APPENDIX C

MOORES RUN – REACH FIELD DATA

APPENDIX
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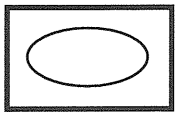
- F. Pfankuch Stream Reach Inventory and Channel Stability Evaluation

Geomorphic Map Symbols Key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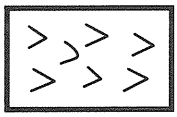
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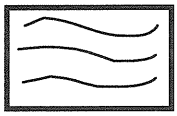
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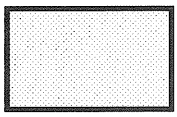
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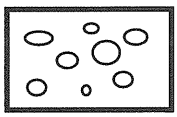
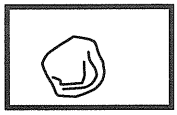
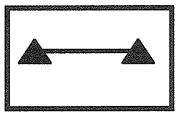
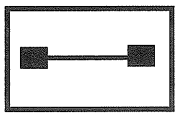
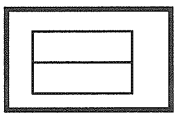

Gravel

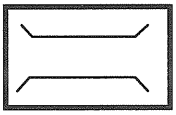

Boulder

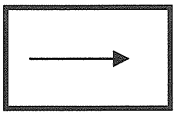
Bedrock


Baltimore City Cross Section

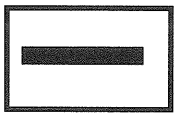

U.S. Fish and Wildlife Service Cross Section

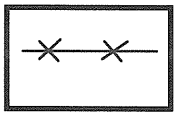

Building

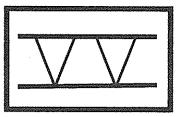

Bridge Crossing

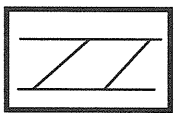

Flow Direction

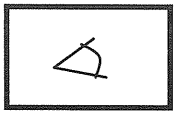
Fallen Tree


Utility Crossing


Fence


Raw Steep Bank


Stable Sloped Bank
(angle of line represents angle of bank)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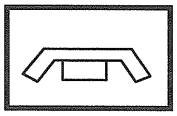
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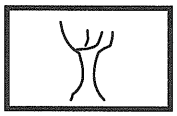
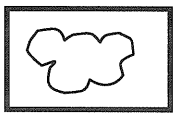
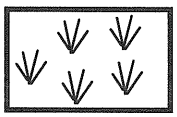
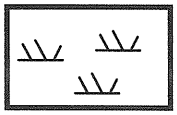
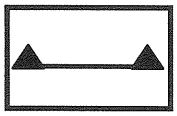

Individual Tree


Group of Trees


Herbaceous

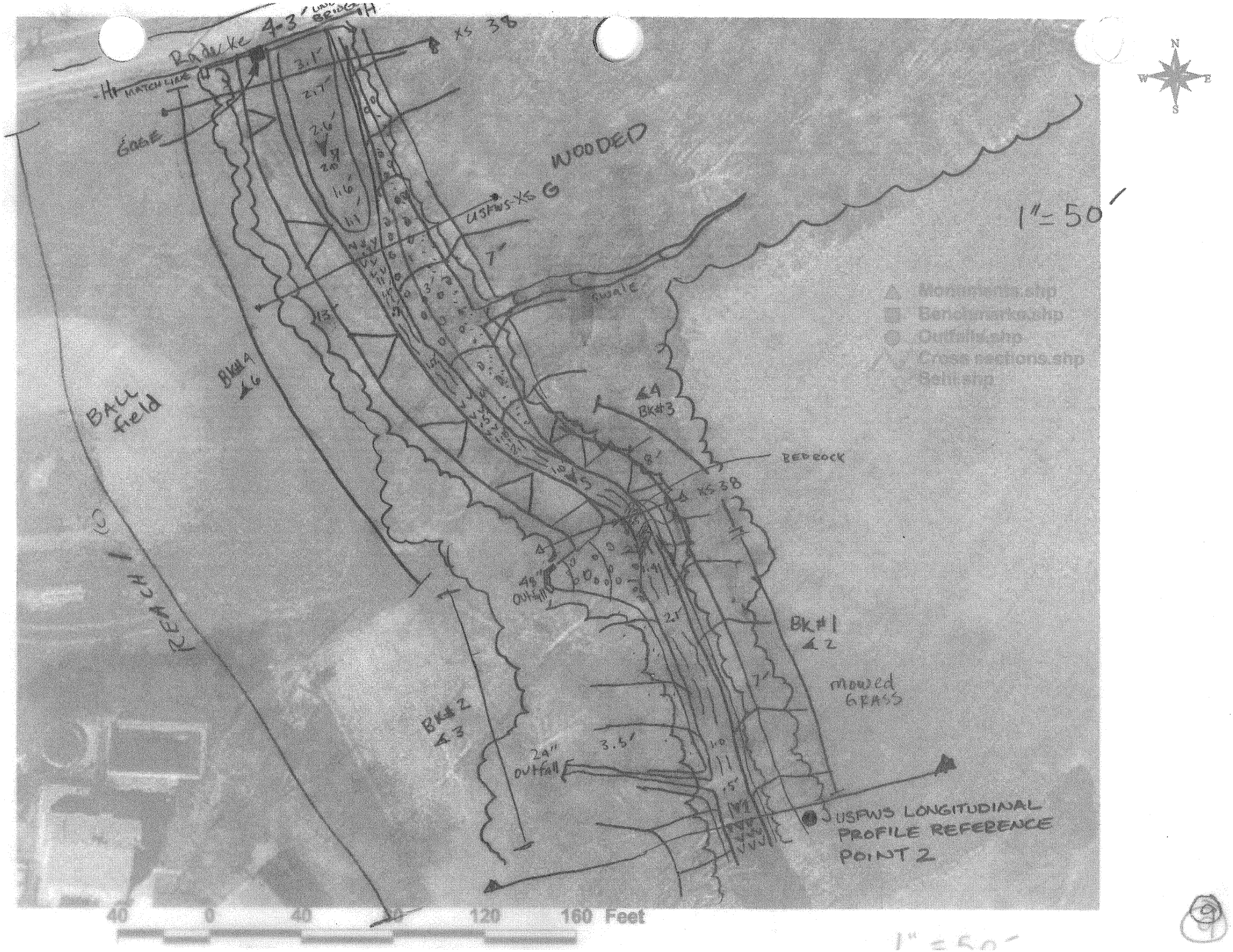

Wetland


Project Reach Limits

CROSS SECTION ABBREVIATIONS

Symbol	Definition
USFWS	U.S. Fish and Wildlife Service
LTMON	Left top monument
LBMON	Left bottom monument
RTMON	Right top monument
RBMON	Right bottom monument
BPIN	Bottom toe pin
TPIN	Top toe pin
LTOB	Left top of bank
RTOB	Right top of bank
LBF	Left bankfull
RBF	Right bankfull
LEW	Left edge of water
REW	Right edge of water
SL BRK	Slope break
SL BRK (SL)	Slight slope break
IP	Inflection point
TW	Thalweg
LTOE SLP	Left toe slope
RTOE SLP	Right toe slope
BAR	Bar feature
FL	Fence line
TBERM	Top of berm
FT FLAT	Front flat
RLC CHAN	Relic channel
ROOT	Tree root
FT TERR	Front terrace
GS	Ground shot
CS	Channel shot
OC	Overflow channel
UNDERCUT	Undercut bank
GRVL	Gravel
ROCK	Rock
BLDR	Boulder
BR	Bedrock
T SCOUR	Top of scour
WALL	Wall
XS	Cross section

MOORES RUN
REACH 01 – FIELD DATA



Radecke 4-3
XS 38
MATCH LINE
GAGE
WOODED
USFWS-XS G
1" = 50'
Monuments.shp
Benchmarks.shp
Outfalls.shp
Cross sections.shp
Bell.shp
BALL field
BK#4
BK#3
BEDROCK
XS 38
48" outfall
BK#1
mowed GRASS
BK#2
24" outfall
USFWS LONGITUDINAL PROFILE REFERENCE POINT 2
REACH 1
40 0 40 80 120 160 Feet
1" = 50'

MOORES RUN - REACH 01

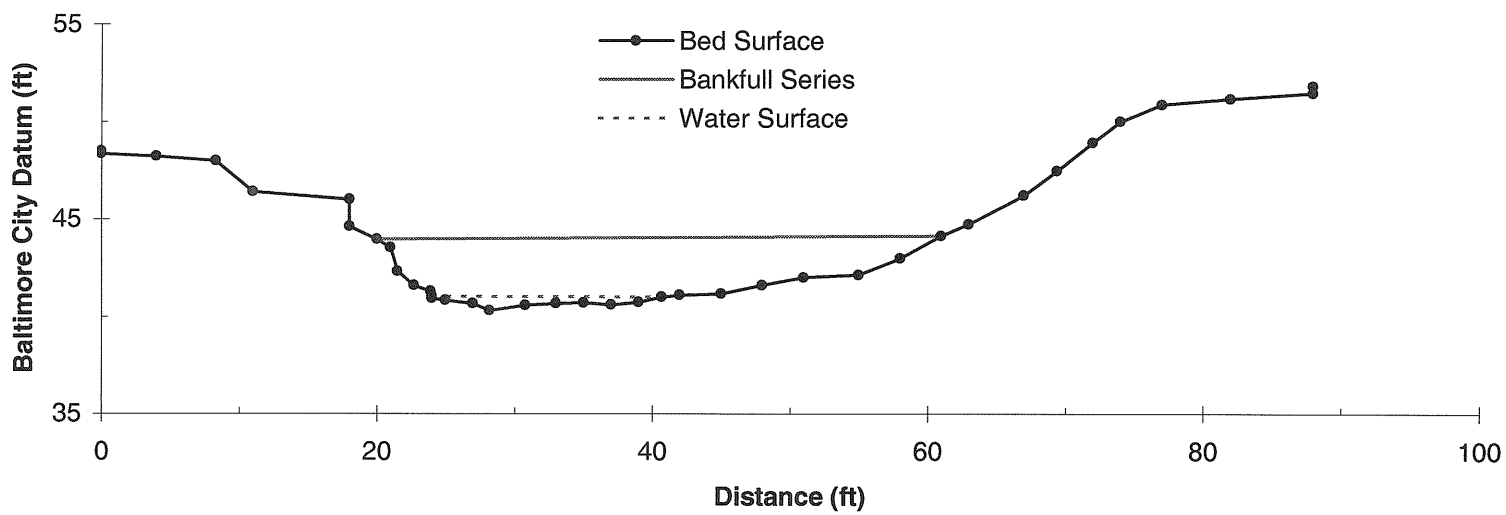
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
41.00	104.87	2.56	3.69	42.92	2.44	Bankfull
16.70	5.90	0.35	0.71	16.90	0.35	Water Surface

STREAM: Moores Run
REACH & XS: Reach 01 - Balt. XS 38 (Run)
DATE: 10/02/03
CREW: FWS (RRS, KDR)
DATA: SLD
QA/QC: KR

MON. COORD.: LTMON: N: 39° 19' 46.6" W: 76° 32' 03.6" (+/- 19 ft)
RTMON: N: 39° 19' 46.1" W: 76° 32' 04.6" (+/- 19 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
LTMON	0.0	48.50	CS/BR	27.0	40.67
LBMON	0.0	48.34	TW/BR	28.2	40.31
GS	4.0	48.21	CS/BR	30.8	40.58
LTOB	8.3	47.99	CS/BR	33.0	40.67
GS	11.0	46.40	CS/BR	35.0	40.71
GS	18.0	46.00	CS/BR	37.0	40.61
SL BRK	18.0	44.63	CS/GRVL	39.0	40.74
LBF	20.0	43.96	REW	40.7	41.00
SL BRK	21.0	43.53	CS	42.0	41.10
SL BRK	21.5	42.33	CS	45.0	41.16
SL BRK	22.7	41.59	CS	48.0	41.60
IP	23.9	41.30	SL BRK	51.0	42.01
LEW	24.0	41.03	SL BRK	55.0	42.13
CS/BR	24.0	40.94	SL BRK	58.0	42.97
CS/BR	25.0	40.84	RBF	61.0	44.15

Identifier	Distance (ft)	Elevation (ft)
RTOB	63.0	44.73
SL BRK	67.0	46.20
GS	69.4	47.45
GS	72.0	48.93
GS	74.0	49.99
GS	77.0	50.86
GS	82.0	51.17
RBMON	88.0	51.46
RTMON	88.0	51.81



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Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Cross Sections
File: Reach 01 - BALT XS 38 Balt. City Datum
01/29/04

