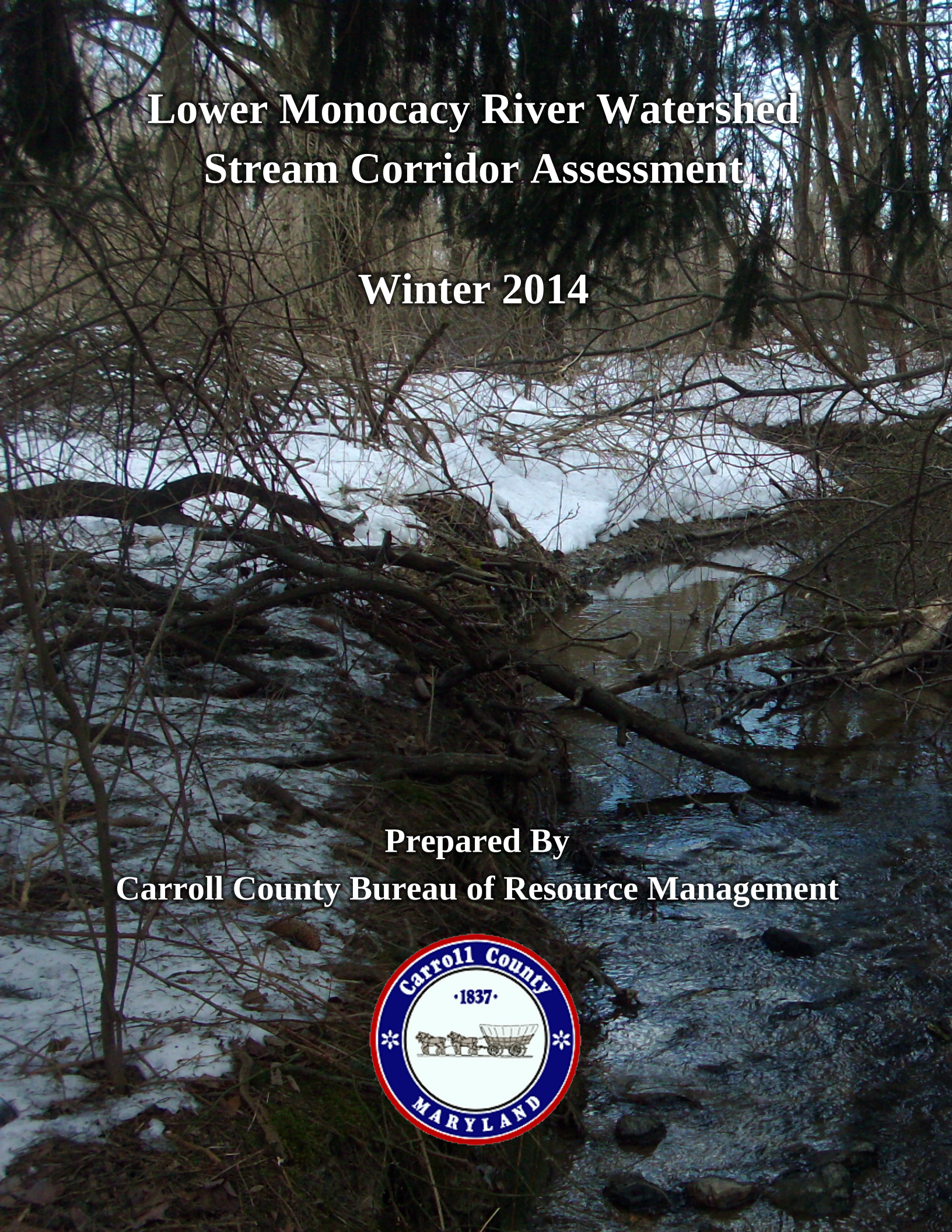

Lower Monocacy River Watershed Stream Corridor Assessment

Winter 2014

Prepared By

Carroll County Bureau of Resource Management

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I. Introduction

A stream corridor assessment of the Lower Monocacy River Watershed was conducted during the winter of 2014 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 Monocacy River originates in Pennsylvania and flows through Maryland ultimately emptying into the Potomac River. The watershed covers approximately 618,240 acres, with approximately 75% located in Maryland. The Lower Monocacy River Watershed is situated primarily in Frederick County, MD but includes a small portion of Carroll and Montgomery Counties, MD.

