

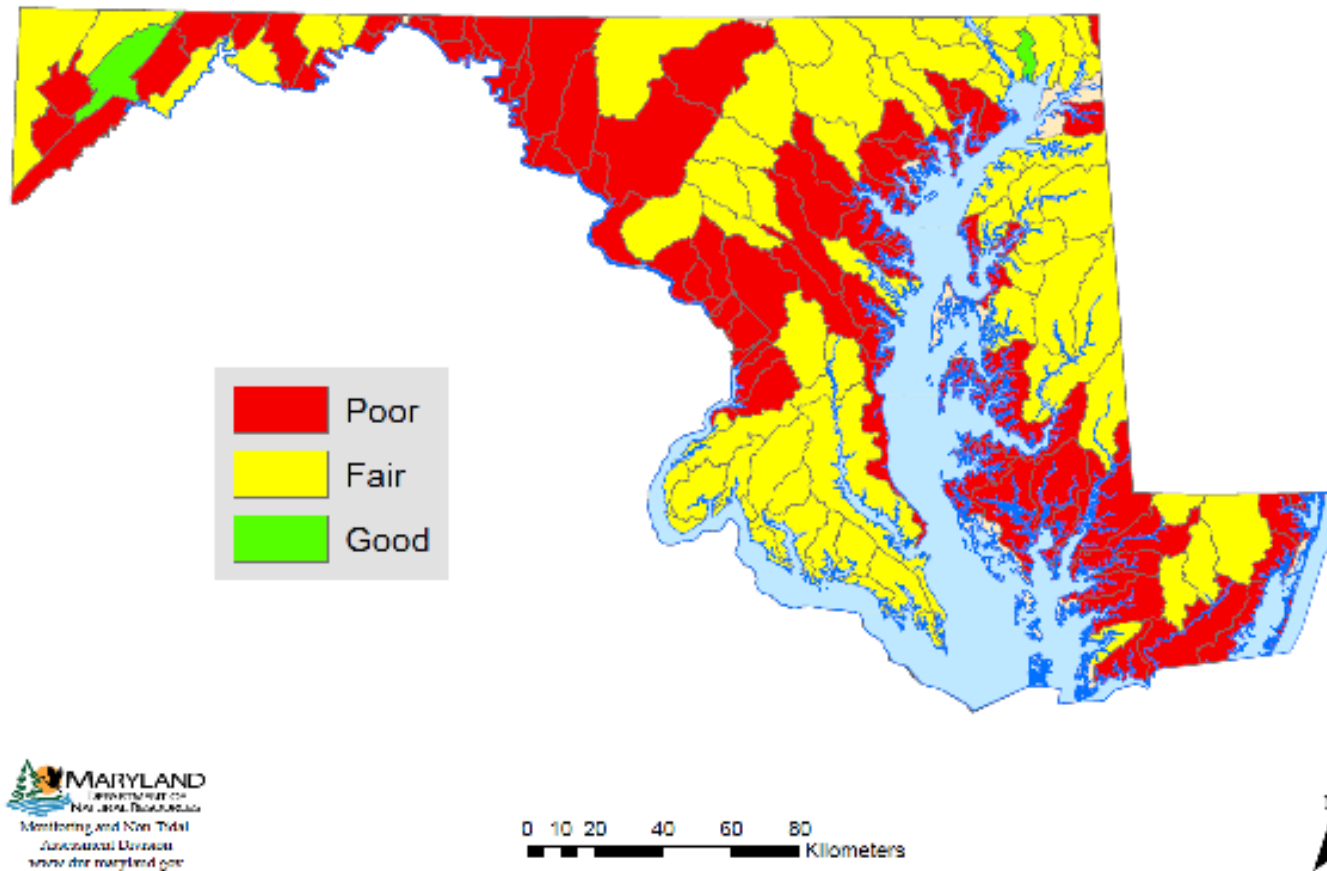
Deep Creek Lake
Water Quality Subcommittee
April 17, 2014

Maryland Biological Stream Survey

- Snapshot of stream health from biological indicators



Maryland's Watershed Health





MARYLAND DEPARTMENT OF NATURAL RESOURCES

Stream Corridor Assessments

What is a Stream Corridor Assessment?

