

Upper Monocacy Watershed Stream Corridor Assessment

Winter 2015

**Prepared By
Carroll County Bureau of Resource Management**



Upper Monocacy Watershed Stream Corridor Assessment

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Upper Monocacy Watershed Stream Corridor Assessment

I. Introduction

A Stream Corridor Assessment of the Upper Monocacy watershed was conducted during the winter of 2014-2015 by Carroll County Bureau of Resource Management staff. The goal of this assessment was to identify current impairments within the watershed, as well as identify locations to implement restoration practices.

The Upper Monocacy watershed is located in northwest Carroll County, bordered by Frederick County, Maryland and Adams County, Pennsylvania. The Upper Monocacy watershed drains into the Potomac River and ultimately to the Chesapeake Bay.

The Upper Monocacy watershed is managed on the 12-Digit scale and includes 8 subwatersheds. Table 1-1 lists the subwatersheds within the Upper Monocacy watershed as well as their associated drainage and stream lengths. Figure 1-1 shows the location of the study area within Carroll County.

Table 1-1: Subwatershed Breakdown

DNR 12-digit Scale	Subwatershed	Acres	Stream Miles
021403030264	Alloway Creek	3,952.90	21.29
021403030267	Piney Creek Upper A	2,371.26	10.80
021403030266	Piney Creek Upper B	95.13	0.67
021403030257	Piney Creek C	5,988.55	33.38
021403030255	Piney Creek D	5,293.55	27.43
021403030254	Piney Creek Lower	3,762.76	20.58
021403030256	Upper Monocacy River North	2,914.95	9.04
021403030247	Upper Monocacy River South	2,744.47	10.10
Upper Monocacy Watershed Total		27,123.57	133.29

II. Landowner Participation

This assessment reached out to 569 landowners within the Upper Monocacy watershed whose property is intersected by a stream corridor. Landowner permission was obtained through a mailing that detailed the assessment (a copy of this letter can be found in Appendix A). A response card was also included for the landowner to send back with their permission response. Only properties with owner permission were assessed. Access was granted for approximately 67 of the 133 stream miles within the Upper Monocacy watershed. Figure 1-2 shows where landowner permission was granted to perform the assessment.