MOORES RUN - REACH 01

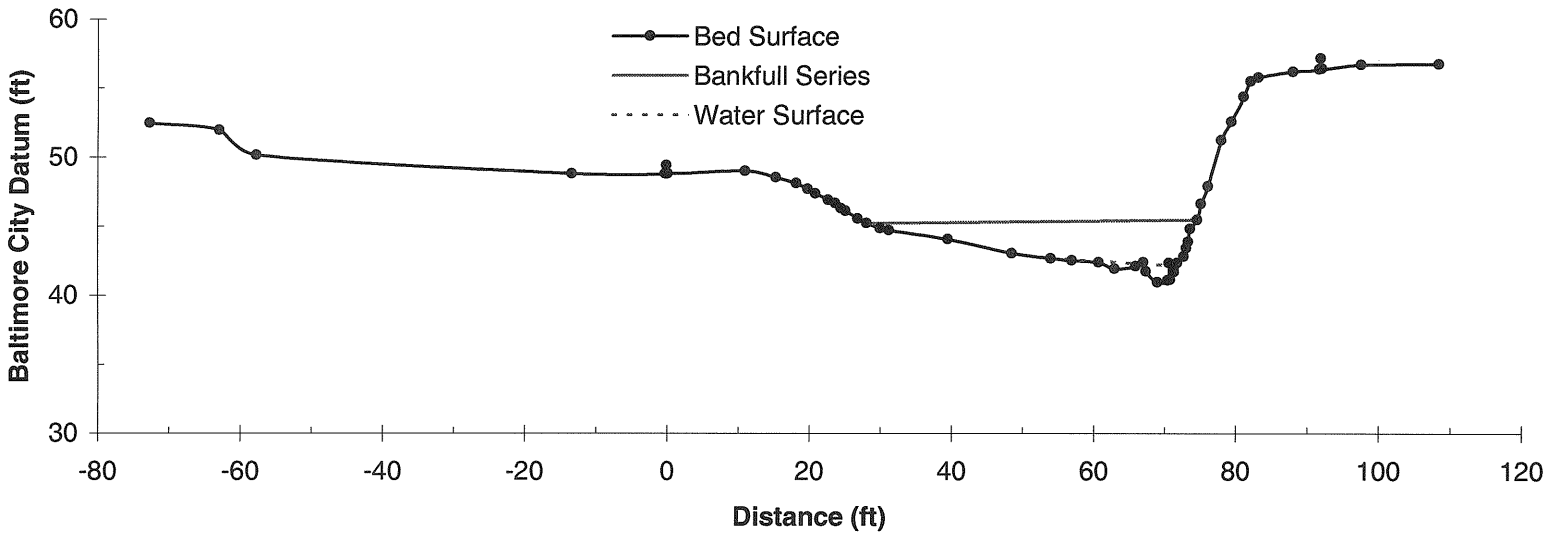
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
46.50	101.10	2.17	4.48	51.72	1.95	Bankfull
17.44	5.99	0.34	1.27	20.89	0.29	Water Surface

STREAM: Moores Run
REACH & XS: Reach 01 - USFWS XS G (Riffle)
DATE: 10/07/03
CREW: FWS (CE/SD)
DATA: KR
QA/QC: SLD

MON. COORD.: LTMON: N: 39° 19' 47.8" W: 76° 32' 04.4" (+/- 24 ft)
RTMON: N: 39° 19' 47.7" W: 76° 32' 06.0" (+/- 18 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
GS	-72.7	52.45	SL BRK	25.2	46.09
GS	-62.9	51.96	SL BRK	26.9	45.56
LTOE SL	-57.7	50.15	LBF	28.1	45.21
GS	-13.3	48.81	SL BRK	30.0	44.86
LBMON	-0.2	48.80	BAR	31.2	44.71
LTMON	0.0	49.40	BAR	39.5	44.05
LBMON	0.1	48.82	BAR	48.5	43.05
GS	11.0	48.99	LEW	54.0	42.68
LTOB	15.4	48.52	CS	57.0	42.52
SL BRK	18.2	48.10	CS	60.8	42.39
SL BRK	19.8	47.70	CS	63.0	41.91
SL BRK	20.9	47.38	BLDR	66.0	42.10
SL BRK	22.7	46.90	BLDR	67.0	42.40
SL BRK	23.7	46.67	BLDR	67.4	41.74
SL BRK	24.5	46.30	CS	69.0	40.95

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
BPIN	70.5	41.11	SL BRK	81.2	54.36
TPIN	70.7	42.34	FL	82.2	55.49
BPIN/TW	70.9	41.13	RTOB	83.3	55.79
RTOE	71.3	41.71	GS	88.1	56.19
REW	71.4	42.15	RBMON	91.8	56.36
SL BRK	71.8	42.35	RTMON	92.0	57.15
SL BRK	72.7	42.82	RBMON	92.1	56.40
SL BRK	73.1	43.43	GS	97.7	56.69
SL BRK	73.3	43.89	GS	108.5	56.73
SL BRK	73.7	44.81			
RBF	74.6	45.46			
SL BRK	75.2	46.61			
SL BRK	76.1	47.87			
SL BRK	78.0	51.22			
SL BRK	79.5	52.58			



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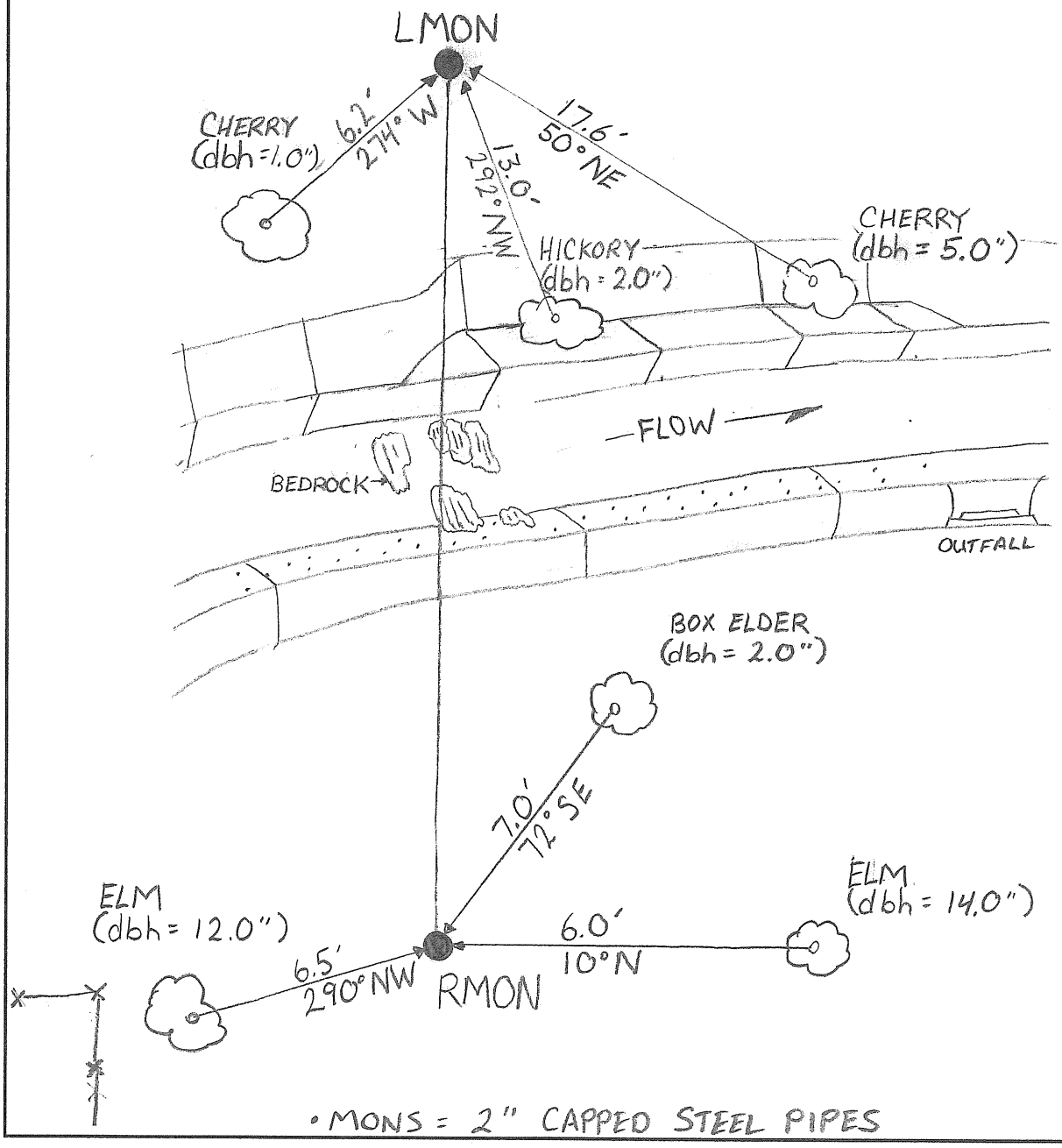
Chesapeake Bay Field Office

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

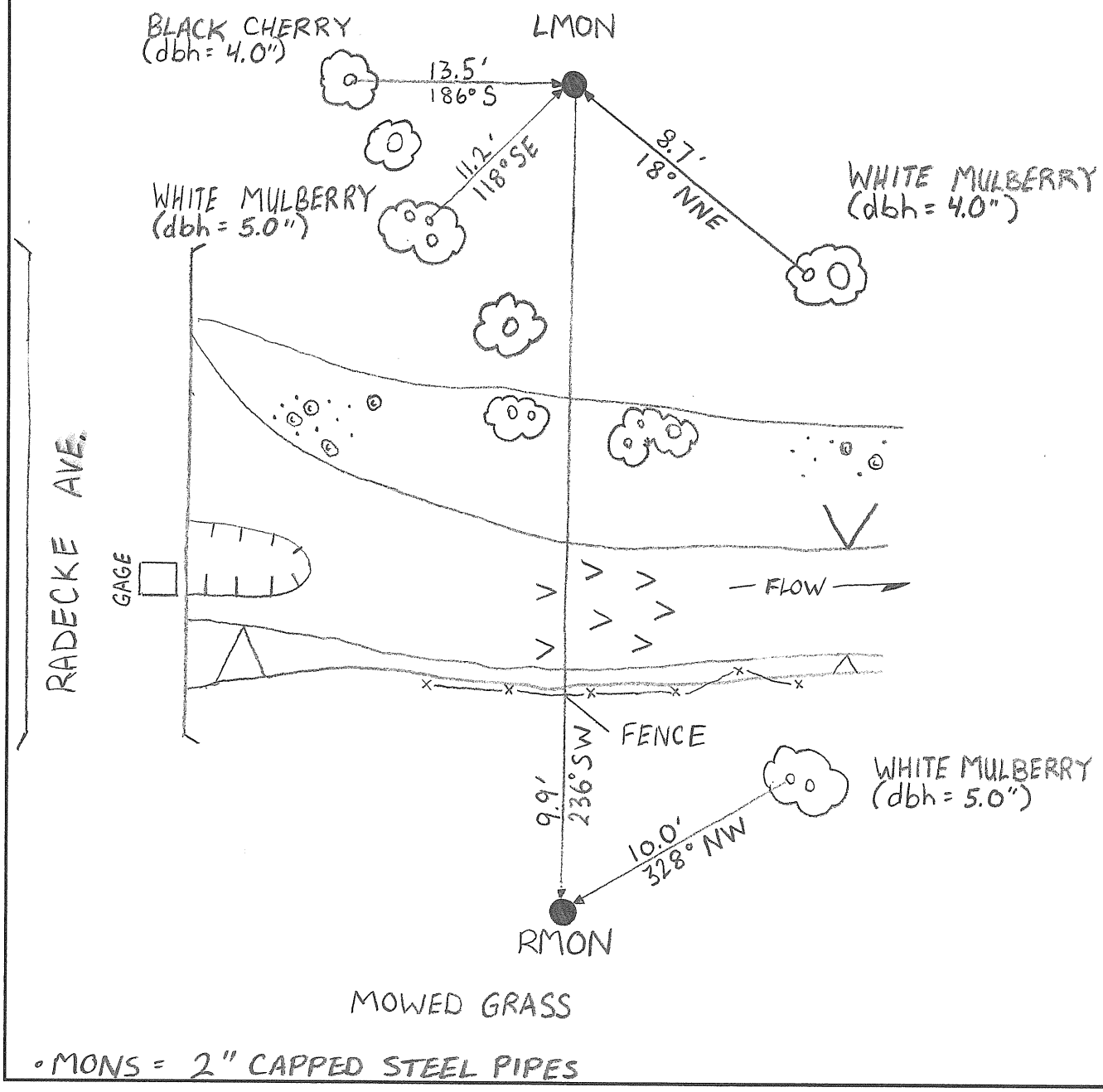
Moores Run
Reach 01
Baltimore Cross Section 38
(Stream Feature: Run)

Cross-Section Monument Map



Moores Run
Reach 01
Baltimore Cross Section G
(Stream Feature: Riffle)