The Lower Monocacy River Watershed is managed on the 12-Digit scale and includes two subwatersheds within Carroll County, MD. Table 1-1 lists the subwatersheds within Lower Monocacy River Watershed as well as their associated drainage area and stream lengths. Figure 1-1 shows the location of the assessment area within Carroll County.

Table 1-1 Conewago Creek Subwatersheds

DNR 12-Digit	Subwatershed	Area (Acres)	Stream Miles
021403020238	North Fork	2,569.27	13.67
021403020235	South Fork	2,893.40	10.37
Totals:		**5,462.67**	**24.04**

II. Landowner Participation

This assessment reached out to 170 landowners within the Lower Monocacy River Watershed whose property is intersected by a stream corridor. Landowner permission was obtained through a mailing detailing 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 where owners granted permission were assessed. Access was granted for approximately 10 of the 23 stream miles, or 43%, within the Lower Monocacy River Watershed. Figure 1-2 shows where landowner permission was granted to perform the assessment.

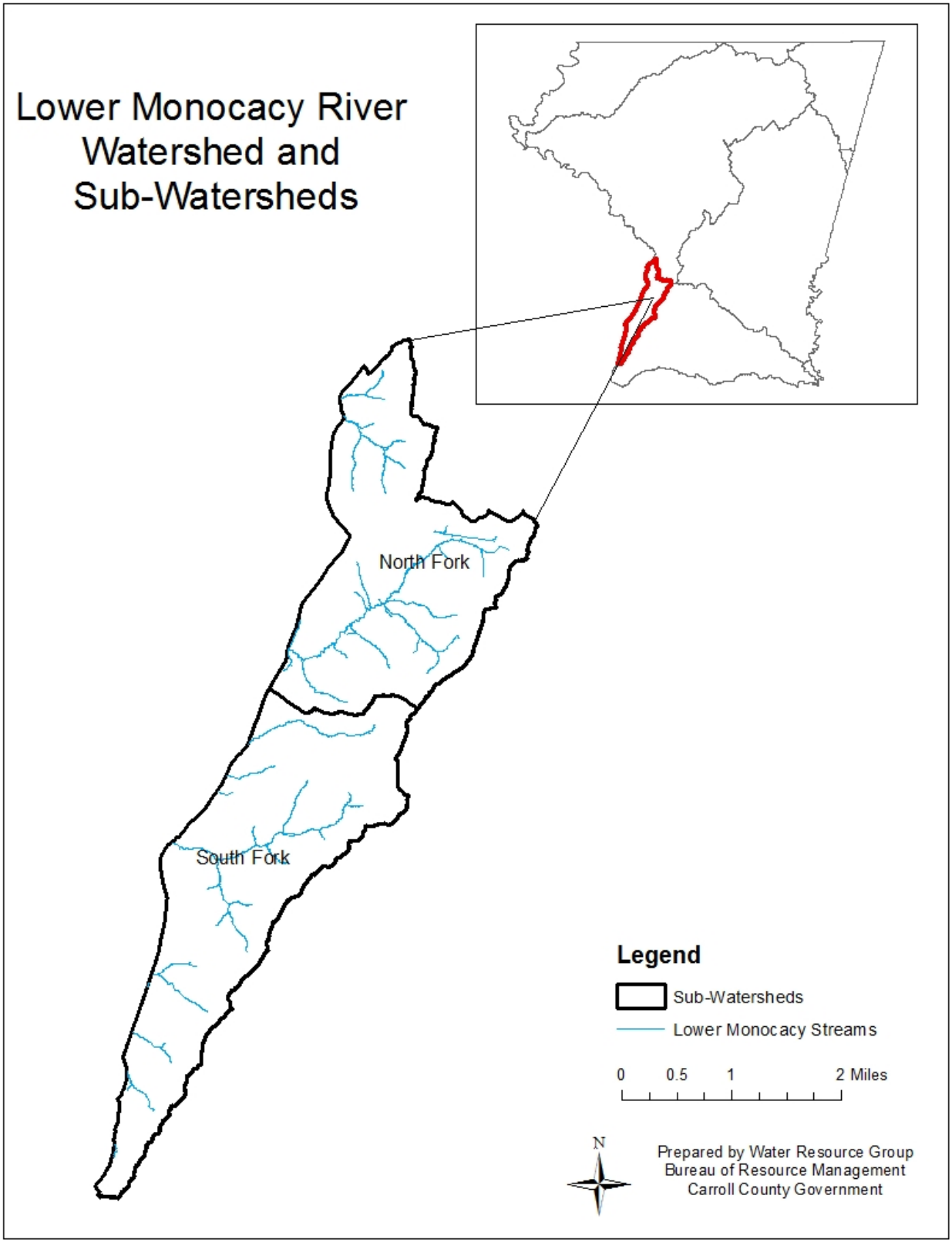

Figure 1-1: Lower Monocacy River Location Map

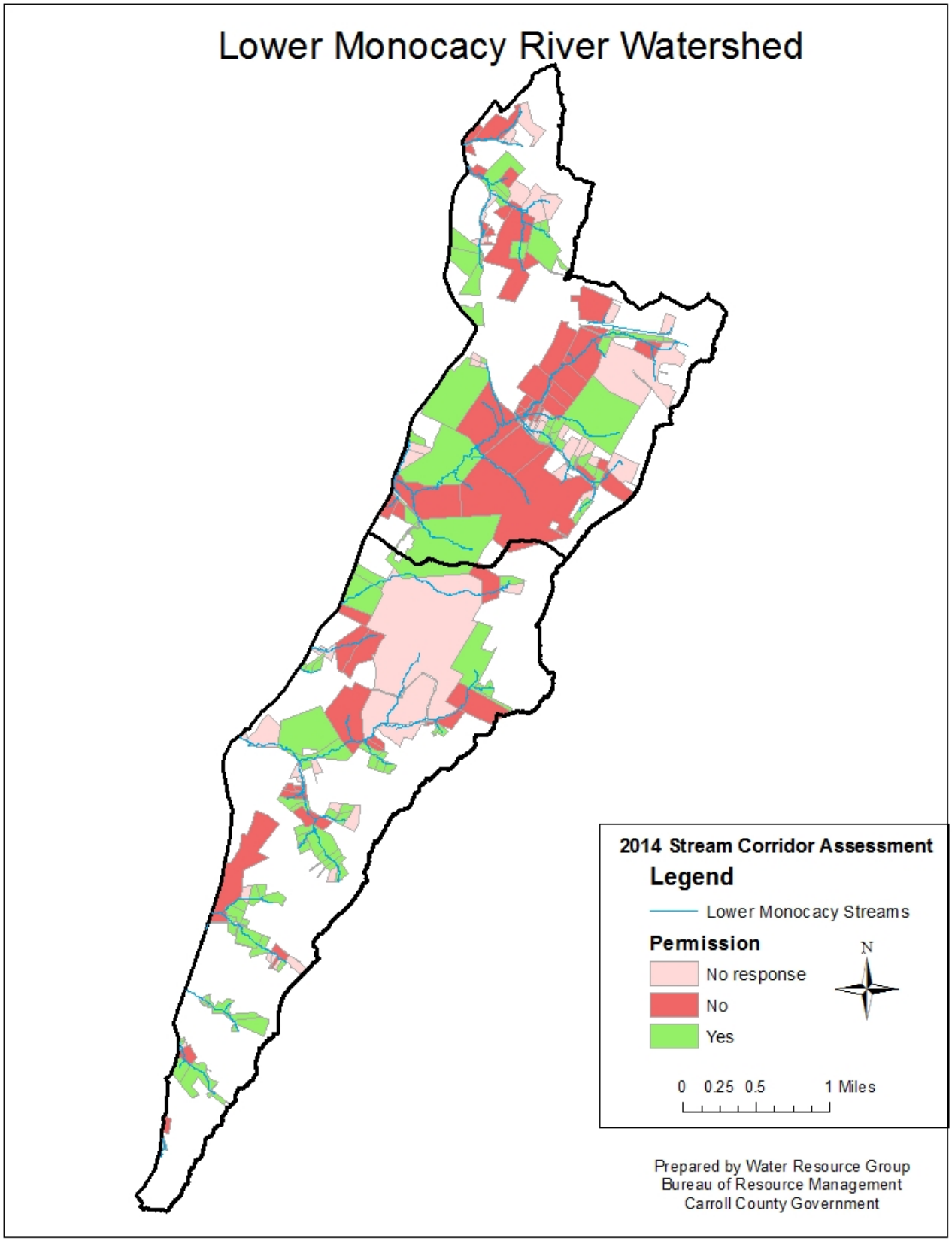

Figure 1-2: Landowner Participation

III. Methods

The field investigation consisted of two person teams physically walking within the stream channel in order to visually assess potential environmental impacts to the stream corridor. Field teams carry 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 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 alteration, exposed utility pipes, drainage pipe outfalls, fish barriers (debris jams), inadequate streamside buffers, trash dumps, construction activity; either in or near the stream, also any unusual conditions are noted. Each impairment is then ranked on a scale of 1 to 5 in relation to how severe the issue is, how accessible the location is, and how correctable the impairment is; would it be difficult or easy to remediate. These numeric rankings will then be used to prioritize areas for restoration.

IV. Results

A total of 57 data points were collected across the watershed. Stream bank erosion and fish barriers were the most frequently identified problems. Inadequate stream-side buffers 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. 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	**20**	2	1	6	3	8
Inadequate Buffer	**9**	1	2	4	1	1
Pipe Outfall	**2**				2	
Fish Barrier	**23**	4	1	13	3	2
Trash	**1**					1
Unusual Conditions	**2**			1		1
Total	**57**	**7**	**4**	**24**	**9**	**13**