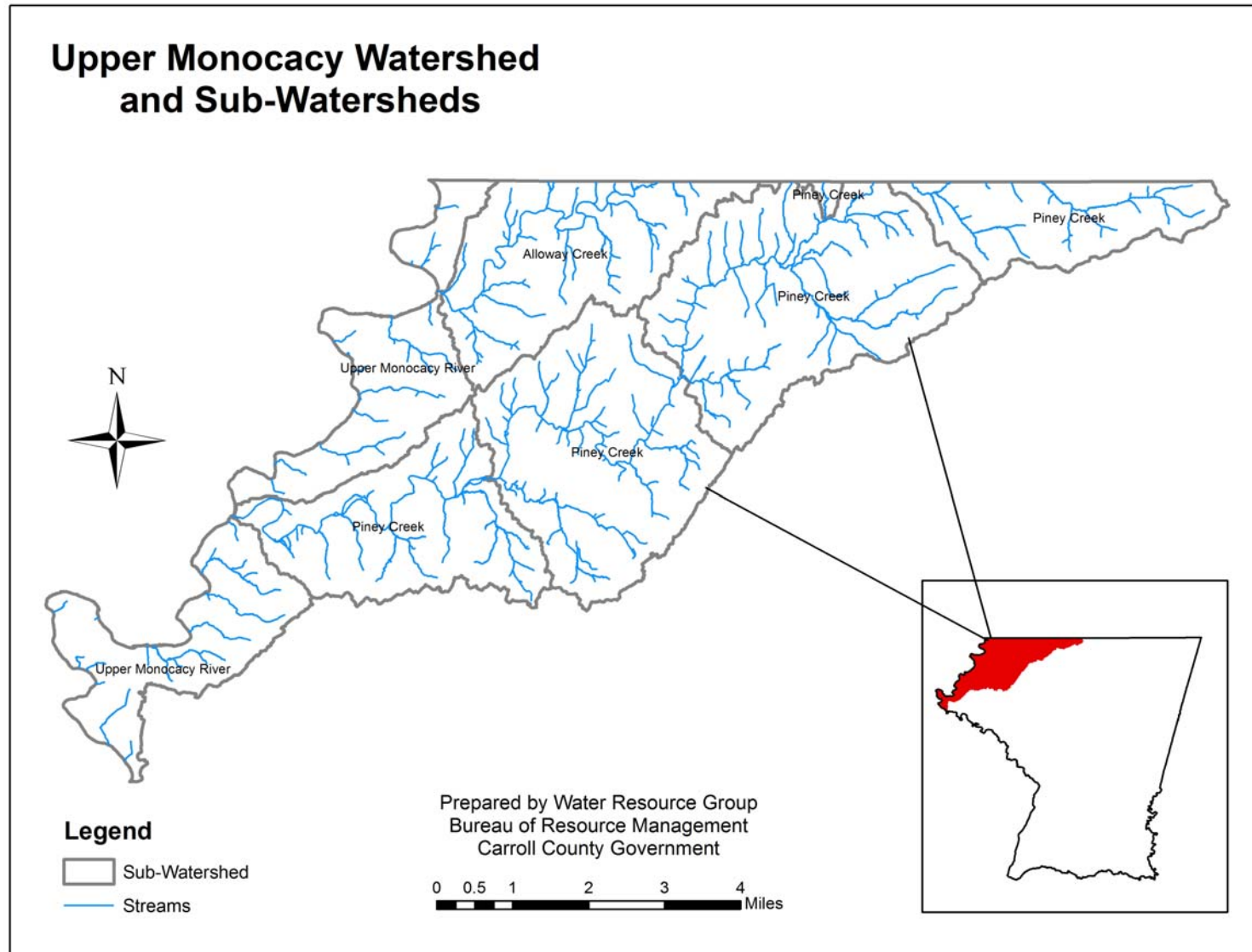


Figure 1-1: Location Map

Upper Monocacy Watershed Stream Corridor Assessment

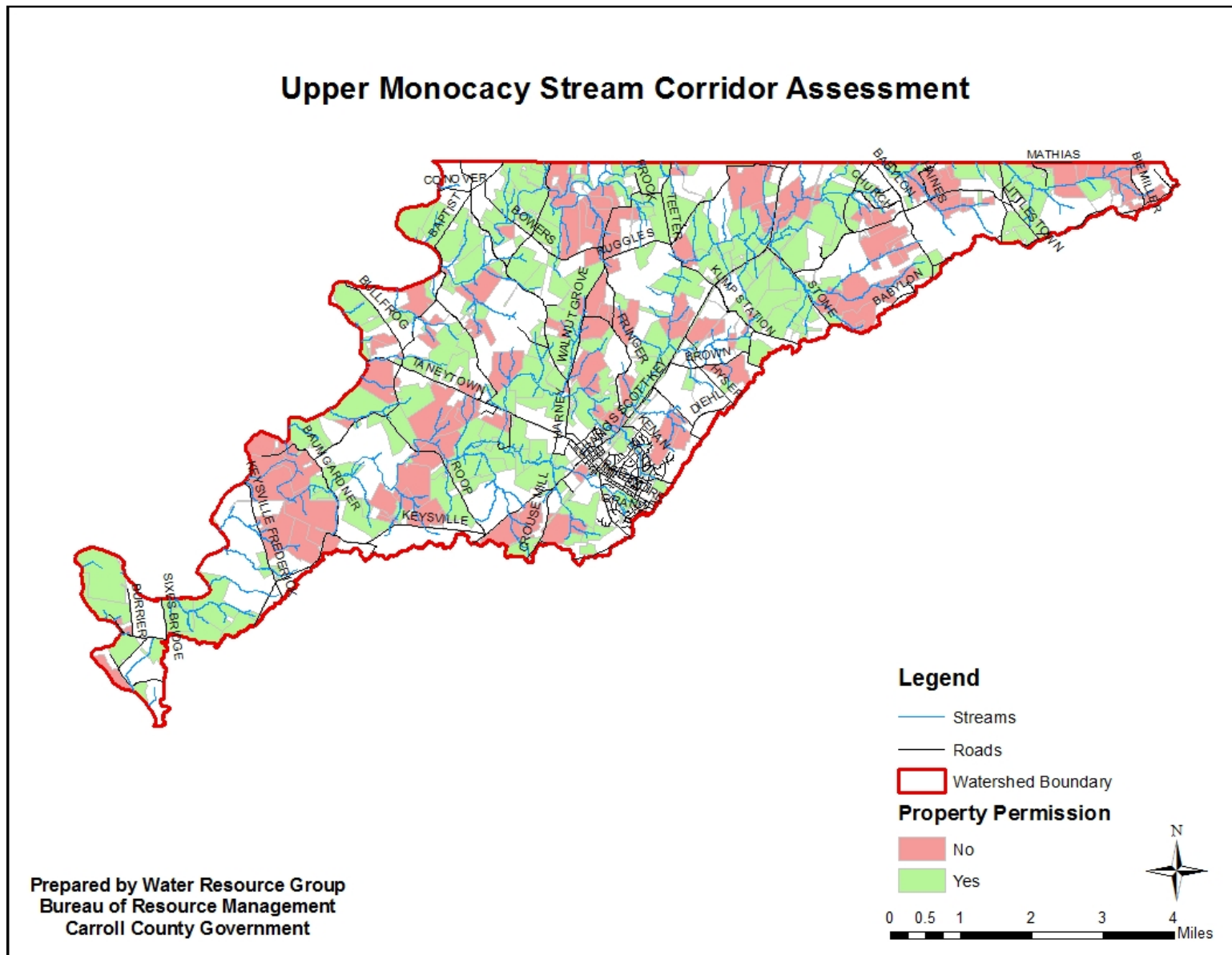


Figure 1-2: Landowner Participation

III. Methods

The field investigation consisted of two-person teams walking within the stream channel in order to visually assess potential environmental impacts to the stream corridor. Field teams carry Global Position System (GPS) enabled Toughbooks® that allow identified impacts to be recorded on site into an ArcGIS® database where it is assigned a unique ID number.

All stream corridors are assessed based on the survey protocols outlined by the Maryland Department of Natural Resources (DNR) watershed restoration division using standard stream corridor assessment protocols as outlined in the “Stream Corridor Assessment Survey: SCA Protocols” (MDNR, 2001). Field teams collect information relating to eroded stream banks, channel alterations, exposed utility pipes, drainage pipe outfalls, fish barriers (debris jams), inadequate streamside buffers, trash dumps, and construction activity that are either in or near the stream. Any unusual conditions are also noted. Each impairment is then ranked on a scale of 1 to 5 in relation to the impairment’s severity, accessibility, and correctability. These numeric rankings are used to prioritize areas for restoration.

IV. Results

A total of 271 data points were collected across the watershed. Inadequate buffers and stream bank erosion were the most frequently identified problems. Fish blockages were also regularly present throughout the watershed. Table 1-2 lists the data points by severity across the entire watershed. The most commonly identified impacts are shown in Figure 1-3, and Table 1-3 presents a summary of the number of impacts identified in each subwatershed. Criteria for ranking each impairments severity can be found in Appendix B.

Table 1-2: Data Points by Severity

Identified Impacts	Total	Very Severe	Severe	Moderate	Low	Minor
Erosion	59	3	3	17	8	28
Inadequate Buffer	84	16	17	30	11	10
Pipe Outfall	22	0	0	0	7	15
Fish Barrier	45	3	2	17	9	14
Trash Dump	26	2	0	7	8	9
Channel Alteration	8	0	0	3	2	3
Construction	0	0	0	0	0	0
Exposed Pipe	5	0	1	0	0	4
Unusual Condition	22	0	1	9	2	10
Total	271	24	24	83	47	93