Cross-Section Monument Map



MOORES RUN - REACH 01

BANK PROFILE AND EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	MAS, SLD	**Data:**	CE	**QA/QC:**	CE	**Total Score:**	**25.98**
Reach:	01	**Comments:**	GPS Coordinates:						**Moderate**
Location:	BALT XS 38		LMON: N: 39° 19' 46.6" W: 76° 32' 03.6" (+/- 19 feet)					**Notes:**	Left Bank
Date:	2/26/04		RMON: N: 39° 19' 46.1" W: 76° 32' 04.6" (+/- 19 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
6.00	3.00	2.00	7.90	High	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
6.00	6.00	1.00	1.00	Very Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
20.00	1.00	20.00	7.22	High	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
34.00			2.63	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	**25.98**		

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

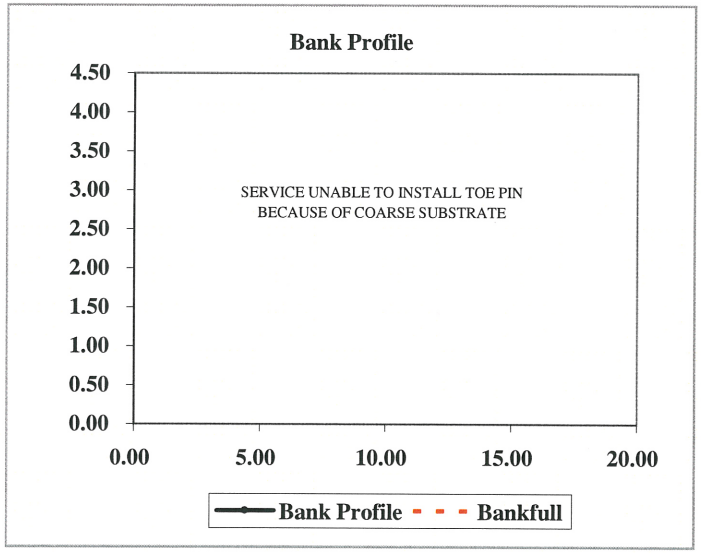
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

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

Bankfull

Horizontal Distance	Vertical Height	Notes



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Chesapeake Bay Field Office

Path: S:\SHARP Projects\Baltimore City\Moores Run\DATA\BEHI & Bank Profiles\
File: Reach 01 - BALT XS 38 (LB)
03/15/04

MOORES RUN - REACH 01

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	CE/SD	**Data:**	KR	**QA/QC:**	SLD	**Total Score:**	47.66
Reach:	01	**Comments:**	GPS Coordinates:						**Extreme**
Location:	USFWS XS G		LMON: N: 39° 19' 47.8" W: 76° 32' 04.4" (+/- 24 feet)					**Notes:**	RIGHT BANK
Date:	10/7/03		RMON: N: 39° 19' 47.7" W: 76° 32' 06.0" (+/- 18 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
14.08	3.75	3.75	10.00	Extreme	From XS data
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
0.25	14.08	0.02	10.00	Extreme	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
10.00	0.02	0.18	10.00	Extreme	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
55.00			3.66	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
10.00			9.00	Very High	
			Adjustment		Notes
Bank Materials			5.00		Clay Loam
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**47.66**		

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

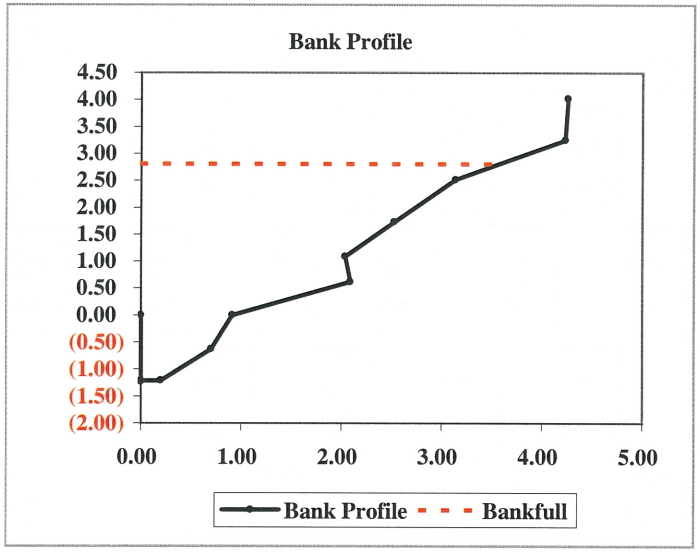
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

Horizontal Distance	Vertical Height	Notes
0.00	(1.23)	B TOE PIN
0.00	0.00	TOP TOE PIN
0.00	(1.21)	B TOE PIN
0.20	(1.21)	CS
0.70	(0.63)	SL BRK
0.91	0.00	SL BRK
2.09	0.62	SL BRK
2.04	1.09	SL BRK
2.53	1.73	SL BRK
3.14	2.52	SL BRK
4.23	3.25	SL BRK
4.26	4.02	SL BRK

Bankfull

Horizontal Distance	Vertical Height	Notes
0.00	2.81	



MOORES RUN - REACH 01

MODIFIED PFANKUCH STREAM REACH INVENTORY AND CHANNEL STABILITY EVALUATION

Stream:	Moores Run	**Observer(s):**	TLM	**Ex. Stream Type:**	C	**Ref. Stream Type:**	C4
Reach:	1	**Comments:**		**Grand Total:**	83.00		
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	5	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	6	50-70% density. Lower vigor and fewer species from shallow, discontinuous root mass.	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		Ratio of w/d ratio to reference w/d ratio between 1.2-1.4.	2	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	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		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	5	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		Some new bar increase, mostly from coarse gravel.	8	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		Corners and edges well rounded in 2 dimensions.	3		Well rounded in all dimensions, surfaces smooth.	4	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		Predominantly bright, > 65% exposed or scoured surfaces.	4	4
	12	Cosolidation of Particles	Assorted sizes tightly packed or overlapping.	2		Moderately packed with some overlapping.	4		Mostly loose assortment with no apparent overlap.	6	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		30-50% affected. Deposits and scour at obstructions, constriction and bends. Some filling of pools.	18	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	3	Perennial types scarce or absent. Yellow-green, short term bloom may be present.	4	
				Excellent Total	4		Good Total	34		Fair Total	37		Poor Total	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+

MOORES RUN
REACH 02 – FIELD DATA

1" = 50'
Reach 2 (B)
BK#7
16
BC-
XS 30
G'
G
MATCH LINE
BC-
XS 32
4'-5'
4'-5'
MOWED
GRASS
MOWED
GRASS
BK#5
13
BK#6
14
BC-
XS 34
12
RADECKE ROAD
H'
H
MATCH LINE
Moores Run Drive
NOTE: Photos 8-11 where taken
of XS 32 by CE
40
80
120
160 Feet

MOORES RUN - REACH 02

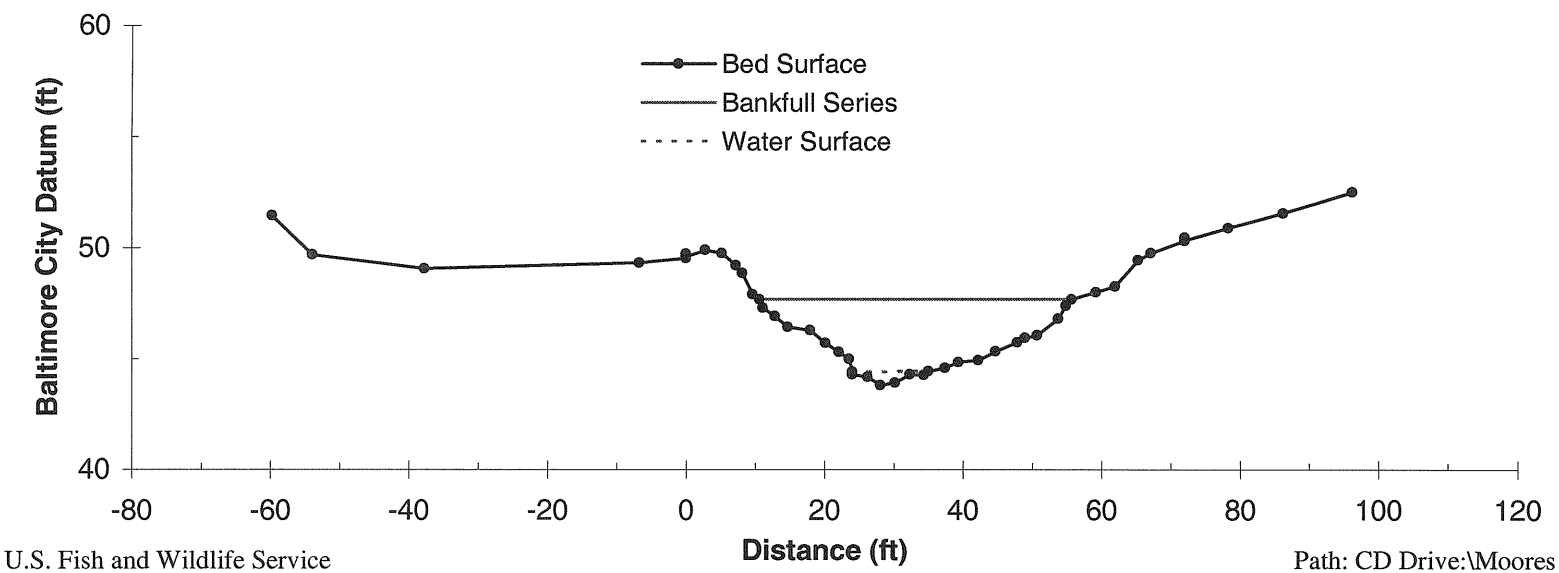
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
45.10	103.48	2.29	3.87	46.37	2.23	Bankfull
11.00	3.47	0.32	0.61	11.24	0.31	Water Surface

STREAM: Moores Run
REACH & XS: Reach 02 - Balt. XS 32 (Riffle)
DATE: 09/30/03
CREW: FWS (CE, SLD)
DATA: SLD
QA/QC: KR

MON. COORD.: LTMON: N: 39° 19' 50.4" W: 76° 32' 05.5" (+/- 22 ft)
RTMON: N: 39° 19' 50.3" W: 76° 32' 06.7" (+/- 23 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
GS	-59.8	51.45	BK FLAT	14.7	46.43
TOE	-53.9	49.69	FT FLAT	17.9	46.28
GS	-37.8	49.06	SL BRK	20.1	45.71
GS (TL)	-6.8	49.33	SL BRK	22.1	45.29
LBMON	0.0	49.53	IP	23.5	45.00
LTMON	0.0	49.71	LEW	24.0	44.42
LBMON	0.0	49.60	TOE	24.0	44.28
TBERM	2.8	49.89	CS	26.2	44.18
FT FLAT	5.2	49.76	TW	28.1	43.81
SL BRK	7.2	49.20	CS	30.2	43.91
SL BRK	8.1	48.86	CS	32.3	44.29
SL BRK	9.6	47.91	CS	34.3	44.26
LBF	10.6	47.68	REW	35.0	44.43
SL BRK	11.1	47.30	CS(BAR)	37.4	44.59
SL BRK	12.8	46.92	CS	39.3	44.85

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
CS	42.2	44.94	GS	78.3	50.88
CS	44.7	45.33	GS	86.2	51.54
CS	47.8	45.75	GS	96.2	52.48
FT FLAT	48.9	45.93			
BK FLAT	50.7	46.06			
SL BRK	53.7	46.80			
SL BRK	54.8	47.39			
RBF	55.7	47.68			
GS	59.2	48.00			
BK FLAT	61.9	48.26			
SL BRK	65.3	49.43			
FT FLAT	67.1	49.74			
RBMON	72.0	50.30			
RTMON	72.0	50.45			
RBMON	72.0	50.32			

