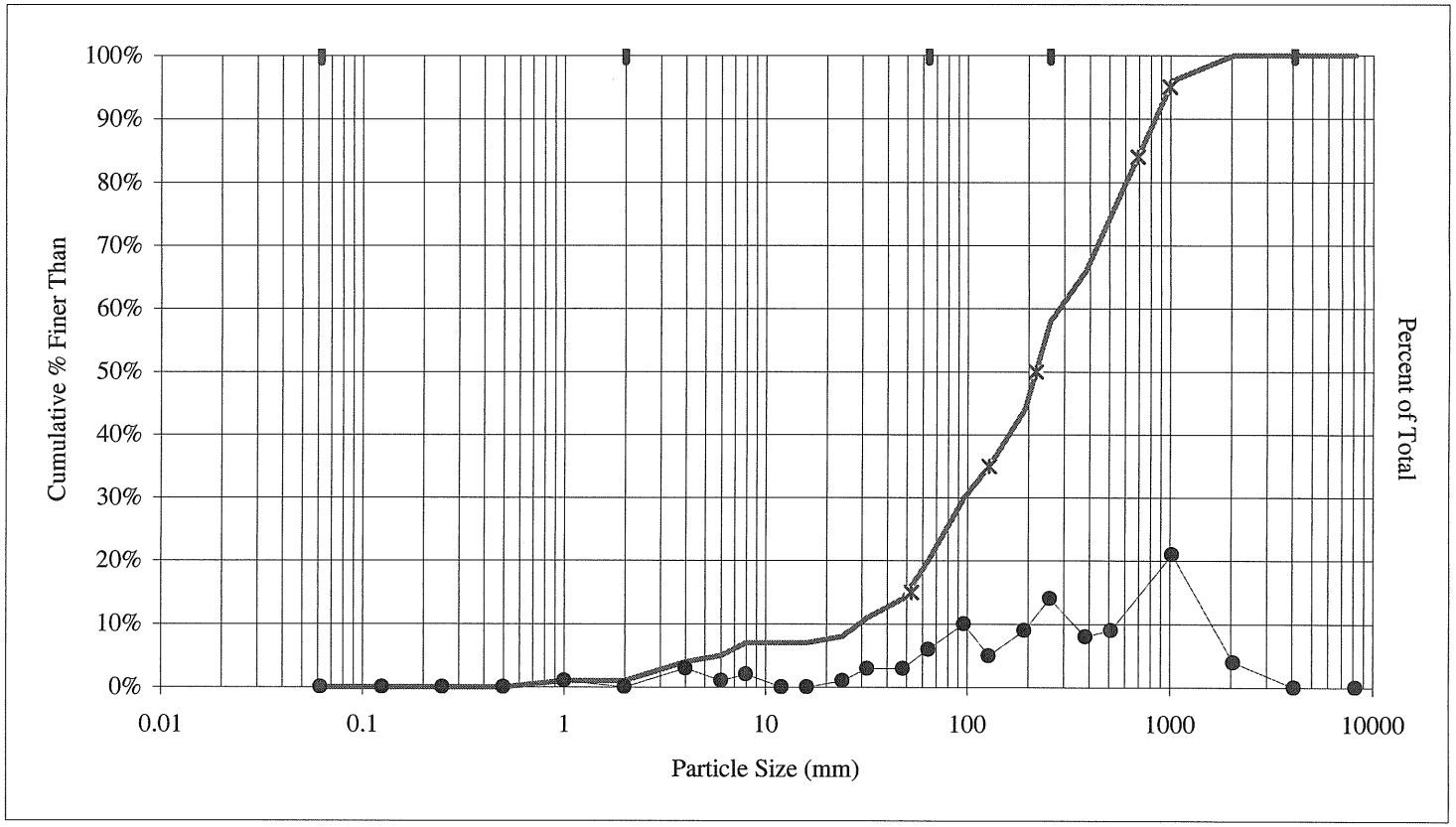
Pebble Count Worksheet

COMMENTS: Moores Run Riffle Pebble Count

Particle Size (mm)	% finer than	Total Count
<0.062	0%	0
0.062 - 0.125	0%	0
0.125 - 0.25	0%	0
0.25 - 0.5	0%	0
0.5 - 1.0	1%	1
1 - 2	1%	0
2 - 4	4%	3
4 - 6	5%	1
6 - 8	7%	2
8 - 12	7%	0
12 - 16	7%	0
16 - 24	8%	1
24 - 32	11%	3
32 - 48	14%	3
48 - 64	20%	6
64 - 96	30%	10
96 - 128	35%	5
128 - 192	44%	9
192 - 256	58%	14
256 - 384	66%	8
384 - 512	75%	9
512 - 1024	96%	21
1024 - 2048	100%	4
2048 - 4096	100%	0
> 4096	100%	0

STREAM NAME: Moores Run, Baltimore, Maryland
USGS ID #:
FWS ID #: Reach 06 - USFWS XS D - Riffle Pebble Count
DATE: 10/8/03
CREW: TLM, KDR

Particle Size Distribution (mm)	D16	D35	D50	D84	D95
	52.83	128.00	217.19	689.10	990.75



U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Riffle Pebble Count
File:Reach 06 - USFWS XS D - Riffle Pebble Count
01/29/04