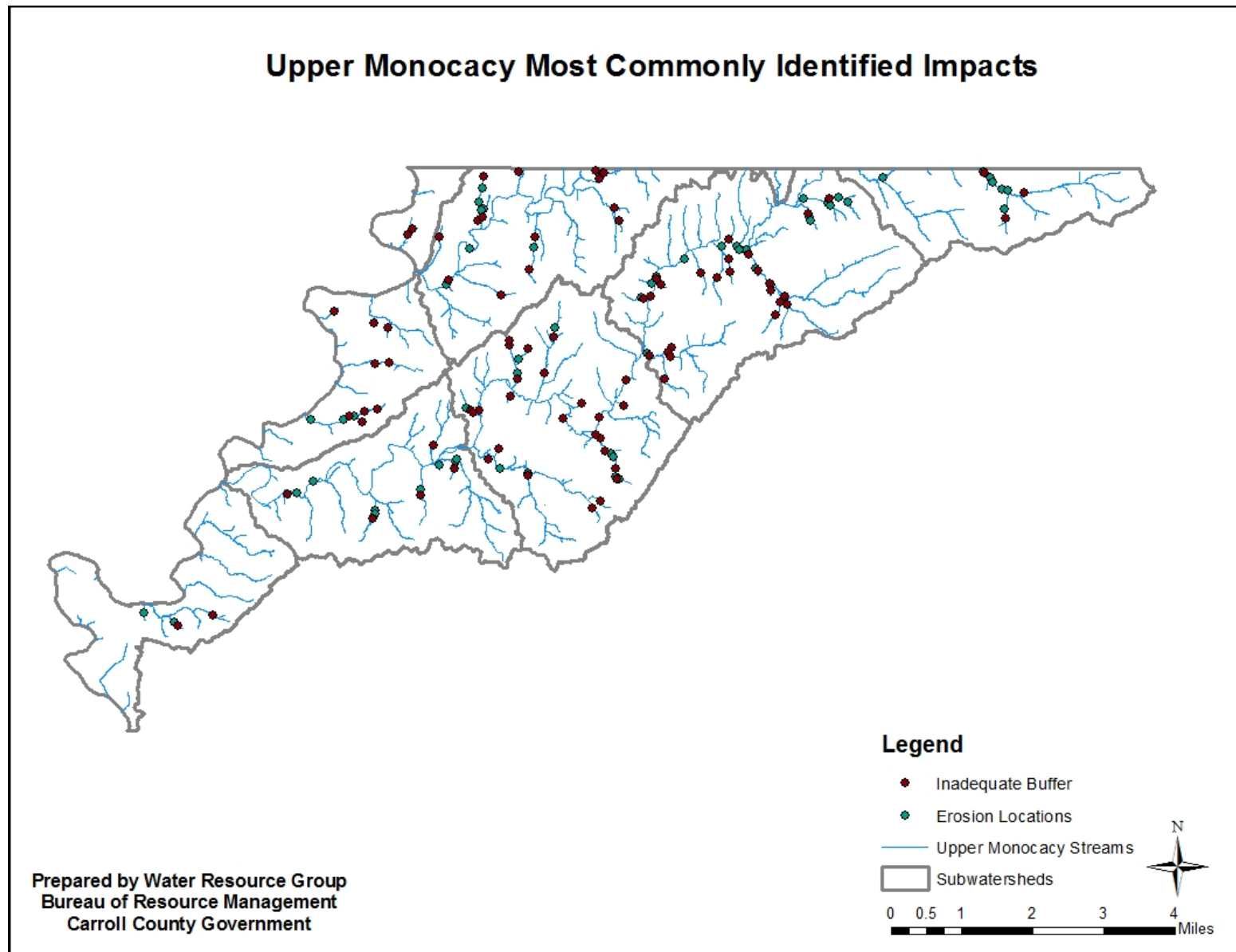


Figure 1-3: Most Commonly Identified Impacts

Table 1-3: Impacts Identified by Subwatershed

DNR 12-Digit	In-Stream Construction	Erosion	Unusual Condition	Fish Barrier	Inadequate Buffer	Trash Dump	Channel Alteration	Pipe Outfall	Exposed Pipe	Total
021403030264	0	8	5	4	14	7	2	4	1	45
021403030267	0	7	4	1	3	0	0	3	0	18
021403030266	0	0	0	0	0	0	0	0	0	0
021403030257	0	18	3	10	24	9	0	2	1	67
021403030255	0	13	7	16	25	6	6	11	3	87
021403030254	0	8	3	5	5	0	0	2	0	23
021403030256	0	3	0	3	11	1	0	0	0	18
021403030247	0	2	0	6	2	3	0	0	0	13
Total	0	59	22	45	84	26	8	22	5	271

A. Inadequate Buffer

The most common problem identified through the Stream Corridor Assessment was inadequate stream side buffers. Buffer areas were identified as inadequate along 44% of the streams assessed, with 7 percent of the entire watershed classified as severely un-buffered. 50 of the sites identified both sides of the stream as completely unshaded, and livestock was noted to be present at 5 different sites. Of the 84 sites identified, 2 had been recently planted but were not yet established. Figure 1-4 shows the location of identified inadequate buffers.

B. Erosion

The second most common problem identified through the Stream Corridor Assessment was erosion. A total of 4.8 miles, or 7 percent, of the 67 miles assessed were found to have an erosion problem, with approximately 1 percent of the watershed categorized as having a severe erosion problem. Figure 1-5 shows the location of active erosion sites identified during the Stream Corridor Assessment.

Table 1-4 presents the linear feet of inadequate buffer and stream erosion identified in each subwatershed.