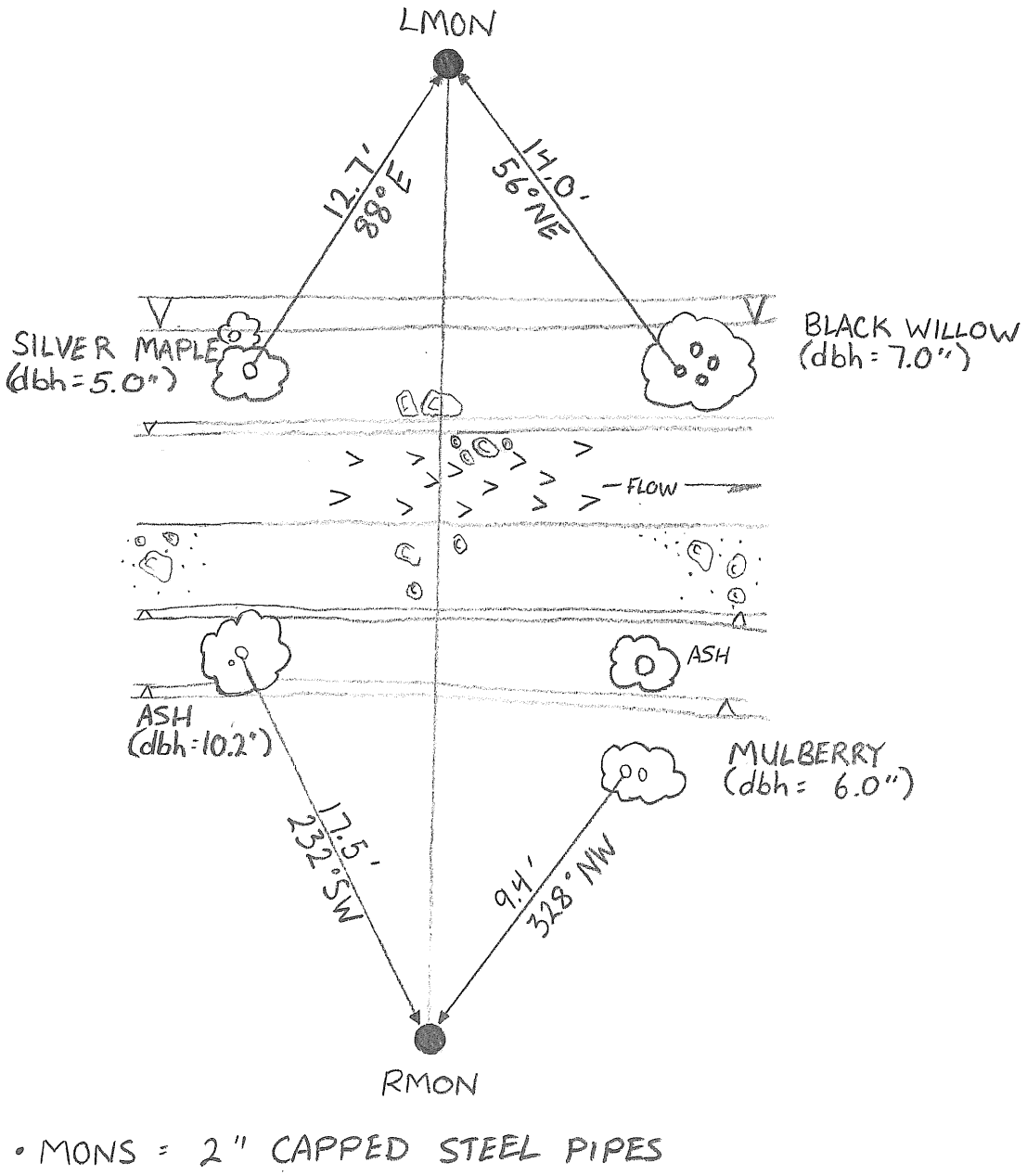


U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

Path: CD Drive:\Moores Run\Data\Cross Sections
File: Reach 02 - BALT XS 32 Balt. City Datum
01/30/04

Moores Run
Reach 02
Baltimore Cross Section 32
(Stream Feature: Riffle)

Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

MOORES RUN - REACH 02

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:**	**19.67**
Reach:	02	**Comments:**	GPS Coordinates:						**Low**
Location:	BALT XS 32		LMON: N: 39° 19' 50.4" W: 76° 32' 05.5" (+/- 22 feet)					**Notes:**	LEFT BANK
Date:	9/30/03		RMON: N: 39° 19' 50.3" W: 76° 32' 06.7" (+/- 23 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
2.77	1.25	2.22	8.17	Very High	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
2.77	2.77	1.00	1.00	Very Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
60.00	1.00	60.00	3.50	Low	
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	**19.67**		

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

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

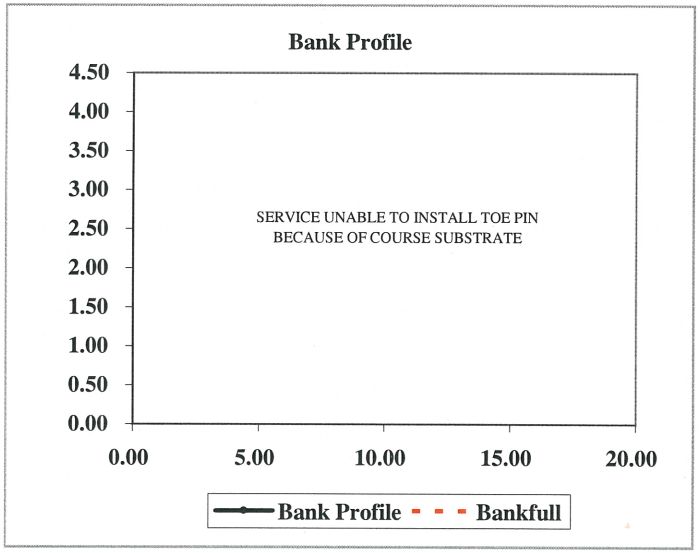
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

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 02

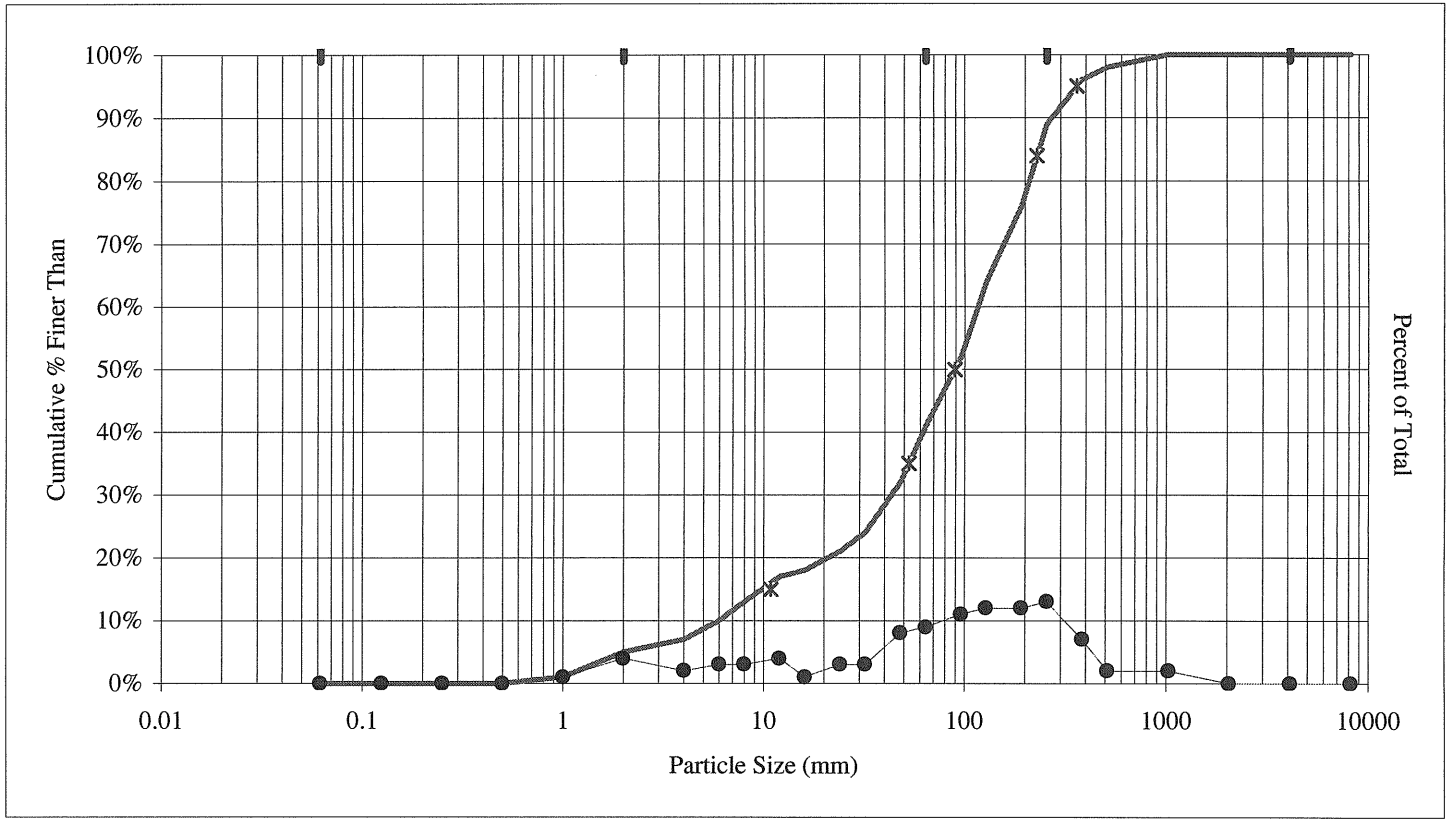
Pebble Count Worksheet

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	5%	4
2 - 4	7%	2
4 - 6	10%	3
6 - 8	13%	3
8 - 12	17%	4
12 - 16	18%	1
16 - 24	21%	3
24 - 32	24%	3
32 - 48	32%	8
48 - 64	41%	9
64 - 96	52%	11
96 - 128	64%	12
128 - 192	76%	12
192 - 256	89%	13
256 - 384	96%	7
384 - 512	98%	2
512 - 1024	100%	2
1024 - 2048	100%	0
2048 - 4096	100%	0
> 4096	100%	0

STREAM NAME: Moores Run, Baltimore, Maryland
USGS ID #:
FWS ID #: Reach 02 - Balt. XS 32 - Riffle Pebble Count
DATE: 10/8/03
CREW: TLM, KDR

Particle Size Distribution (mm)	D16	D35	D50	D84	D95
	10.84	52.83	89.18	229.19	362.39



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

Path: CD Drive:\Moores Run\Data\Riffle Pebble Count
File:Reach 02 - BALT XS 32 - Riffle Pebble Count
01/29/04

MOORES RUN - REACH 02

MODIFIED PFANKUCH STREAM REACH INVENTORY AND CHANNEL STABILITY EVALUATION

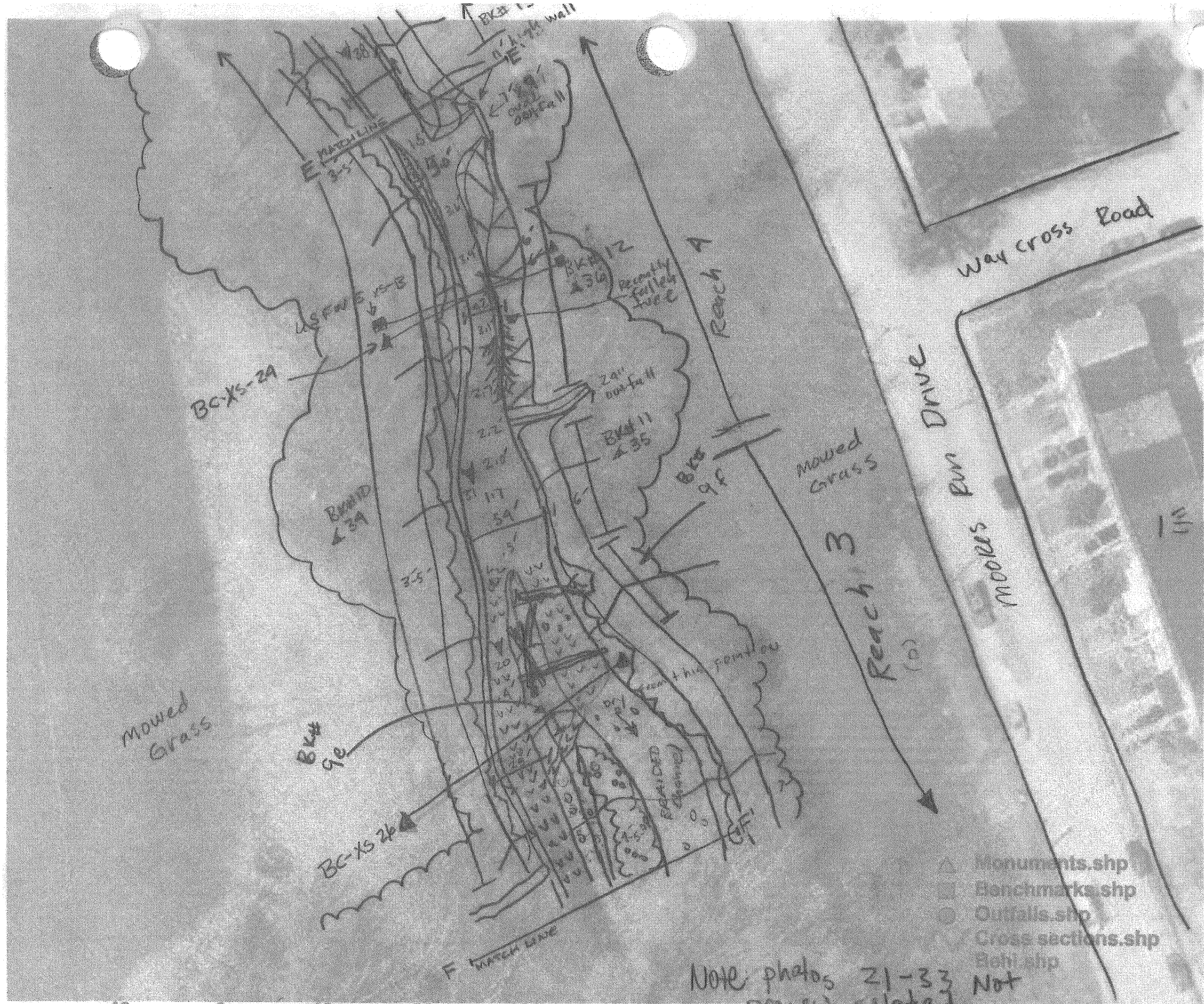
Stream:	Moores Run	**Observer(s):**	TLM	**Ex. Stream Type:**	C	**Ref. Stream Type:**	C3
Reach:	2	**Comments:**		**Grand Total:**	55.00		
Location:	Baltimore City, MD			**Stability Rating:**	Good		
Date:	10/8/03			**Notes:**			