MOORES RUN - REACH 06

MODIFIED PFANKUCH STREAM REACH INVENTORY AND CHANNEL STABILITY EVALUATION

Stream:	Moores Run	**Observer(s):**	TLM	**Ex. Stream Type:**	F **Ref. Stream Type:** C3
Reach:	6	**Comments:**		**Grand Total:**	71.00
Location:	Baltimore City, MD			**Stability Rating:**	Good
Date:	10/8/03			**Notes:**	

Location	Key	Category	Excellent			Good			Fair			Poor		
			Description	Rating	Score	Description	Rating	Score	Description	Rating	Score	Description	Rating	Score
Upper Banks	1	Landform Slope	Bank slope gradient < 30%.	2		Bank slope gradient 30-40%.	4		Bank slope gradient 40-60%.	6		Bank slope gradient > 60%.	8	8
	2	Mass Wasting	No evidence of past or furture mass wasting.	3		Infrequent. Mostly healed over. Low future potential.	6	7	Frequent or large, causing sediment nearly year long.	9		Frequent or large, causing sediment nearly year long OR imminent danger of same.	12	
	3	Debris Jam Potential	Essentially absent from immediate channel area.	2		Present, but mostly small twigs and limbs.	4	4	Moderate to heavy amounts, mostly larger sizes.	6		Moderate to heavy amounts, predominantly larger sizes.	8	
	4	Vegetative Bank Protection	> 90% plant density. Vigor and variety suggest a deep, dense soil binding root mass.	3		70-90% density. Fewer species or less vigor suggest less dense or deep root mass.	6		50-70% density. Lower vigor and fewer species from shallow, discontinuous root mass.	9	9	< 50% density plus fewer species and less vigor indicating poor, discontinuous, and shallow root mass.	12	
Lower Banks	5	Channel Capacity	Ratio of w/d ratio to reference w/d ratio between 1.0-1.2.	1	1	Ratio of w/d ratio to reference w/d ratio between 1.2-1.4.	2		Ratio of w/d ratio to reference w/d ratio between 1.4-1.6.	3		Ratio of w/d ratio to reference w/d ratio between 1.6-1.8.	4	
			For incising channels, ratio of w/d ratio to reference w/d ratio between 0.8-1.0.	1		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.6-0.8.	2		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.4-0.6.	3		**For incising channels**, ratio of w/d ratio to reference w/d ratio between 0.2-0.4.	4	
	6	Bank Rock Content	> 65% with large angular boulders. > 12" common.	2	2	40-65%. Mostly boulders and small cobbles 6-12".	4		20-40% with most in the 3-6" diameter class.	6		< 20% rock fragments of gravel sizes, 1-3" or less.	8	
	7	Obstructions to Flow	Rocks and logs firmly imbedded. Flow pattern without cutting or deposition. Stable bed.	2	2	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4		Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6		Frequent obstruction and deflectors cause bank erosion year long. Sediment traps full, channel migration occurring.	9	
	8	Cutting	Little or none. Infrequent raw banks < 6".	4		Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	6	Significant. Cuts 12-24" high. Root mat overhangs and sloughing evident.	12		Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16	
	9	Deposition	Little or no enlargement of channel or point bars.	4	5	Some new bar increase, mostly from coarse gravel.	8		Moderate deposition of new gravel and coarse sand on old and some new bars.	12		Extensive deposit of predominantly fine particles. Accelerated bar development.	16	
Channel Bottom	10	Rock Angularity	Sharp edges and corners. Plane surfaces rough.	1		Rounded corners and edges, surfaces smooth, flat.	2	2	Corners and edges well rounded in 2 dimensions.	3		Well rounded in all dimensions, surfaces smooth.	4	
	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1		Mostly dull, but may have < 35% bright surfaces.	2		Mixture dull and bright, *ie*. 35-65% mixture range.	3	3	Predominantly bright, > 65% exposed or scoured surfaces.	4	
	12	Cosolidation of Particles	Assorted sizes tightly packed or overlapping.	2		Moderately packed with some overlapping.	4	4	Mostly loose assortment with no apparent overlap.	6		No packing evident. Loose assortment easily moved.	8	
	13	Bottom Size Distribution	No size change evident. Stable material 80-100%.	4	4	Distribution shift light. Stable material 50-80%.	8		Moderate change in sizes. Stable materials 20-50%.	12		Marked distribution change. Stable materials 0-20%. Sand deposition.	16	
	14	Scouring and Deposition	< 5% of bottom affected by scour or deposition.	6		5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	12	30-50% affected. Deposits and scour at obstructions, constriction and bends. Some filling of pools.	18		> 50% of the bottom in a state of flux or change nearly year long.	24	
	15	Aquatic Vegetation	Abundant growth moss-like, dark green perennial. In swift water, too.	1		Common. Algae forms in low velocity and pool areas. Moss here, too.	2	2	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3		Perennial types scarce or absent. Yellow-green, short term bloom may be present.	4	
					Excellent Total			**Good Total**			**Fair Total**			**Poor Total**
					14			**37**			**12**			**8**

Stream Type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107
Fair (Moderately Unstable)	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+
Stream Type	**D6**	**DA3**	**DA4**	**DA5**	**DA6**	**E3**	**E4**	**E5**	**E6**	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**G1**	**G2**	**G3**	**G4**	**G5**	**G6**
Good (Stable)	67-98	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Moderately Unstable)	99-125	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-126	108-120
Poor (Unstable)	126+	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	111+	111+	79+	79+	121+	121+	126+	121+