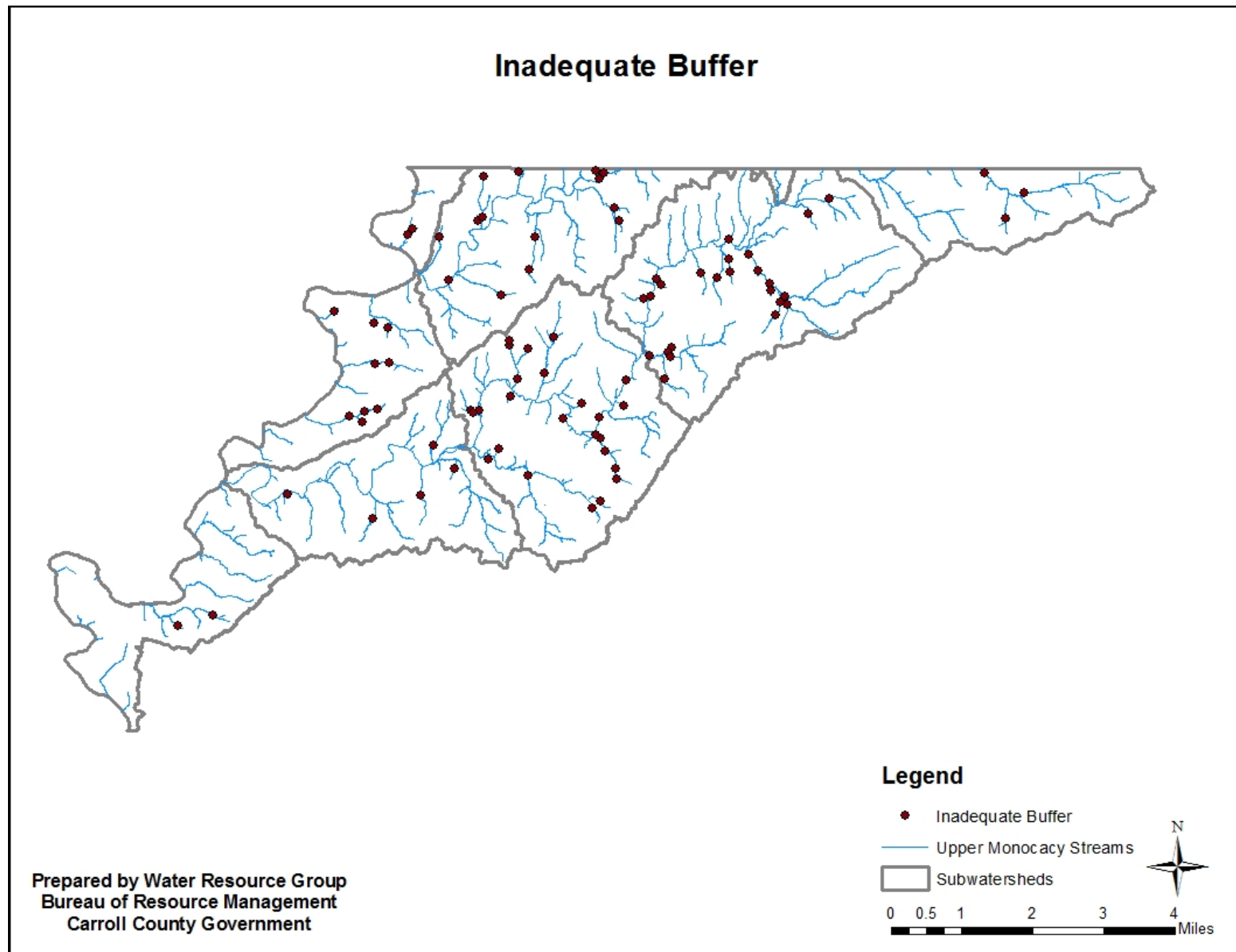


Figure 1-4: Inadequate Buffers

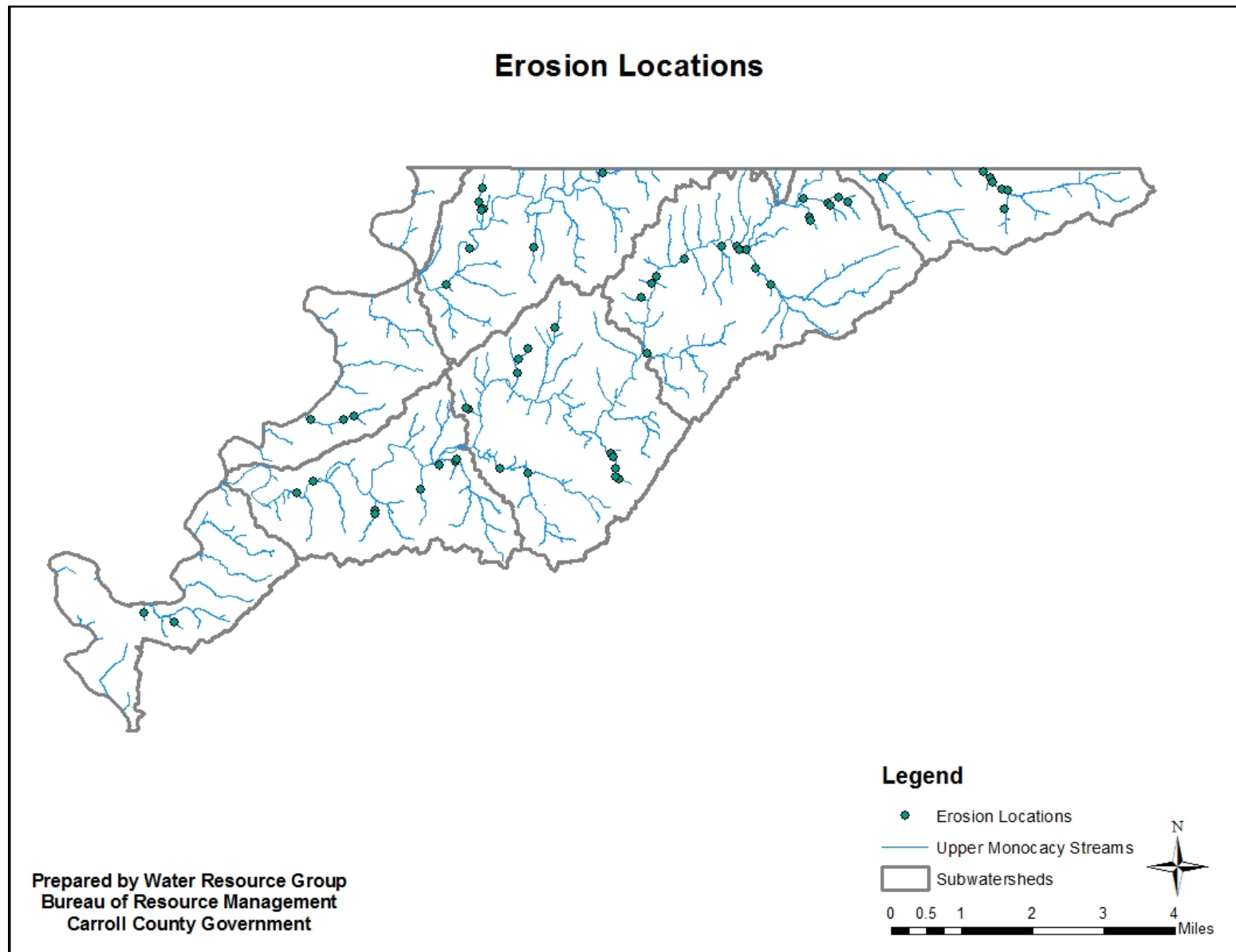


Figure 1-5: Erosion Locations

Table 1-4: Linear feet of Inadequate Buffer and Stream Erosion

Stream Segment (DNR 12-Digit)	Inadequate Buffer*	Erosion
021403030264	37,685	3,320
021403030267	6,800	800
021403030266	0	0
021403030257	33,335	4,470
021403030255	45,240	7,650
021403030254	9,575	6,185
021403030256	19,400	210
021403030247	4,200	2,900
Total	156,235 (29.59 miles)	25,535 (4.84 miles)

*Linear footage includes both right and left banks of stream

C. Pipe Outfalls

Outfalls were found throughout the entire watershed, with the highest concentration located in the Piney Creek D (0255) subwatershed. The majority of the outfalls identified were associated with agricultural use or stormwater conveyance and were given a low impact rating.