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	3	Bank slope gradient 30-40%.	4		Bank slope gradient 40-60%.	6		Bank slope gradient > 60%.	8	
	2	Mass Wasting	No evidence of past or furture mass wasting.	3	3	Infrequent. Mostly healed over. Low future potential.	6		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	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	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			**Good Total**			**Fair Total**			**Poor Total**
					27			**12**			**12**			**4**

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 03 – FIELD DATA

1" = 50'
BC-XS-26
BK# 10
Feed by outfall
Trib 3' wide
1' deep
F
MATCH LINE
2.2' headcut
19
BK# 9a
RECENTLY FALLEN TREE
BC-XS28
USFWS XS-A
BK# 9b
use bank profile & BK# from cross section
BK# 8
17
Mowed Grass
BK# 9c
Mowed Grass
BK# 7
16
BC-XS30
G
G'
MATCH LINE
Moores Run Drive
Bucknell Road
Monuments.shp
Benchmarks.shp
Outfalls.shp
Cross sections.shp
Behi.shp
40 0 40 80 120 160 Feet
1" = 50'
7



Note: photos 21-33 Not project related

1" = 50'

1" = 50'

6

6

MOORES RUN - REACH 03

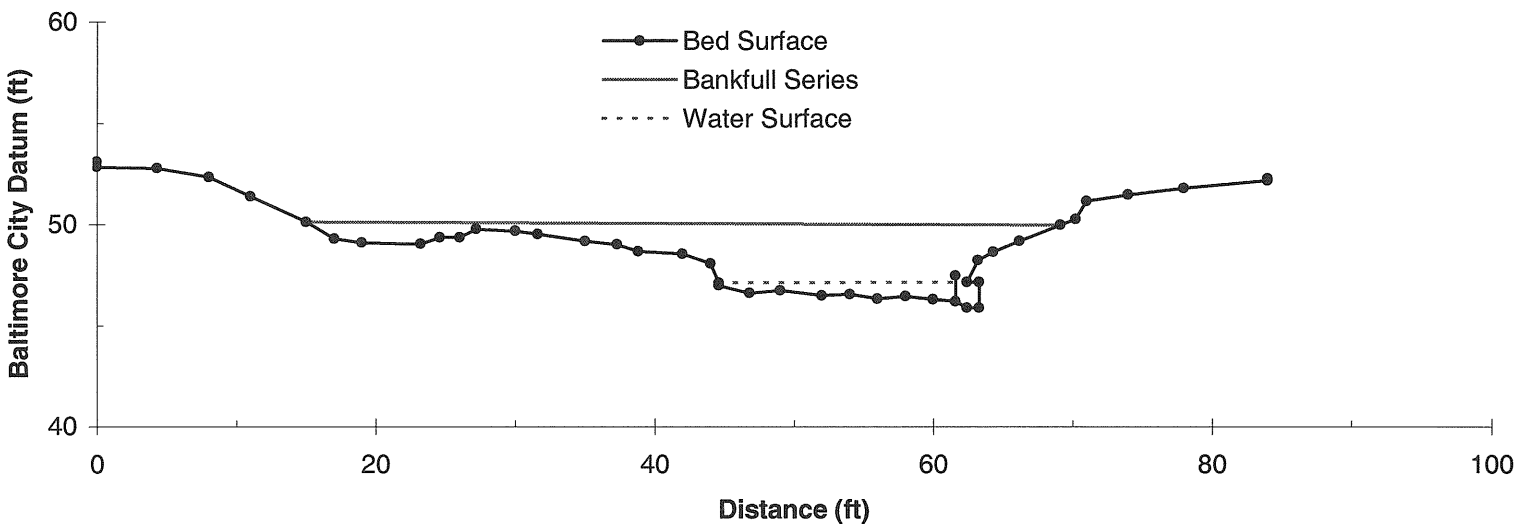
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
54.10	101.14	1.87	4.10	61.70	1.64	Bankfull
17.80	12.29	0.69	1.25	23.66	0.52	Water Surface

STREAM: Moores Run
REACH & XS: Reach 03 - Balt. XS 28 (Run)
DATE: 10/03/03
CREW: FWS (SLD, RRS)
DATA: SLD
QA/QC: KR

MON. COORD.: LTMON: N: 39° 19' 53.1" W: 76° 32' 06.6" (+/- 19 ft)
RTMON: N: 39° 19' 52.3" W: 76° 32' 07.6" (+/- 19 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
LBMON	0.0	52.83	CS	35.0	49.17
LTMON	0.0	53.10	SL BRK	37.3	49.00
LBMON	0.0	52.83	SL BRK	38.8	48.67
GS	4.3	52.78	CS	42.0	48.54
LTOB	8.0	52.35	IP	44.0	48.07
CS	11.0	51.40	LEW	44.6	47.12
LBF	15.0	50.13	CS	44.6	46.98
CS	17.0	49.30	CS	46.8	46.59
CS	19.0	49.09	CS	49.0	46.74
CS	23.2	49.03	CS	52.0	46.49
CS	24.6	49.37	CS	54.0	46.54
CS	26.0	49.36	CS	56.0	46.33
CS	27.2	49.76	CS	58.0	46.43
CS	30.0	49.67	CS	60.0	46.30
CS	31.6	49.53	BPIN	61.6	46.20

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
TPIN	61.6	47.47	RTMON	84.0	52.24
BPIN	61.6	46.20	RBMON	84.0	52.24
TW	62.4	45.88			
UNDERCUT	63.3	45.88			
UNDERCUT	63.3	47.13			
REW	62.4	47.13			
IP	63.2	48.22			
SL BRK	64.3	48.64			
SL BRK	66.2	49.17			
RBF	69.1	49.96			
SL BRK	70.2	50.25			
RTOB	71.0	51.14			
GS	74.0	51.44			
GS	78.0	51.77			
RBMON	84.0	52.16			



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Path: CD Drive:\Moores Run\Data\Cross Sections
File: Reach 03 - BALT XS 28 Balt. City Datum
01/30/04

MOORES RUN - REACH 03

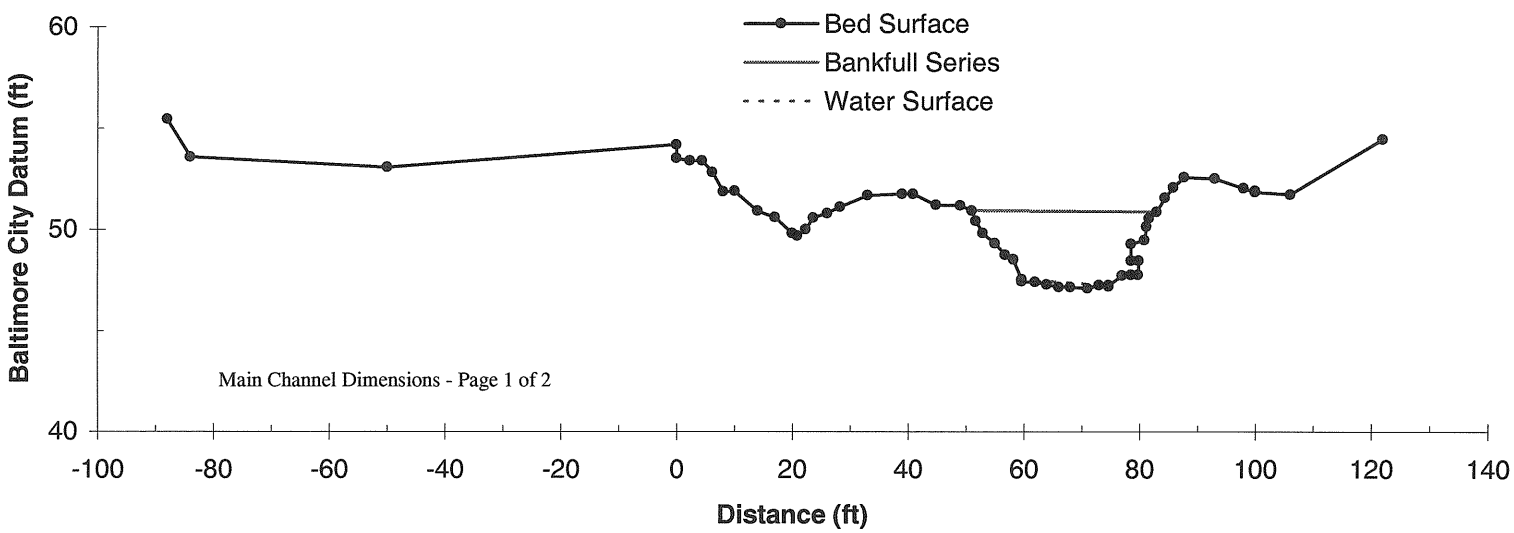
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
32.00	94.30	2.95	3.81	37.78	2.50	Bankfull
15.10	2.23	0.15	0.24	15.27	0.15	Water Surface

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

MON. COORD.: LMON: N: 39° 19' 53.5" W: 76° 32' 06.8" (+/- 27 ft)
RMON: N: 39° 19' 53.0" W: 76° 32' 08.0" (+/- 21 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
GS	-88.0	55.43	CS (OC)	23.6	50.57
GS	-84.0	53.59	CS (OC)	26.0	50.80
GS	-50.0	53.06	RTOB (OC)	28.3	51.11
LTMON	0.0	54.19	GS	33.0	51.67
LBMON	0.0	53.50	GS	39.0	51.75
GS	2.3	53.37	GS	40.9	51.74
GS	4.4	53.38	GS	44.8	51.19
GS	6.2	52.82	GS	49.0	51.18
GS	8.0	51.87	LBF	51.0	50.92
LTOB (OC)	10.0	51.89	SL BRK	51.7	50.41
CS (OC)	14.0	50.91	SL BRK	52.9	49.79
CS (OC)	17.0	50.58	SL BRK	55.0	49.28
CS (OC)	20.0	49.80	SL BRK	56.8	48.73
CS (OC)	20.9	49.68	IP	58.2	48.49
CS (OC)	22.3	49.98	LEW	59.6	47.51

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
TOE	59.6	47.41	SL BRK	80.9	49.46
CS	62.0	47.40	SL BRK	81.2	50.11
CS	64.0	47.27	SL BRK	81.6	50.52
CS	66.0	47.15	RBF	83.0	50.86
CS	68.0	47.15	SL BRK	84.4	51.56
CS	71.0	47.07	SL BRK	85.8	52.05
CS	73.0	47.24	RTOB	87.7	52.56
CS	74.7	47.18	GS	93.0	52.49
REW	74.7	47.23	GS	98.0	52.01
CS	77.0	47.72	RBMON	100.0	51.83
UNDERCUT	78.5	47.74	RTMON	100.0	51.89
UNDERCUT	79.7	47.74	RBMON	100.0	51.83
UNDERCUT	79.9	48.44	GS	106.0	51.71
UNDERCUT	78.5	48.44	GS	122.0	54.44
UNDERCUT	78.5	49.25			



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File: Reach 03 - USFWS XS A Balt. City Datum
01/30/04