- Watershed Management Tool
- Refinement of earlier “stream walk surveys”
- Identify physical conditions that may affect stream health



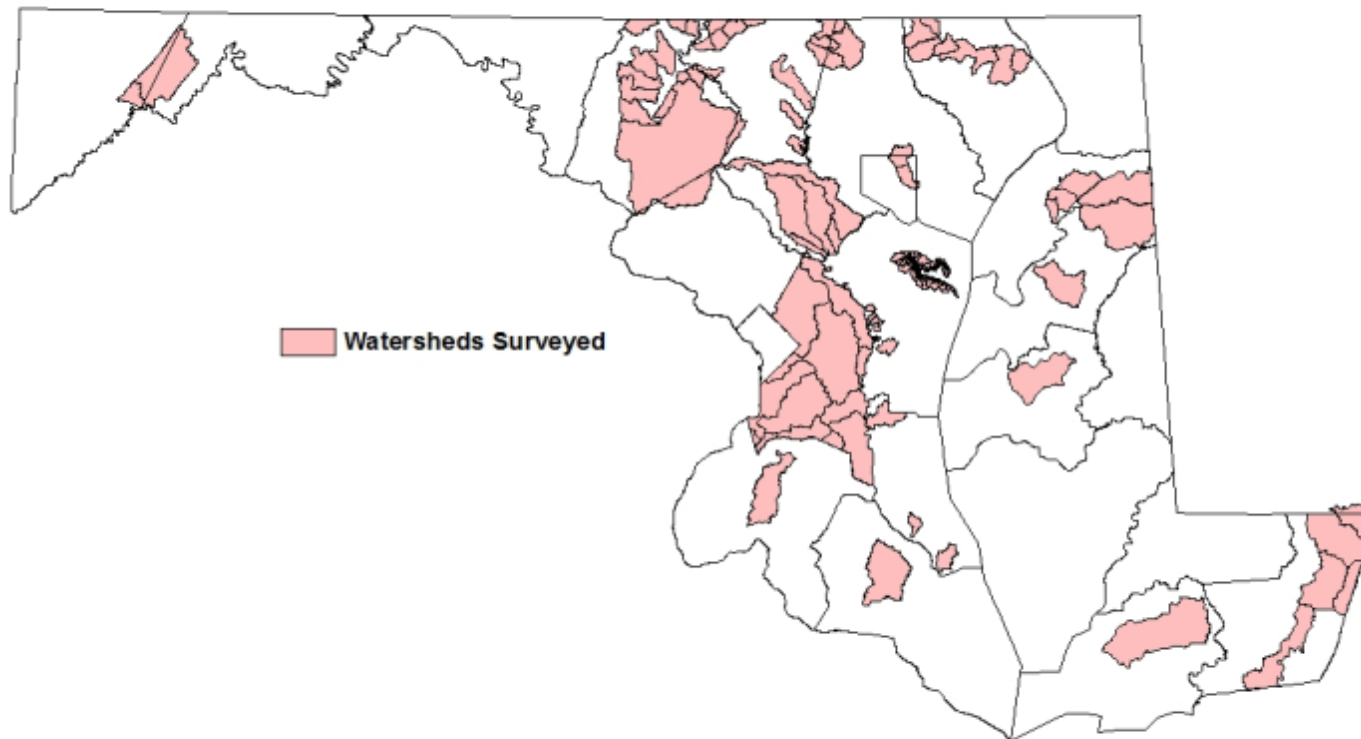
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Stream Corridor Assessments

Stream Corridor Assessment Survey Goals

- Provide a list of observable environmental problems within a stream system
- Provide sufficient information to determine severity and correctability of a problem
- Provide information to prioritize restoration projects
- Assess in/near stream habitat to compare the condition of different stream segments

Stream Corridor Assessments



Environmental Problems

- Channel Alteration
- Exposed Pipes
- Erosion
- Fish Barriers
- Inadequate Buffer
- Pipe Outfalls
- Trash Dumping
- Other Unusual Conditions
Acid Mine Drainage, Iron Bacteria, etc.