D. Exposed Pipes

Five exposed pipes were identified during the stream corridor assessment, 3 of which were located in the Piney Creek D (0255) subwatershed. Any exposed pipe identified is reported to the appropriate public works department for additional investigation.

E. Channel Alteration

Impacts from channel alterations were found at 8 different sites within the watershed and totaled 1,050 linear feet. The alterations identified were primarily associated with the protection of infrastructure and were given a minor severity ranking.

The location of identified pipe outfalls, exposed pipes, and channel alterations can be found in Figure 1-6.

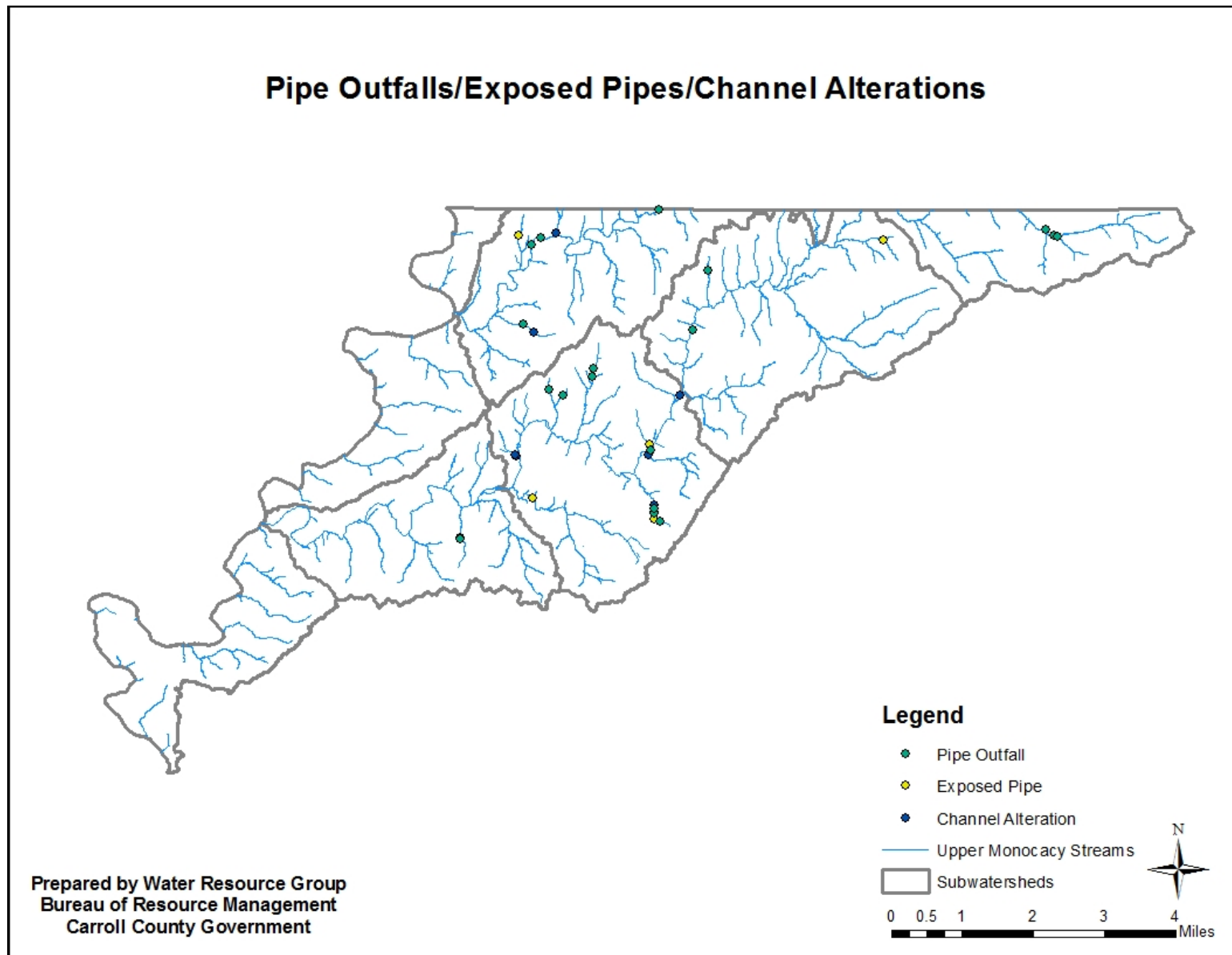


Figure 1-6: Pipe Outfalls, Exposed Pipes, and Channel Alterations

F. Fish Barriers

There were 45 fish barriers identified during the survey; all of the sites were associated with temporary debris dams (17), perched road culverts (15), or natural falls (13). Six of the identified sites significantly restricted upstream fish movement and received a moderate to severe rating. Figure 1-7 shows the location of identified fish barriers.

G. Trash Dumps

Impacts from trash were identified in 26 locations within the watershed; most of the sites had a moderate to minor severity rating. The largest site estimated to have approximately 6 truckloads of waste. The location of identified trash sites can be found in Figure 1-8.

H. In or Near Stream Construction

No in or near stream construction sites were identified during the assessment.

I. Unusual Conditions/Comments

Field crews identified 22 unusual conditions during the assessment. The majority of the unusual conditions were comment based, noting or describing something out of the ordinary. The location of these can be found in Figure 1-9.