MOORES RUN - REACH 03

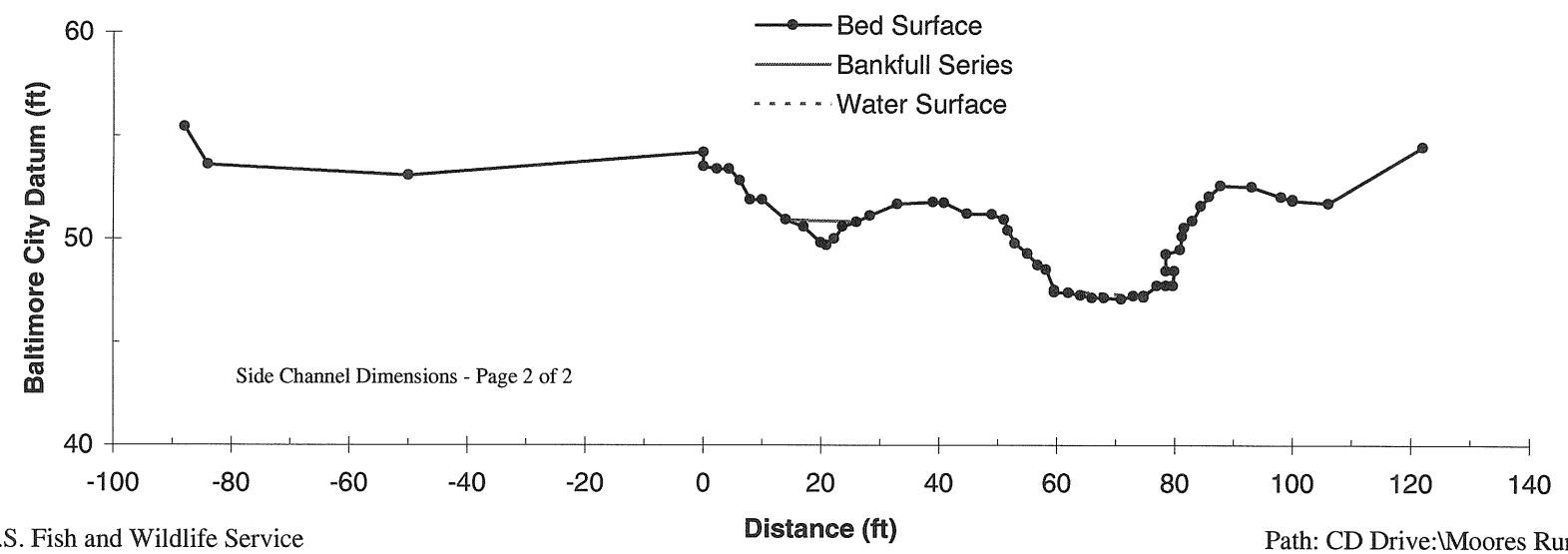
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
12.00	5.93	0.49	1.17	12.30	0.48	Bankfull
15.10	2.23	0.15	0.24	15.27	0.15	Water Surface

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

MON. COORD.: LMON: N: 39° 19' 53.5" W: 76° 32' 06.8" (+/- 21 ft)
RMON: N: 39° 19' 53.0" W: 76° 32' 08.0" (+/- 27 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
GS	-88.0	55.43	CS (OC)	23.6	50.57
GS	-84.0	53.59	RBF	26.0	50.80
GS	-50.0	53.06	RTOB (OC)	28.3	51.11
LTMON	0.0	54.19	GS	33.0	51.67
LBMON	0.0	53.50	GS	39.0	51.75
GS	2.3	53.37	GS	40.9	51.74
GS	4.4	53.38	GS	44.8	51.19
GS	6.2	52.82	GS	49.0	51.18
GS	8.0	51.87	SL BRK	51.0	50.92
LTOB (OC)	10.0	51.89	SL BRK	51.7	50.41
LBF	14.0	50.91	SL BRK	52.9	49.79
CS (OC)	17.0	50.58	SL BRK	55.0	49.28
CS (OC)	20.0	49.80	SL BRK	56.8	48.73
CS (OC)	20.9	49.68	IP	58.2	48.49
CS (OC)	22.3	49.98	LEW	59.6	47.51

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
TOE	59.6	47.41	SL BRK	80.9	49.46
CS	62.0	47.40	SL BRK	81.2	50.11
CS	64.0	47.27	SL BRK	81.6	50.52
CS	66.0	47.15	SL BRK	83.0	50.86
CS	68.0	47.15	SL BRK	84.4	51.56
CS	71.0	47.07	SL BRK	85.8	52.05
CS	73.0	47.24	RTOB	87.7	52.56
CS	74.7	47.18	GS	93.0	52.49
REW	74.7	47.23	GS	98.0	52.01
CS	77.0	47.72	RBMON	100.0	51.83
UNDERCUT	78.5	47.74	RTMON	100.0	51.89
UNDERCUT	79.7	47.74	RBMON	100.0	51.83
UNDERCUT	79.9	48.44	GS	106.0	51.71
UNDERCUT	78.5	48.44	GS	122.0	54.44
UNDERCUT	78.5	49.25			



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File: Reach 03 - USFWS XS A Balt. City Datum
01/30/04

MOORES RUN - REACH 03

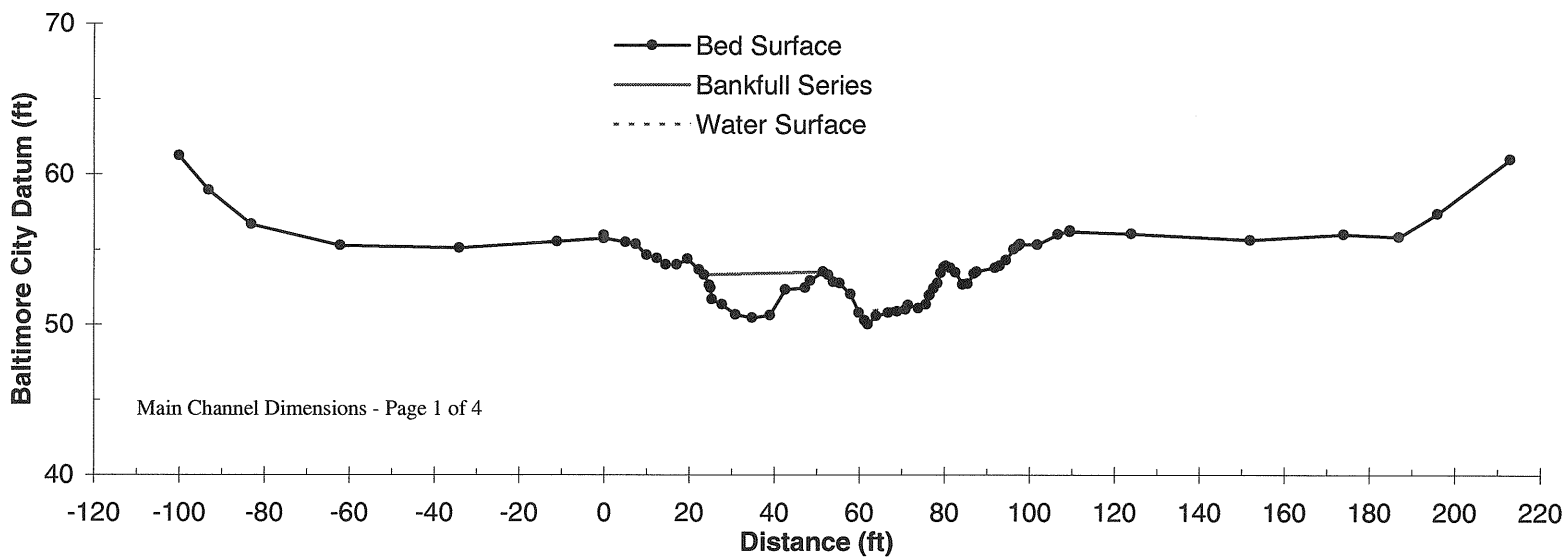
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)		
28.00	49.75	1.78	2.94	29.42	1.69	Bankfull	
15.80	4.22	0.27	0.86	16.16	0.26	Water Surface	

STREAM: Moores Run
REACH & XS: Reach 03 - Balt. XS 26 (Riffle)
DATE: 10/10/03
CREW: FWS (KR, SD)
DATA: KR
QA/QC: SLD

MON. COORD.: LTMON: N: 39° 19' 54.9" W: 76° 32' 07.7" (+/- 19 ft)
RTMON: N: 39° 19' 54.8" W: 76° 32' 09.0" (+/- 19 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
FT TERR	-100.0	61.21	SL BRK	19.7	54.36
TOE	-93.0	58.90	SL BRK	22.3	53.63
GS	-83.0	56.65	LBF	23.5	53.31
GS	-62.0	55.24	SL BRK	24.7	52.63
GS	-34.0	55.10	EW	25.0	52.45
GS	-11.0	55.53	CS	25.3	51.66
LBMON	0.0	55.74	CS	27.7	51.32
LTMON	0.0	55.93	CS	30.9	50.67
LBMON	0.0	55.74	TW	34.9	50.44
GS	5.0	55.49	CS	39.0	50.63
SL BRK	7.4	55.36	CS	42.6	52.33
TOE	10.0	54.61	EW	47.4	52.43
SL BRK	12.5	54.42	CS (BAR)	48.5	52.93
RLC CHAN	14.5	54.00	RBF	51.5	53.49
RLC CHAN	17.1	54.00	CS (BAR)	52.7	53.30

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
CS (BAR)	54.0	52.84	SL BRK	77.5	52.41
CS (BAR)	55.4	52.74	SL BRK	78.4	52.75
CS (BAR)	58.0	52.00	SL BRK	79.2	53.43
LEW	60.0	50.80	SL BRK	80.0	53.80
CS	61.3	50.26	RLC CHAN	80.5	53.88
TW	62.0	50.01	SL BRK	81.5	53.78
CS	64.0	50.59	SL BRK	82.7	53.48
CS	66.9	50.78	SL BRK	84.4	52.65
CS	69.0	50.86	RLC CHAN	85.5	52.71
CS	71.0	50.98	SL BRK	87.0	53.40
CS	71.6	51.31	SL BRK	87.6	53.52
CS	73.9	51.09	SL BRK	92.0	53.78
REW	75.8	51.34	SL BRK	93.0	53.89
SL BRK	76.5	51.92	SL BRK	94.5	54.27
SL BRK	76.7	51.99	SL BRK	96.3	54.99



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File: Reach 03 - BALT XS 26 Balt. City Datum
01/30/04

MOORES RUN - REACH 03

Identifier	Dist. (ft)	Elev.(ft)
ROOT	97.5	55.23
ROOT	97.9	55.34
SL BRK	102.0	55.31
SL BRK	106.8	55.97
RBMON	109.6	56.24
RTMON	109.6	56.17
RBMON	109.6	56.16
GS	124.0	56.02
GS	152.0	55.61
GS	174.0	55.97
GS	187.0	55.80
GS	196.0	57.35
GS	213.0	60.96
Main Channel Dimensions - Page 2 of 4		

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File: Reach 03 - BALT XS 28 Balt. City Datum
01/30/04

MOORES RUN - REACH 03

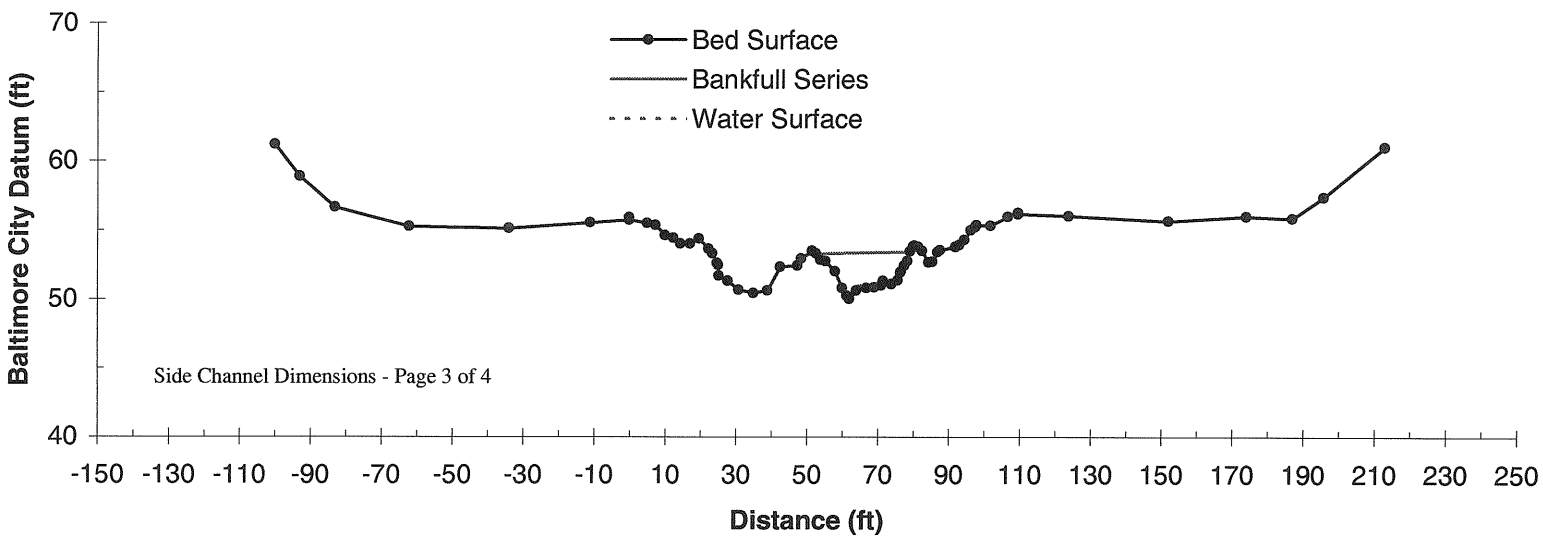
Width (ft)	Cross-Sectional Area (Sq.ft)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	
26.50	51.54	1.94	3.34	28.01	1.84	Bankfull
15.80	4.22	0.27	0.86	16.16	0.26	Water Surface

STREAM: Moores Run
REACH & XS: Reach 03 - Balt. XS 26 (Riffle)
DATE: 10/10/03
CREW: FWS (KR, SD)
DATA: KR
QA/QC: SLD