Survey Protocols

- Determine Survey Area and Access
 - Obtain Landowner Permissions
- Collect data
 - Handheld GPS Technology
 - Data sheets, maps pre-loaded
- Process data
 - Consolidate and QC Field Data
 - Geo-reference photos



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Stream Corridor Assessments

INADEQUATE BUFFER

IB

Map: _____

Team: _____

Site: _____

Date: ____ / ____ / ____
MM DD YY

Photo: _____

Survey: _____

Buffer inadequate on: Left Right Both (looking downstream)

Is stream unshaded? Left Right Both (looking downstream) Neither

Buffer width left: _____ ft. Buffer width right: _____ ft.

Length left: _____ ft. Length right: _____ ft.

Present land use left side: Crop field, Pasture, Lawn, Paved, Shrubs & Small Trees, Forest, Multiflora Rose, Other _____

Present land use right side: Crop field, Pasture, Lawn, Paved, Shrubs & Small Trees, Forest, Multiflora Rose, Other _____

Has a buffer recently been established: Yes No

Are Livestock present: Yes No Type: Cattle, Horses, Pigs, Other: _____

Severity Severe 1 2 3 4 5 Minor Unknown (-1)

Correctability Best 1 2 3 4 5 Worst Unknown (-1)

Access Best 1 2 3 4 5 Worst Unknown (-1)

Wetland Potential Best 1 2 3 4 5 Worst Unknown (-1)

(Good wetland potential = low slope, low bank height)



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Stream Corridor Assessments

EROSION SITE

ES

Map: _____ Team: _____ Site: _____

Date: ____/____/____ Photo: _____ Survey: _____
MM DD YY

Type: Downcutting Widening Headcutting Unknown

Cause: Bend at steep slope, Pipe Outfall, Below Channelization, Below Road Crossing,
 Livestock, Land Use Change Upstream, Other: _____

Length: _____ ft. Average exposed bank height: _____ ft.

Present Land Use Left Side (looking downstream): Crop field, Pasture, Lawn, Paved, Shrubs & Small Trees,
 Forest, Multiflora Rose, Other _____

Present Land Use Right Side (looking downstream): Crop field, Pasture, Lawn, Paved, Shrubs & Small Trees,
 Forest, Multiflora Rose, Other _____

Threat to Infrastructure?: Yes No Describe: _____

Severity	Severe	1	2	3	4	5	Minor	Unknown (-1)
Correctability	Best	1	2	3	4	5	Worst	Unknown (-1)
Access	Best	1	2	3	4	5	Worst	Unknown (-1)