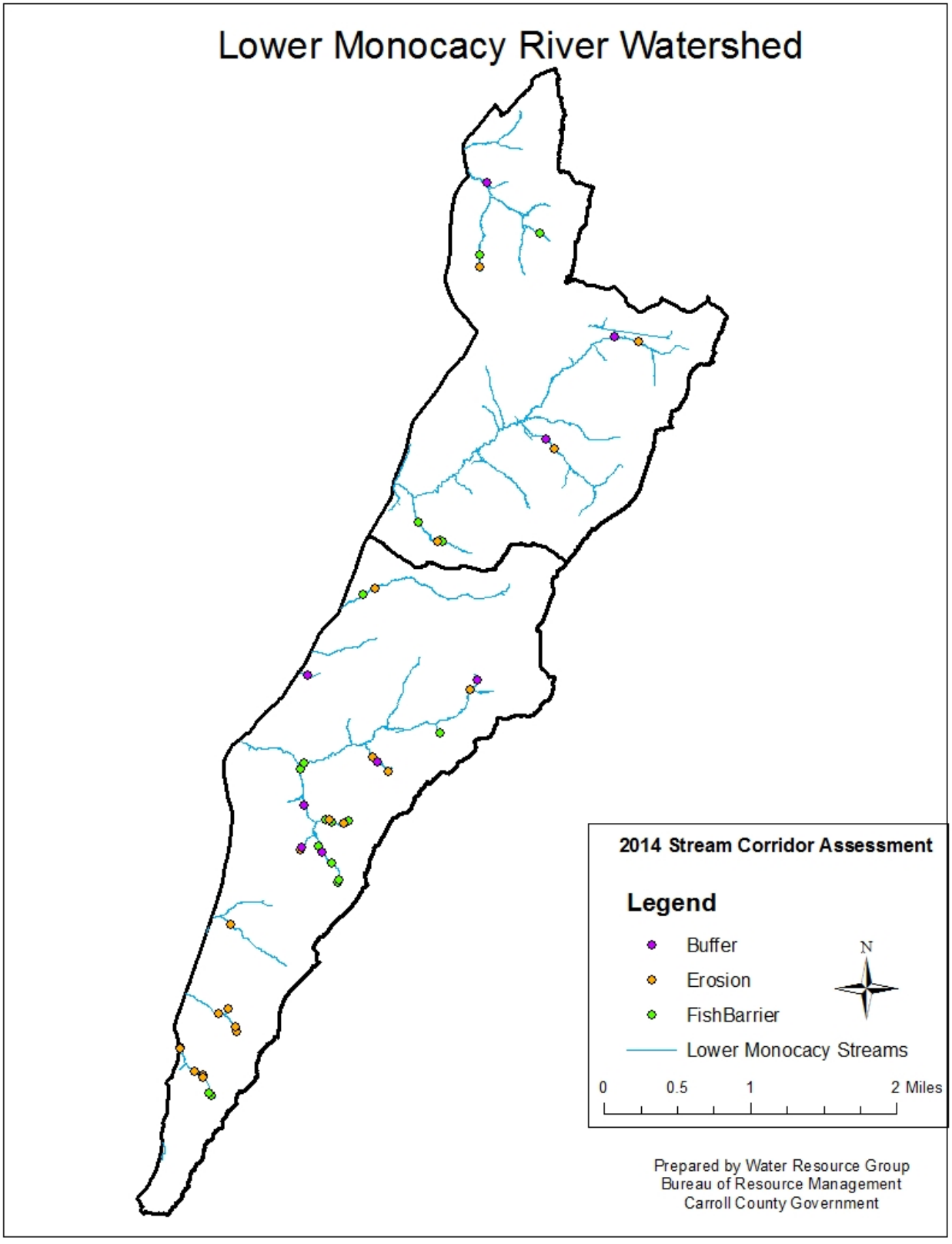

Figure 1-3: Most Commonly Identified Impact

A. Fish Barrier

The most common problem identified through the stream corridor assessment was presence of fish barriers. A total of 23 locations were noted as having a fish barrier. 83% of the fish barriers were noted as total blockages with too high of a drop, averaging approximately 26 inches. The most common causes of fish barriers were debris dams, followed by natural falls and crossings.

B. Erosion

Approximately 0.71 mile of streams was noted to have an erosion problem, primarily low to moderate impacted downcuts and headcuts.

C. Inadequate Buffer

Buffer areas were identified as inadequate for 0.86 mile of streams assessed. Most of the sites identified the stream as unshaded and on lawns. Horses were noted on 2 of the sites. Of the 9 sites identified, none had been recently planted.

D. Pipe Outfalls

Pipe outfalls were noted in 2 locations within the watershed. The purpose of both outfalls was unknown. Both had clear continuous discharge; one was rated as a severe impact.

E. Channel Alteration

No channel alterations were identified during the assessment.

F. Trash Dumps

One location was noted with minor trash impacts on private property, consisting of approximately 2 truckloads worth of waste.

G. In or Near Stream Construction

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

H. Exposed Pipes

No exposed pipes were identified during the assessment.

I. Unusual Conditions/Comments

Unusual conditions were identified at 2 locations during the assessment. One condition was a naturally caused, moderate impact leaf litter dam. The other unusual condition was suds in the stream, which was minor impact and potentially related to a nearby pond.

V. Summary

The Bureau is currently developing two plans for the Lower Monocacy River Watershed. The first is a Characterization Plan that references the natural and human characteristics of the watershed and will discuss any water quality data that may have 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 reforestation.

Appendix A:
SCA Permission Letter

Gale J. Engles, Bureau Chief
Bureau of Resource Management
410-386-2321, Fax: 410-386-2924
Environmental Inspection Services
410-386-2210

Department of Land Use, Planning and Development
Carroll County Government
225 North Center Street
Westminster, MD 21157
1-888-302-8978; TT 410-848-9747

October 22, 2013

Dear Watershed Resident:

The Carroll County Bureau of Resource Management will be conducting a stream corridor assessment of the streams located in the Lower 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 2013/2014.

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 22, 2013. 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@ccg.carr.org

Appendix B: Impairment Severity Criteria

1) **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 haz mat 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