MON. COORD.: LTMON: N: 39° 19' 54.9" W: 76° 32' 07.7" (+/- 19 ft)
RTMON: N: 39° 19' 54.8" W: 76° 32' 09.0" (+/- 19 ft)

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
FT TERR	-100.0	61.21	SL BRK	19.7	54.36
TOE	-93.0	58.90	SL BRK	22.3	53.63
GS	-83.0	56.65	SL BRK	23.5	53.31
GS	-62.0	55.24	SL BRK	24.7	52.63
GS	-34.0	55.10	EW	25.0	52.45
GS	-11.0	55.53	CS	25.3	51.66
LBMON	0.0	55.74	CS	27.7	51.32
LTMON	0.0	55.93	CS	30.9	50.67
LBMON	0.0	55.74	TW	34.9	50.44
GS	5.0	55.49	CS	39.0	50.63
SL BRK	7.4	55.36	CS	42.6	52.33
TOE	10.0	54.61	EW	47.4	52.43
SL BRK	12.5	54.42	CS (BAR)	48.5	52.93
RLC CHAN	14.5	54.00	CS (BAR)	51.5	53.49
RLC CHAN	17.1	54.00	LBF	52.7	53.30

Identifier	Distance (ft)	Elevation (ft)	Identifier	Distance (ft)	Elevation (ft)
CS (BAR)	54.0	52.84	SL BRK	77.5	52.41
CS (BAR)	55.4	52.74	SL BRK	78.4	52.75
CS (BAR)	58.0	52.00	RBF	79.2	53.43
LEW	60.0	50.80	SL BRK	80.0	53.80
CS	61.3	50.26	RLC CHAN	80.5	53.88
TW	62.0	50.01	SL BRK	81.5	53.78
CS	64.0	50.59	SL BRK	82.7	53.48
CS	66.9	50.78	SL BRK	84.4	52.65
CS	69.0	50.86	RLC CHAN	85.5	52.71
CS	71.0	50.98	SL BRK	87.0	53.40
CS	71.6	51.31	SL BRK	87.6	53.52
CS	73.9	51.09	SL BRK	92.0	53.78
REW	75.8	51.34	SL BRK	93.0	53.89
SL BRK	76.5	51.92	SL BRK	94.5	54.27
SL BRK	76.7	51.99	SL BRK	96.3	54.99



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File: Reach 03 - BALT XS 26 Balt. City Datum
01/30/04

MOORES RUN - REACH 03

Identifier	Dist. (ft)	Elev.(ft)
ROOT	97.5	55.23
ROOT	97.9	55.34
SL BRK	102.0	55.31
SL BRK	106.8	55.97
RBMON	109.6	56.24
RTMON	109.6	56.17
RBMON	109.6	56.16
GS	124.0	56.02
GS	152.0	55.61
GS	174.0	55.97
GS	187.0	55.80
GS	196.0	57.35
GS	213.0	60.96
Side Channel Dimensions - Page 4 of 4		

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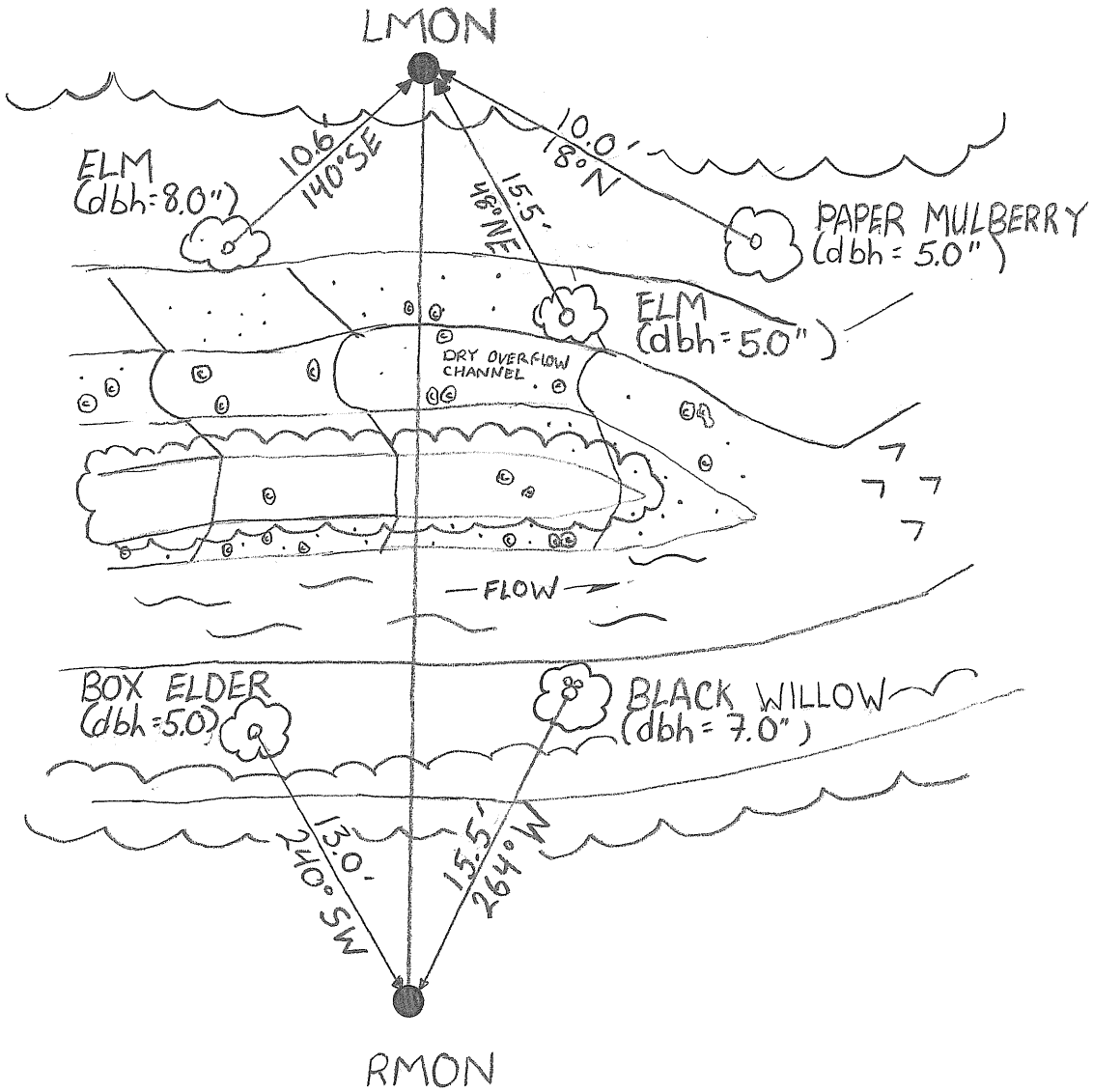
Path: Cd Drive:\Moores Run\Data\Cros Sections
File: Reach 03 - BALT XS 28 Balt. City Datum
01/30/04

Moores Run
Reach 03
Baltimore Cross Section 28
(Stream Feature: Run)

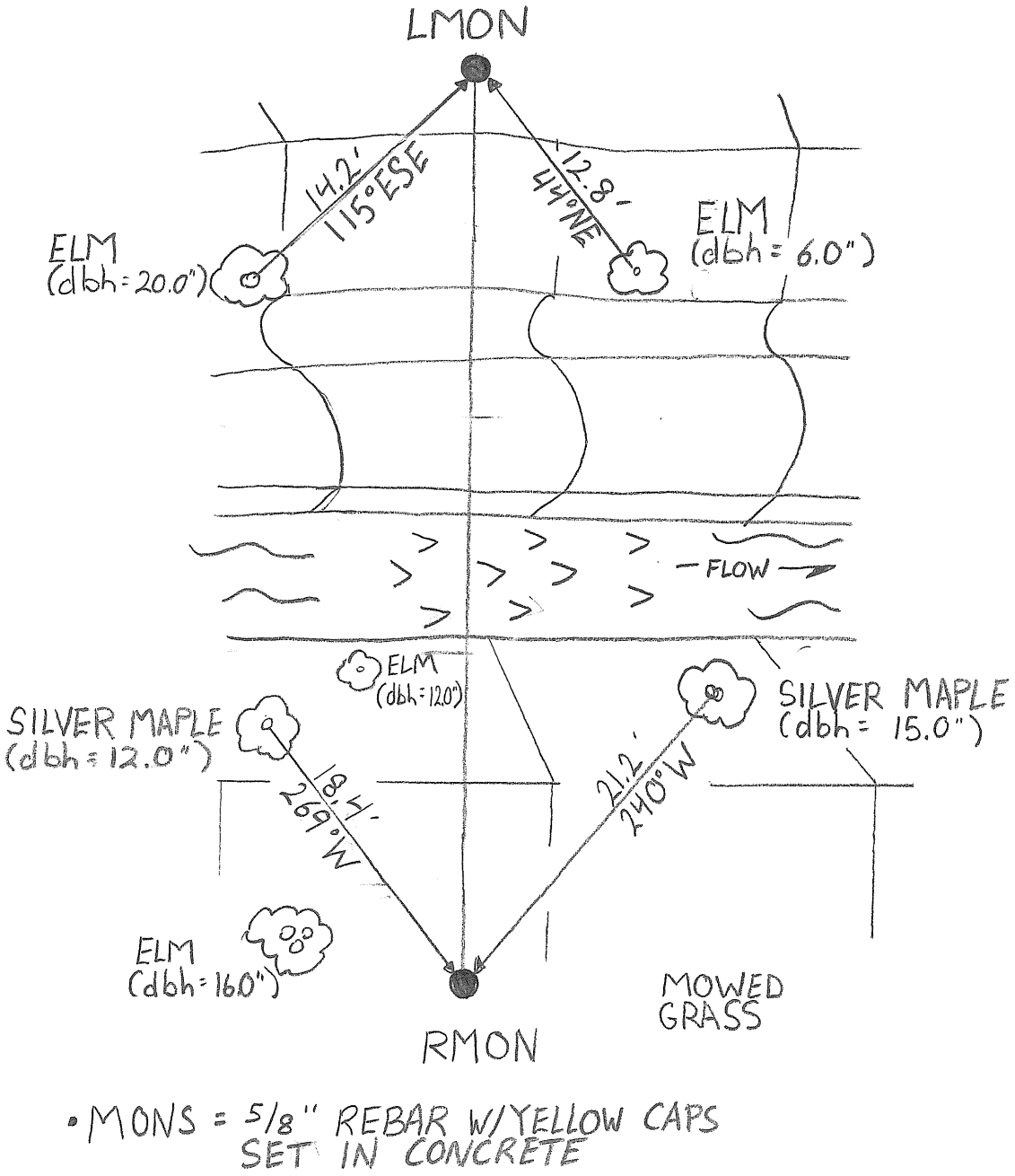
Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

Moores Run
Reach 03
USFWS Cross Section A
(Stream Feature: Riffle)

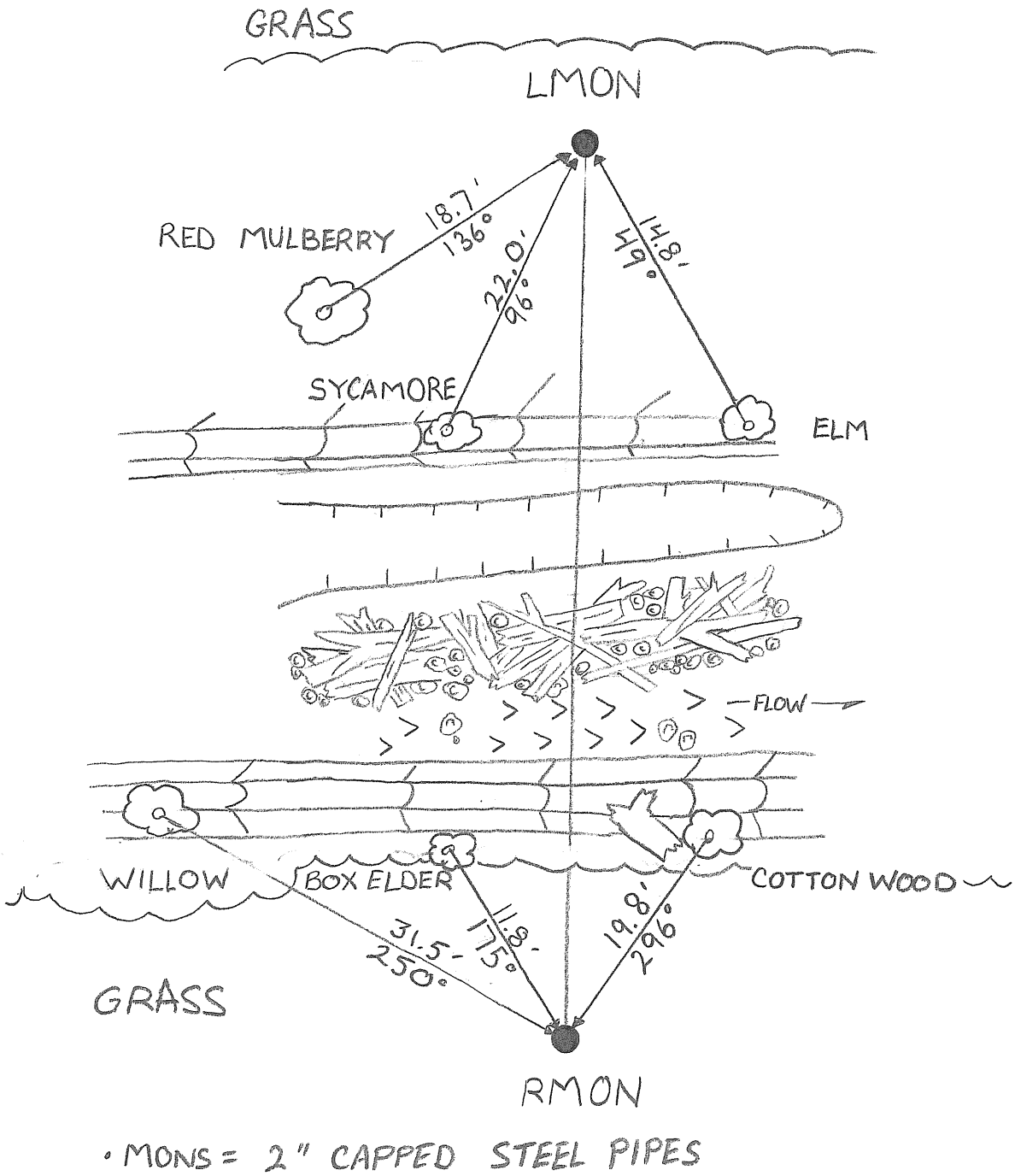
Cross-Section Monument Map



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

Moores Run
Reach 03
Baltimore Cross Section 26
(Stream Feature: Riffle)