Channel Alteration



Exposed Pipe



Erosion



Fish Barrier



Inadequate Buffer



Pipe Outfall



Trash Dumping

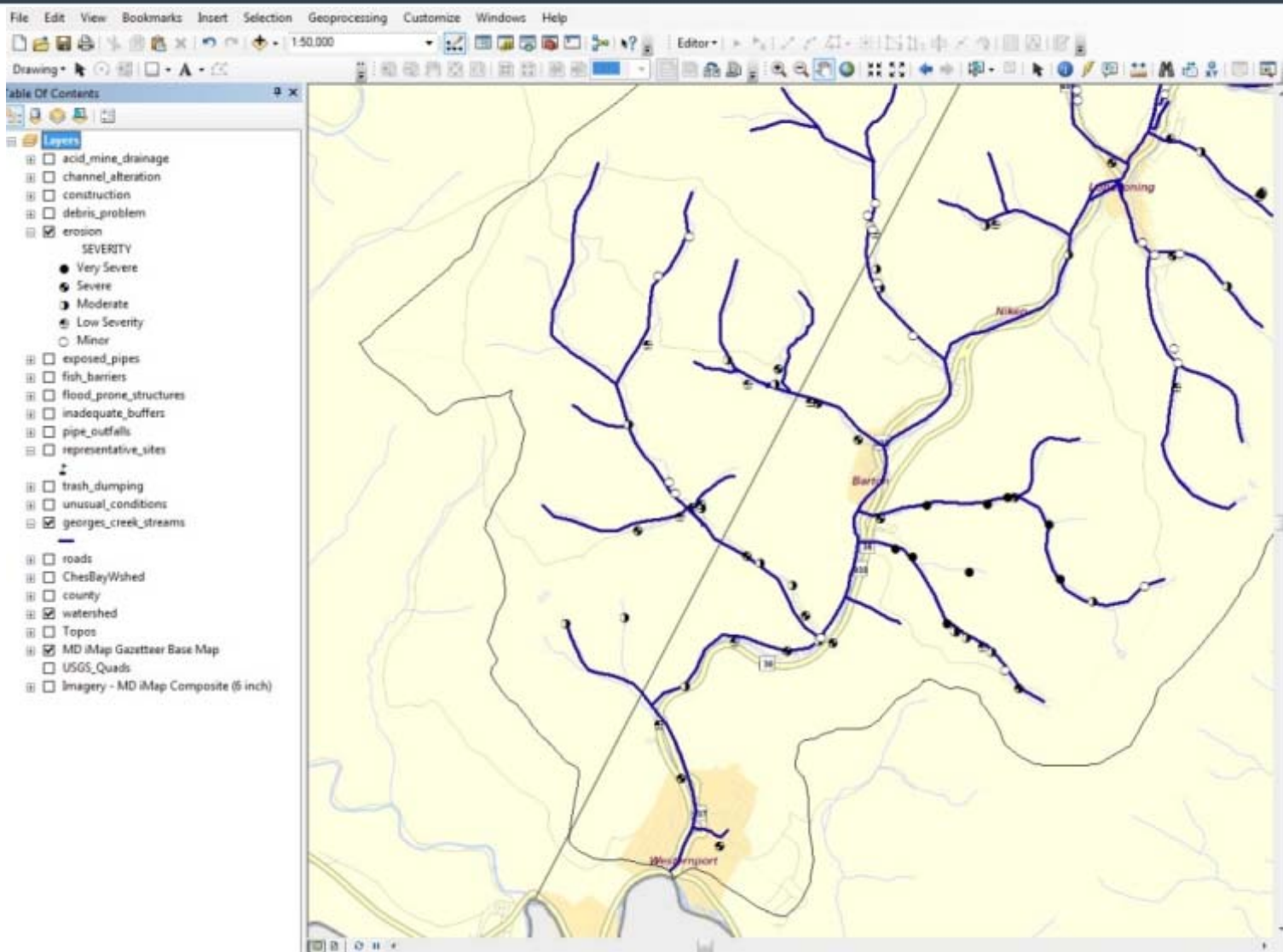


Unusual Condition



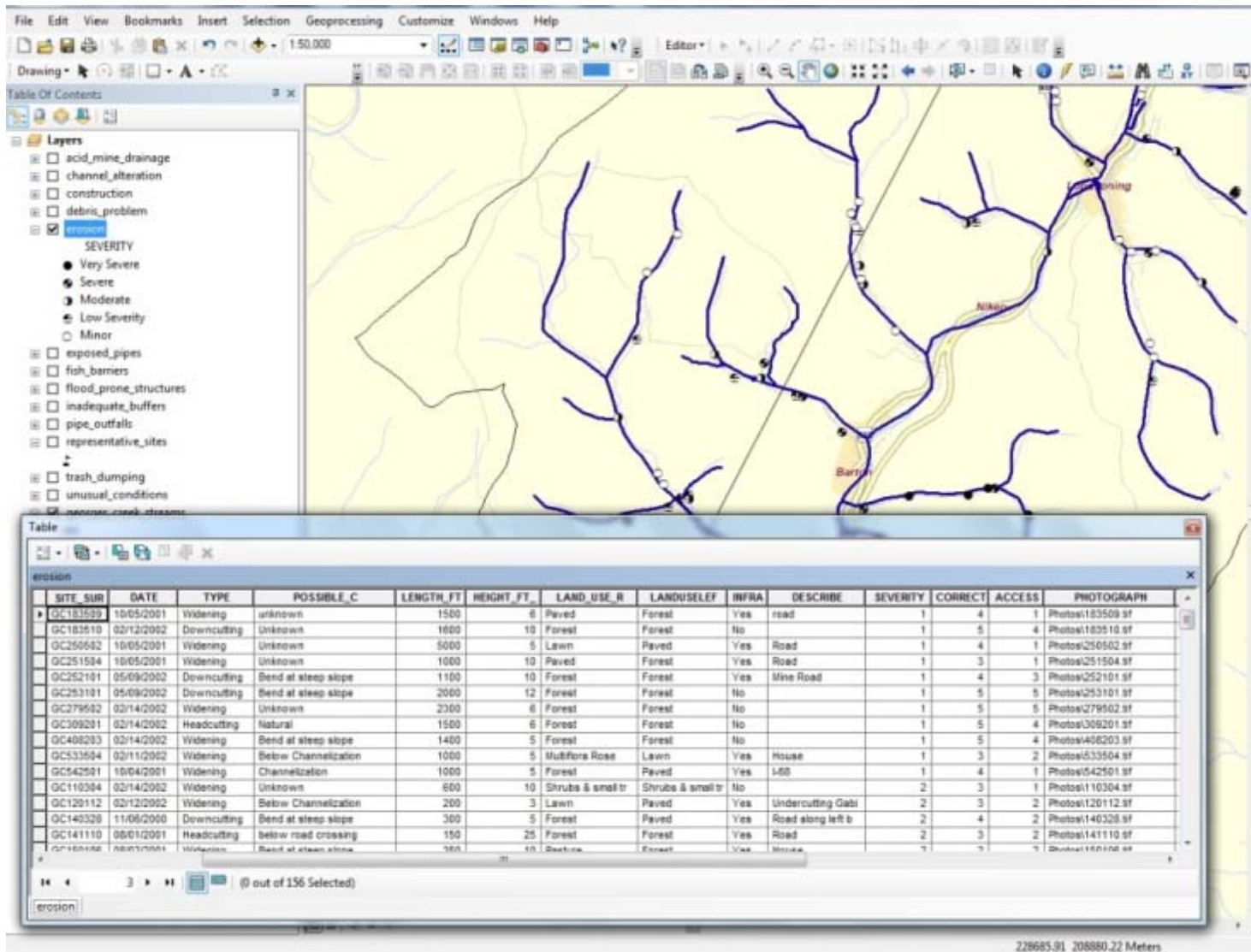
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Stream Corridor Assessments