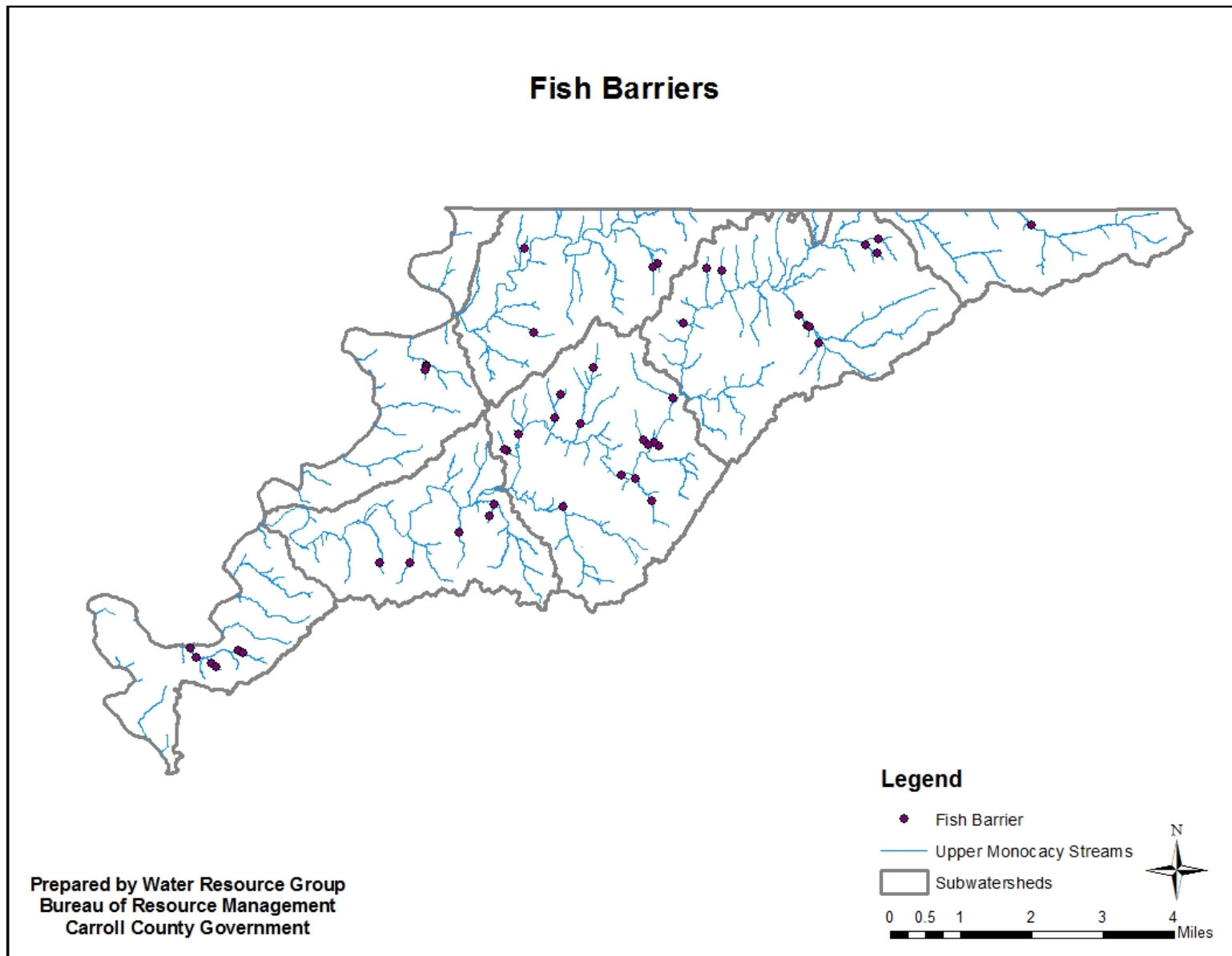


Figure 1-7: Fish Barriers

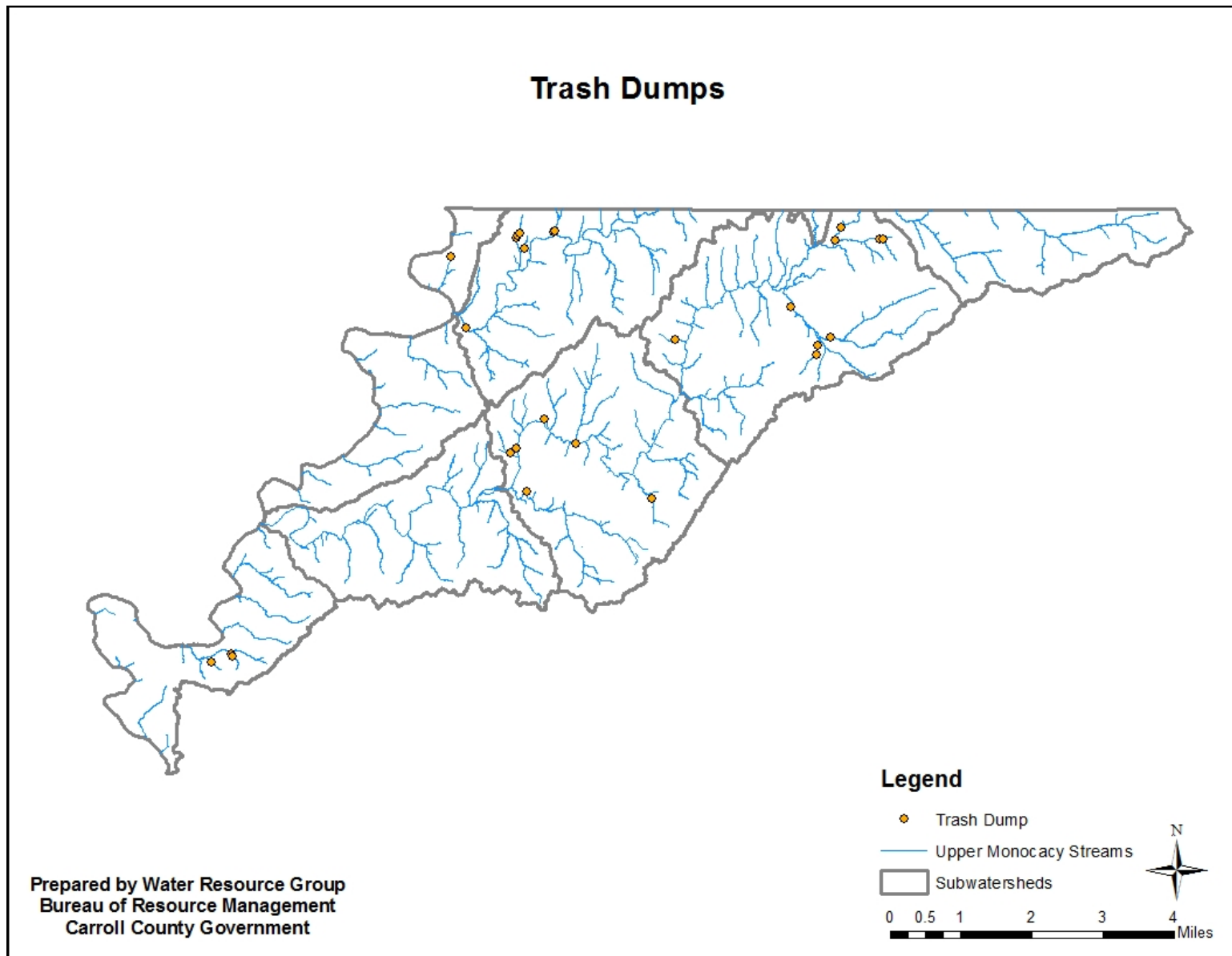


Figure 1-8: Trash Dumps

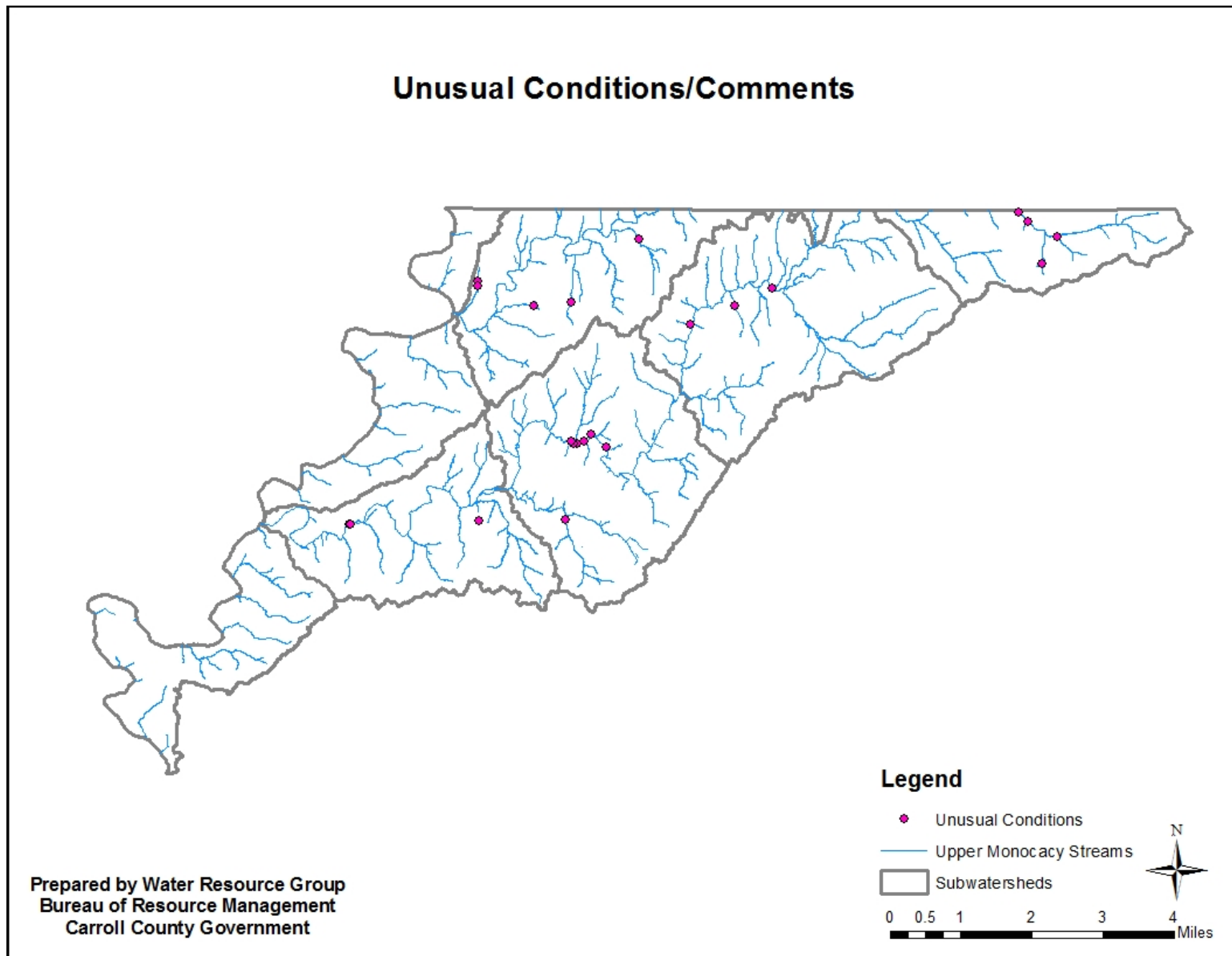


Figure 1-9: Unusual Conditions

J. Subwatershed Summary

Alloway Creek (0264): Erosion problems were identified along 3,320 linear feet of the stream channel (3% of subwatershed streams), with 400 feet classified as severely eroded (12% of marked erosion within the subwatershed). Inadequate buffers were identified along 37,685 linear feet of the streambank (33% of subwatershed streams), with 8,000 feet classified as severe (21% of marked inadequate buffer within the subwatershed).

Piney Creek Upper A (0267): Erosion problems were identified along 800 linear feet of the stream channel (1% of subwatershed streams), with none classified as severely eroded. Inadequate buffers were identified along 6,800 linear feet of the streambank (12% of subwatershed streams), with 3,000 feet classified as severe (44% of marked inadequate buffer within the subwatershed).

Piney Creek Upper B (0266): Erosion problems and inadequate buffers were not noted in this subwatershed.

Piney Creek C (0257): Erosion problems were identified along 4,470 linear feet of the stream channel (2.5% of subwatershed streams), with 1000 feet classified as severely eroded (22% of marked erosion within the subwatershed). Inadequate buffers were identified along 33,335 linear feet of the streambank (19% of subwatershed streams), with 19,160 feet classified as severe (57% of marked inadequate buffer within the subwatershed).

Piney Creek D (0255): Erosion problems were identified along 7,650 linear feet of the stream channel (5% of subwatershed streams), with none classified as severely eroded. Inadequate buffers were identified along 45,240 linear feet of the streambank (31% of subwatershed streams), with 19,550 feet classified as severe (43% of marked inadequate buffer within the subwatershed).