Cross-Section Monument Map



• MONS = 2" CAPPED STEEL PIPES

MOORES RUN - REACH 03

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:**	17.20
Reach:	03	**Comments:**	GPS Coordinates:						Low
Location:	BALT XS 28		LMON: N: 39° 19' 53.1" W: 76° 32' 06.6" (+/- 19 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
5.50	4.00	1.38	5.11	Moderate	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
3.50	5.50	0.64	3.24	Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
80.00	0.64	50.91	4.24	Moderate	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
20.00			1.90	Very Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
70.00			2.71	Low	
			Adjustment		Notes
Bank Materials			0.00		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**17.20**		

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

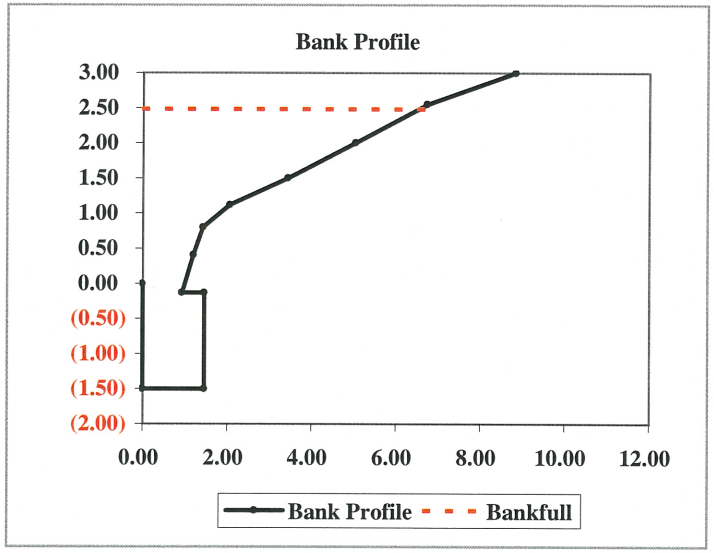
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

Horizontal Distance	Vertical Height	Notes
0.00	0.00	TOE PIN
0.00	(1.50)	CS
1.46	(1.50)	CS
1.46	(0.13)	SLP BRK
0.94	(0.13)	SLP BRK
1.20	0.41	SLP BRK
1.43	0.80	SLP BRK
2.06	1.12	SLP BRK
3.44	1.50	SLP BRK
5.04	2.00	SLP BRK
6.74	2.55	SLP BRK
8.83	3.00	SLP BRK
8.86	3.80	SLP BRK
9.78	4.00	SLP BRK

Bankfull

Horizontal Distance	Vertical Height	Notes
0.00	2.49	
6.70	2.49	



MOORES RUN - REACH 03

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:**	**26.89**
Reach:	03	**Comments:**	GPS Coordinates:						**Moderate**
Location:	USFWS XS A - RIGHT CHANNEL		LMON: N: 39° 19' 53.5" W: 76° 32' 06.8" (+/- 21 feet)					**Notes:**	RIGHT BANK
Date:	1/12/04		RMON: N: 39° 19' 53.0" W: 76° 32' 08.0" (+/- 27 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
4.82	3.12	1.54	6.18	High	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
4.12	4.82	0.85	2.17	Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
60.00	0.85	51.29	4.21	Moderate	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
122.00			10.00	Extreme	
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	**26.89**		

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

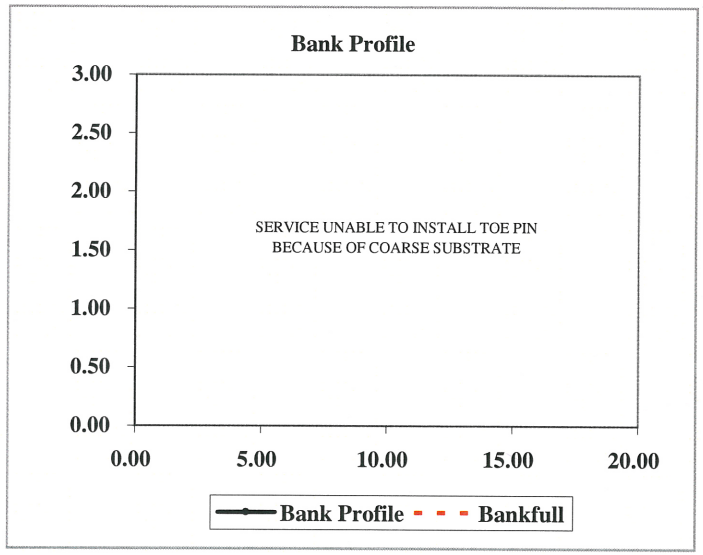
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

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

Bankfull

Horizontal Distance	Vertical Height	Notes



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Chesapeake Bay Field Office

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File:Reach 03 - USFWS XS A (Right Channel - RB)
01/29/04

MOORES RUN - REACH 03

BANK PROFILE AND BANK EROSION HAZARD INDEX FOR MONUMENTED CROSS SECTION

Stream:	MOORES RUN, BALTIMORE, MD	**Observer(s):**	RS	**Data:**	CE	**QA/QC:**	SLD	**Total Score:**	13.32
Reach:	03	**Comments:**	GPS Coordinates:						**Low**
Location:	BALT XS 26 - LEFT CHANNEL		LMON: N: 39° 19' 54.9" W: 76° 32' 07.7" (+/- 19 feet)					**Notes:**	LEFT BANK
Date:	3/17/04		RMON: N: 39° 19' 54.8" W: 76° 32' 09.0" (+/- 19 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
1.70	1.70	1.00	1.00	Very Low	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
0.90	1.70	0.53	3.76	Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
80.00	0.53	42.35	4.92	Moderate	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
25.00			2.19	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
90.00			1.45	Very Low	
			Adjustment		Notes
Bank Materials			0.00		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**13.32**		

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

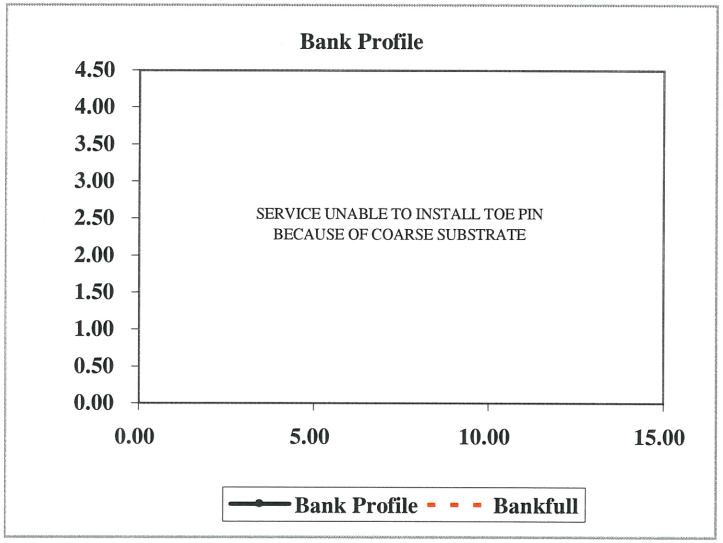
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

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

Bankfull

Horizontal Distance	Vertical Height	Notes



No Picture

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Chesapeake Field Office

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File: Reach 03 - BALT XS 26 (Left Channel - LB)
01/29/04

MOORES RUN - REACH 03

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:**	**21.49**
Reach:	03	**Comments:**	GPS Coordinates:						**Moderate**
Location:	BALT XS 26 - RIGHT CHANNEL		LMON: N: 39° 19' 54.9" W: 76° 32' 07.7" (+/- 19 feet)					**Notes:**	RIGHT BANK
Date:	10/10/03		RMON: N: 39° 19' 54.8" W: 76° 32' 09.0" (+/- 19 feet)						

Erodibility Variables

Bank Height / Bankfull Height Ratio					
Bank Height	Bankfull Height	Value	Index	Bank Erosion Potental	Notes
1.96	1.51	1.30	4.62	Moderate	
Root Depth / Bank Height Ratio					
Root Depth	Bank Height	Value	Index	Bank Erosion Potental	Notes
1.96	1.96	1.00	1.00	Very Low	
Weighted Root Density					
Root Density (%)	Root Depth / Bank Height	Value	Index	Bank Erosion Potental	Notes
60.00	1.00	60.00	3.50	Low	
Bank Angle					
Bank Angle (°)			Index	Bank Erosion Potental	Notes
49.00			3.36	Low	
Surface Protection					
Surface Protection (%)			Index	Bank Erosion Potental	Notes
10.00			9.00	Very High	
			Adjustment		Notes
Bank Materials			0.00		
			Adjustment		Notes
Bank Stratification			0.00		
		TOTAL SCORE	**21.49**		

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

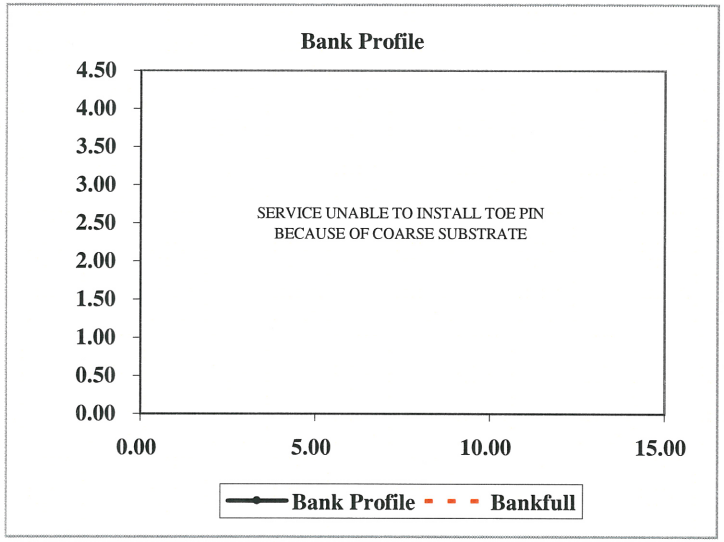
Add 5-10 points depending on position of unstable layers in relation to bankfull stage.

Bank Profile

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

Bankfull

Horizontal Distance	Vertical Height	Notes



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File: Reach 03 - BALT XS 26 (Right Channel - RB)
01/29/04

MOORES RUN - REACH 03

MODIFIED PFANKUCH STREAM REACH INVENTORY AND CHANNEL STABILITY EVALUATION

Stream:	Moores Run	**Observer(s):**	TLM	**Ex. Stream Type:**	D	**Ref. Stream Type:**	C3
Reach:	3	**Comments:**	Braided on left side	**Grand Total:**	94.00		
Location:	Baltimore City, MD			**Stability Rating:**	Fair		
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	5	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	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		Moderate to heavy amounts, mostly larger sizes.	6	5	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		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	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		Significant. Cuts 12-24" high. Root mat overhangs and sloughing evident.	12	9	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16	
	9	Deposition	Little or no enlargement of channel or point bars.	4		Some new bar increase, mostly from coarse gravel.	8	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		30-50% affected. Deposits and scour at obstructions, constriction and bends. Some filling of pools.	18	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	**5**		**Good Total**	**21**		**Fair Total**	**55**		**Poor Total**	**13**

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+