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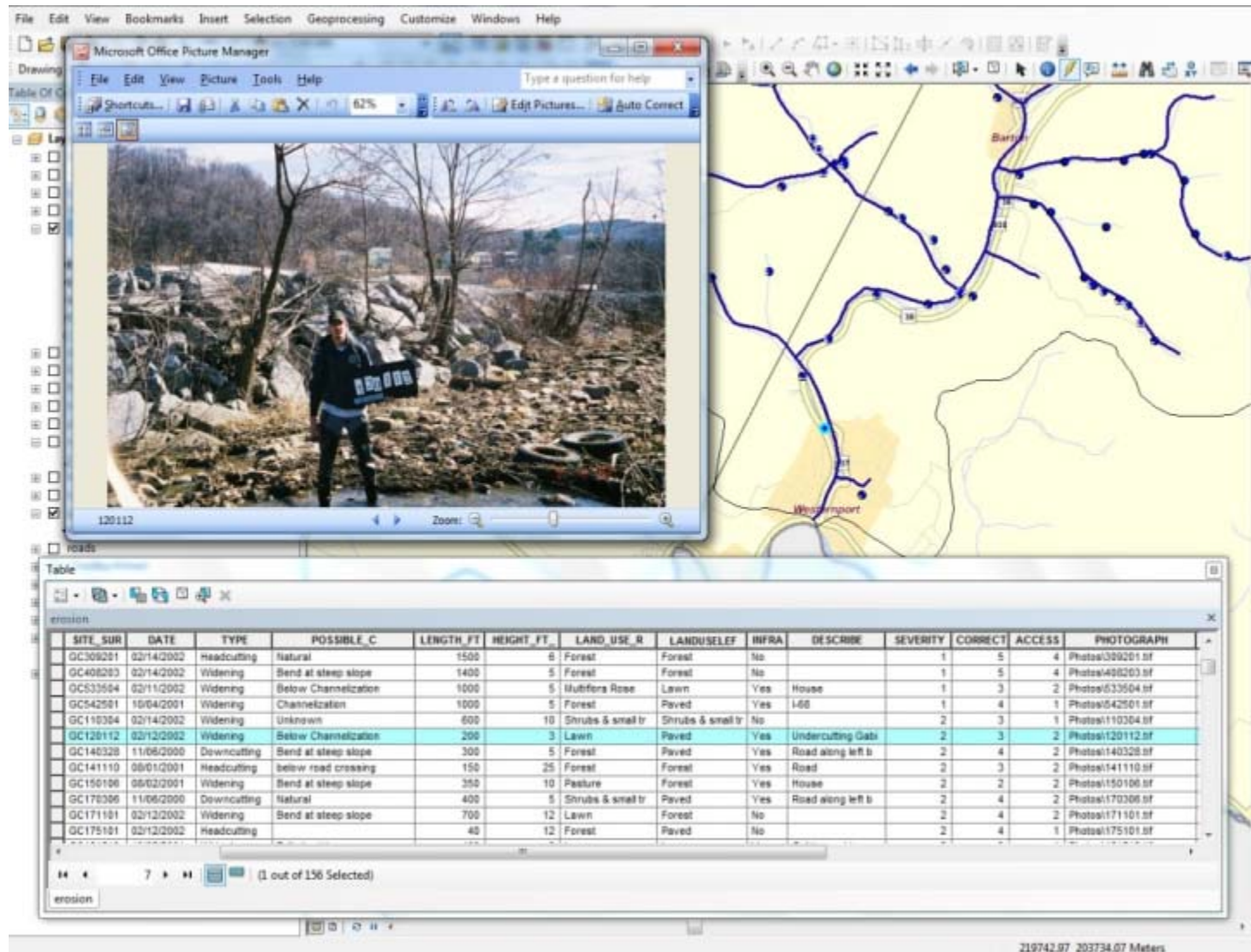
Stream Corridor Assessments