Piney Creek Lower (0254): Erosion problems were identified along 6,185 linear feet of the stream channel (6% of subwatershed streams), with 5,200 feet classified as severely eroded (84% of marked erosion within the subwatershed). Inadequate buffers were identified along 9,575 linear feet of the streambank (9% of subwatershed streams), with 8,025 feet classified as severe (84% of marked inadequate buffer within the subwatershed).

Upper Monocacy River North (0256): Erosion problems were identified along 210 linear feet of the stream channel (less than 1% of subwatershed streams), with none classified as severely eroded. Inadequate buffers were identified along 19,400 linear feet of the streambank (41% of subwatershed streams), with 11,000 feet classified as severe (57% of marked inadequate buffer within the subwatershed).

Upper Monocacy River South (0247): Erosion problems were identified along 2,900 linear feet of the stream channel (5% of subwatershed streams), with none classified as severely eroded. Inadequate buffers were identified along 4,200 linear feet of the streambank (8% of subwatershed streams), with none classified as severe.

V. Summary

The Bureau is currently developing two plans for the Upper Monocacy watershed. The first is a Characterization Plan that references the natural and human characteristics of the watershed and discusses any water quality data that has been collected within the watershed. The second is a Restoration Plan that will define the Bureau's goals for addressing environmental concerns within the watershed. The focus will be to address erosion problems through stormwater management and tree planting.

Appendix A: SCA Permission Letter

Upper Monocacy Watershed Stream Corridor Assessment

Gale J. Engles, Chief
Bureau of Resource Management
410-386-2145, 410-386-2210
Fax: 410-386-2924
Toll Free: 1-888-302-3978
MD RELAY Call 711 or 800-735-2258
(TTY)



Department of
Land Use, Planning & Development
Carroll County Government
225 North Center Street
Westminster, MD 21157

October 15, 2014

Dear Watershed Resident:

The Carroll County Bureau of Resource Management will be conducting a stream corridor assessment of the streams located in the Upper Monocacy watershed. The goal of this assessment is to identify locations that would benefit from potential water quality improvement efforts. The County is contacting all landowners within the watershed who own land adjacent to a stream corridor, and requesting permission from the landowner to survey the stream on their property during the winter of 2014/2015.

County staff will be performing the fieldwork for this survey. Teams of two to three field crew members will be walking the stream corridors in the watershed, making field observations of various characteristics such as erosion, undermined pipes, un-shaded stream corridors, trash dumps and other related environmental concerns that may impact water quality. Each team will pass through your property for a short time and will not be altering the landscape in any way. Each member of the team will be appropriately identified and observe proper protocols.

The information collected from this survey will be used to help direct future stream restoration and protection efforts. Please use the enclosed card to indicate your choice for permission and return the card to our office by December 15, 2014. For more information about this study, please contact me at (410) 386-2167. Thank you in advance for your participation.

Sincerely,

Byron Madigan

Byron R. Madigan
Water Resources Supervisor
Department of Land Use, Planning and Development
Carroll County Government
bmadigan@cgc.carr.org

Appendix B: Impairment Severity Criteria

BF-Inadequate Buffer

- a) Severe
 - i) Length of stream (>1000') w/ no trees on either side
- b) Moderate
 - i) Moderate length of stream with trees on only one side
- c) Minor
 - i) Stream section with trees on both sides, but with buffer <50'

2) ER-Erosion Site

- a) Severe Rating of 1
 - i) Long section >1000' w/ unstable banks on both sides
 - ii) Incised several feet and eroding very fast
 - iii) Stream bank is eroded below the root zone
- b) Moderate Rating of 3
 - i) Long section >1000' w/ moderate erosion problems
 - ii) **OR** shorter reach 300-400' w/ high banks >4'
- c) Minor Rating of 5
 - i) Short section of stream <300' w/ erosion at one or two meander bends

3) EX-Exposed Pipe (Sewer Line, etc.)

- a) Severe Rating of 1
 - i) Any pipe that is leaking or being undermined
 - ii) Or suspended above the stream bed
- b) Moderate Rating of 3
 - i) Long section of pipe that is partially exposed but no immediate threat the pipe will be undermined
- c) Minor Rating of 5
 - i) Small section of top of pipe exposed
 - ii) Stream bank appears stable

4) FB- Fish Barrier

- a) Severe Rating of 1
 - i) Dam or road culvert on large stream (3rd order or >) totally blocking upstream movement
- b) Moderate Rating of 3
 - i) Total fish blockage on a tributary significantly isolating a reach of stream
- c) Minor Rating of 5
 - i) Temporary barrier such as beaver dam

5) OF- Pipe Outfall (storm discharge, field drain, etc.)

- a) Severe Rating of 1
 - i) Outfall with strong discharge and distinct color/smell
 - ii) Discharge causing significant impact downstream
- b) Moderate Rating of 3
 - i) Outfall with small discharge
- c) Minor Rating of 5
 - i) Storm water pipes that have no dry weather discharge

6) CH- Channel Alteration

- a) Severe Rating of 1
 - i) Concrete channel w/ shallow water
 - ii) Significant section channelized >1000'
- b) Moderate Rating of 3
 - i) Channel >500' previously channelized
 - ii) Beginning to stabilize with vegetation
- c) Minor Rating of 5
 - i) Earthen channel <100'
 - ii) Size and shape of un-channelized reaches

7) TR- Trash Dump (within 50 feet of stream)

- a) Severe Rating of 1
 - i) Large amount scattered over large area, difficult access
 - ii) Chemical drums or hazmat regardless of amount
- b) Moderate Rating of 3
 - i) Large amount in small area with easy access
 - ii) Able to be cleaned up in a few days
- c) Minor Rating of 5
 - i) Small amount less than two pickups with easy access

8) UN- Unusual Condition

- a) Severe Rating of 1
 - i) Has direct and wide reaching impact on aquatic life
- b) Moderate Rating of 3
 - i) Has some adverse impacts at site
 - ii) Significant problem, but not the worst seen
- c) Minor Rating of 5
 - i) Problem does not appear to be affecting stream

9) CO- Stream Construction

- a) Severe Rating of 1
 - i) Large construction site w/ large amount of disturbance
 - ii) Absence of sediment control measures
- b) Moderate Rating of 3
 - i) Site near stream w/ little disturbance to banks
 - ii) Within riparian w/ some sediment entering stream
- c) Minor Rating of 5
 - i) Site away from stream and outside riparian
 - ii) Sediment control adequate no evidence sediment in stream