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Stream Corridor Assessments



SITE_SUR	DATE	TYPE	POSSIBLE_C	LENGTH_FT	HEIGHT_FT	LAND_USE_R	LANDUSELEF	INFRA	DESCRIBE	SEVERITY	CORRECT	ACCESS	PHOTOGRAPH
GC309201	02/14/2002	Headcutting	Natural	1500	8	Forest	Forest	No		1	5	4	Photo\309201.tif
GC408203	02/14/2002	Widening	Bend at steep slope	1400	5	Forest	Forest	No		1	5	4	Photo\408203.tif
GC533504	02/11/2002	Widening	Below Channelization	1000	5	Multiflora Rose	Lawn	Yes	House	1	3	2	Photo\533504.tif
GC542501	10/04/2001	Widening	Channelization	1000	5	Forest	Paved	Yes	I-60	1	4	1	Photo\542501.tif
GC110304	02/14/2002	Widening	Unknown	600	10	Shrubs & small tr	Shrubs & small tr	No		2	3	1	Photo\110304.tif
GC120112	02/12/2002	Widening	Below Channelization	200	3	Lawn	Paved	Yes	Undercutting Gabi	2	3	2	Photo\120112.tif
GC140328	11/08/2000	Downcutting	Bend at steep slope	300	5	Forest	Paved	Yes	Road along left b	2	4	2	Photo\140328.tif
GC141110	08/01/2001	Headcutting	below road crossing	150	25	Forest	Forest	Yes	Road	2	3	2	Photo\141110.tif
GC150106	05/02/2001	Widening	Bend at steep slope	350	10	Pasture	Forest	Yes	House	2	2	2	Photo\150106.tif
GC170306	11/06/2000	Downcutting	Natural	400	5	Shrubs & small tr	Paved	Yes	Road along left b	2	4	2	Photo\170306.tif
GC171101	02/12/2002	Widening	Bend at steep slope	700	12	Lawn	Forest	No		2	4	2	Photo\171101.tif
GC175101	02/12/2002	Headcutting		40	12	Forest	Paved	No		2	4	1	Photo\175101.tif



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Stream Corridor Assessments

Prioritize Restoration Projects

SITE SUR	TYPE	POSSIBLE C	LENGT	HEIGHT	LAND USE R	LANDUSELEF	INFRA	DESCRIBE	SEVERITY	CORRECT	ACCESS	PHOTOGRAPH
GC181711	Downcutting	Land use change upstrea	1600	7	Forest	Forest	Yes	House on ri	1	5	2	Photos\181711.tif
GC183503	Widening	Land use change upstrea	1500	5	Forest	Forest	No		1	3	2	Photos\183503.tif
GC183509	Widening	unknown	1500	6	Paved	Forest	Yes	road	1	4	1	Photos\183509.tif
GC183510	Downcutting	Unknown	1600	10	Forest	Forest	No		1	5	4	Photos\183510.tif
GC250502	Widening	Unknown	5000	5	Lawn	Paved	Yes	Road	1	4	1	Photos\250502.tif
GC251504	Widening	Unknown	1000	10	Paved	Forest	Yes	Road	1	3	1	Photos\251504.tif
GC252101	Downcutting	Bend at steep slope	1100	10	Forest	Forest	Yes	Mine Road	1	4	3	Photos\252101.tif
GC253101	Downcutting	Bend at steep slope	2000	12	Forest	Forest	No		1	5	5	Photos\253101.tif
GC279502	Widening	Unknown	2300	6	Forest	Forest	No		1	5	5	Photos\279502.tif
GC309201	Headcutting	Natural	1500	6	Forest	Forest	No		1	5	4	Photos\309201.tif
GC408203	Widening	Bend at steep slope	1400	5	Forest	Forest	No		1	5	4	Photos\408203.tif
GC533504	Widening	Below Channelization	1000	5	Multiflora Rose	Lawn	Yes	House	1	3	2	Photos\533504.tif
GC542501	Widening	Channelization	1000	5	Forest	Paved	Yes	I-68	1	4	1	Photos\542501.tif
GC110304	Widening	Unknown	600	10	Shrubs & small tr	Shrubs & small tr	No		2	3	1	Photos\110304.tif
GC120112	Widening	Below Channelization	200	3	Lawn	Paved	Yes	Undercuttin	2	3	2	Photos\120112.tif
GC140328	Downcutting	Bend at steep slope	300	5	Forest	Paved	Yes	Road along	2	4	2	Photos\140328.tif
GC141110	Headcutting	below road crossing	150	25	Forest	Forest	Yes	Road	2	3	2	Photos\141110.tif
GC150106	Widening	Bend at steep slope	350	10	Pasture	Forest	Yes	House	2	2	2	Photos\150106.tif
GC170306	Downcutting	Natural	400	5	Shrubs & small tr	Paved	Yes	Road along	2	4	2	Photos\170306.tif
GC171101	Widening	Bend at steep slope	700	12	Lawn	Forest	No		2	4	2	Photos\171101.tif
GC175101	Headcutting		40	12	Forest	Paved	No		2	4	1	Photos\175101.tif
GC181513	Widening	Failed gabion	100	6	Lawn	Lawn	Yes	Gabion and	2	3	1	Photos\181513.tif
GC191910	Downcutting	unknown	500	15	Forest	Shrubs & small tr			2	3	3	Photos\191910.tif
GC192903	Downcutting	Flooding	500	10	Lawn	Lawn			2	3	3	Photos\192903.tif
GC241505	Widening	Unknown	120	6	Forest	Forest	No		2	5	5	Photos\241505.tif
GC242502	Widening	Below road crossing	2600	3	Forest	Forest	Yes	Road	2	5	5	Photos\242502.tif
GC251503	Widening	Bend at steep slope	25	7	Paved	Forest	Yes	Road on Ri	2	2	1	Photos\251503.tif
GC320208	Widening	Bend at steep slope	40	14	Forest	Forest	No		2	5	5	Photos\320208.tif
GC370407	Widening	Bend at steep slope	100	50	Forest	Forest	No		2	5	3	Photos\370407.tif
GC380437	Widening	flooding	100	10	Paved	Paved	Yes	buildings, ro	2	5	4	Photos\380437.tif
GC382403	Headcutting	Below road crossing	50	5	Pasture	Paved	Yes	Road	2	3	2	Photos\382403.tif
GC480407	Downcutting	Washed out road crossin	50	2	Forest	Forest	Yes	Road	2	4	2	Photos\480407.tif
GC545615	Widening	Bend at steep slope	100	60	Forest	Forest	No		2	4	3	Photos\545615.tif
GC552707	Downcutting	Below channelization	600	12	Forest	Shrubs & small tr	No		2	5	2	Photos\552707.tif
GC555502	Widening	Unknown	150	10	Forest	Paved	Yes	Road, Fillin	2	3	2	Photos\555502.tif
GC555533	Widening	Below channelization	200	4	Forest	Paved	Yes	Road I-68	2	4	1	Photos\555533.tif
GC600102	Downcutting	Bend at steep slope	300	6	Lawn	Paved	No		2	3	1	Photos\600102.tif
NR100121	Downcutting		800	15	Shrubs & small tr	Lawn	No		2	3	1	Photos\NR100121.tif
GC130104	Widening	Bend at steep slope	800	10	Paved	Forest	No		3	4	2	Photos\130104.tif
GC132402	Widening	Unknown	700	5	Forest	Forest	No		3	5	5	Photos\132402.tif
GC132405	Widening	Ending of old mine talings	500	10	Forest	Forest	No		3	5	5	Photos\132405.tif
GC140326	Widening	Bend at steep slope	500	7	Lawn	Forest	No		3	5	3	Photos\140326.tif
GC141101	Widening	Bend at steep slope	400	20	Forest	Lawn	No		3	3	4	Photos\141101.tif

(0 out of 156 Selected)



**Sawmill Creek
Erosion Site (Before)**



**Sawmill Creek
Erosion Site (After)**



**Sawmill Creek
Erosion Site (After)**



Little Paint Branch Erosion Site (Before)



Little Paint Branch Erosion Site (After)



Dark Branch (Before)



Dark Branch (After)



Little Paint Branch Channel Alteration (Before)



Little Paint Branch Channel Alteration (After)



Piney Run Channel Alteration (Before)



Piney Run Channel Alteration (After)



Little Paint Branch Exposed Pipe (Before)



Little Paint Branch Exposed Pipe (After)



Inadequate Buffer
1990



Stream Corridor Assessments

Inadequate Buffer 1995



Stream Corridor Assessments

Inadequate Buffer

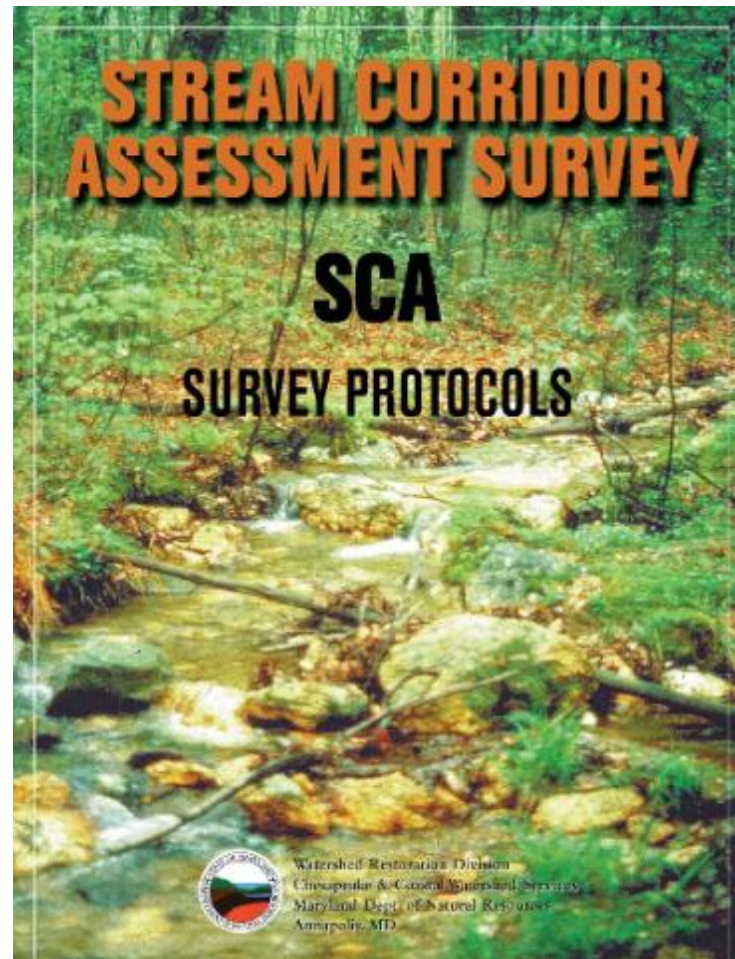
1999



Stream Corridor Assessments

Inadequate Buffer 2002





<http://www.dnr.state.md.us/irc/docs/00005291.pdf>