

**South Branch Patapsco  
Stream Corridor Assessment**

**Winter 2013**

**Prepared By**

**Carroll County Bureau of Resource Management**



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## I. Introduction

A Stream Corridor Assessment of the South Branch Patapsco watershed was conducted during the winter of 2013 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 South Branch Patapsco watershed is located in southern Carroll County, bordered by Frederick County, Maryland and Howard County, Maryland. South Branch Patapsco watershed drains into the North Branch Patapsco river and ultimately the Chesapeake Bay.

The South Branch Patapsco watershed is managed on the 12-Digit scale and includes 11 subwatersheds. Table 1-1 lists the subwatersheds within South Branch Patapsco 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
1030	Gillis Falls	4,243	20.39
1031	Gillis Falls	3,118	14.37
1029	Middle Run	3,782	18.36
1021	Piney Run	2,307	11.46
1023	Piney Run	8,007	39.85
1024	Piney Run	1,443	7.15
1028	South Branch	3,169	18.09
1020	South Branch	1,431	10.15
1022	South Branch	1,953	11.89
1025	South Branch	4,116	24.49
1026	Tuckers Branch	5,166	25.02
<b>South Branch Watershed Total</b>		<b>38,735</b>	<b>201.22</b>

## II. Landowner Participation

This assessment reached out to 1,359 landowners within the South Branch Patapsco 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 156 of the 201 stream miles within the South Branch Patapsco watershed. Figure 1-2 shows where landowner permission was granted to perform the assessment.

South Branch Patapsco Watershed Stream Corridor Assessment

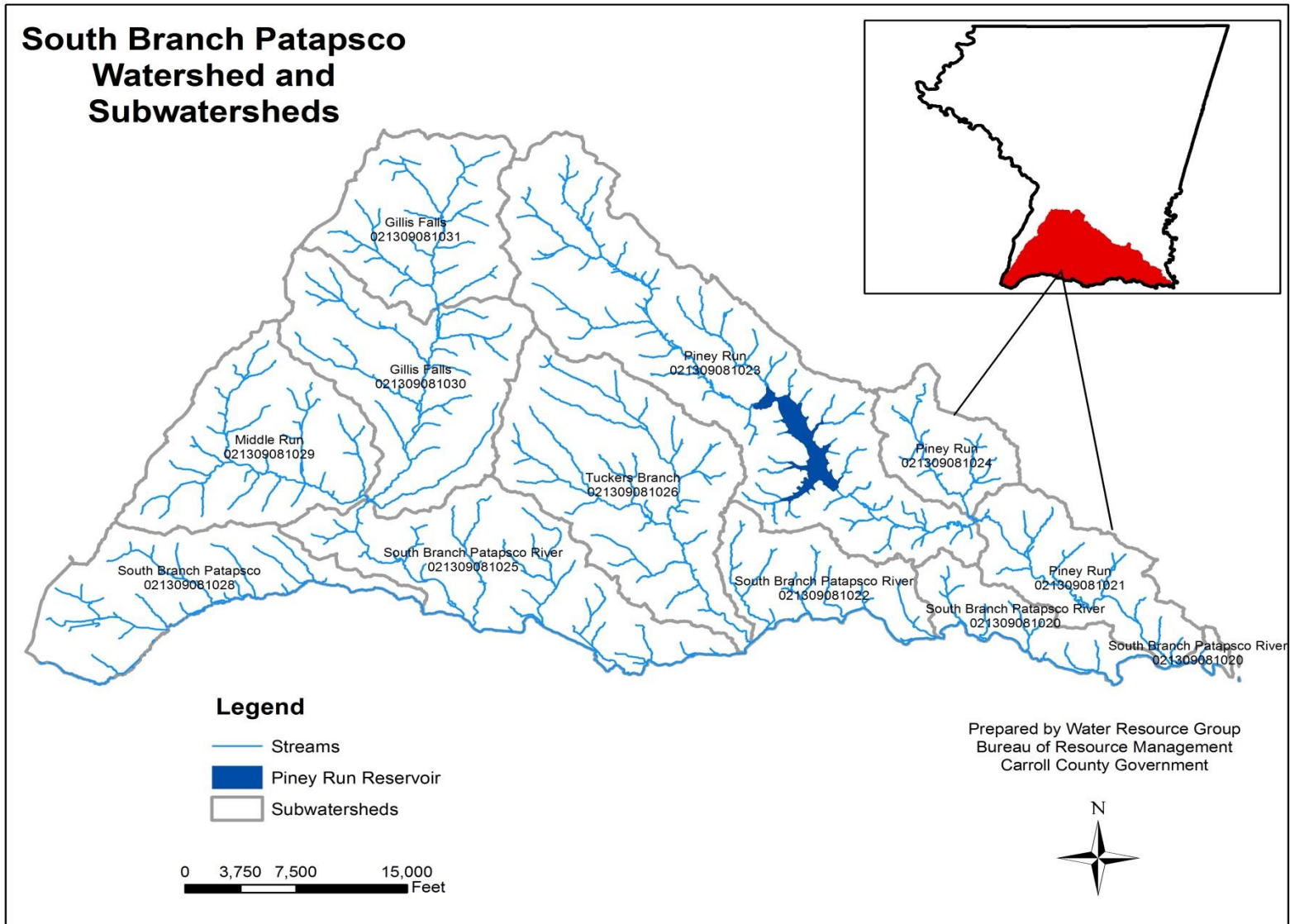


Figure 1-1: Location Map

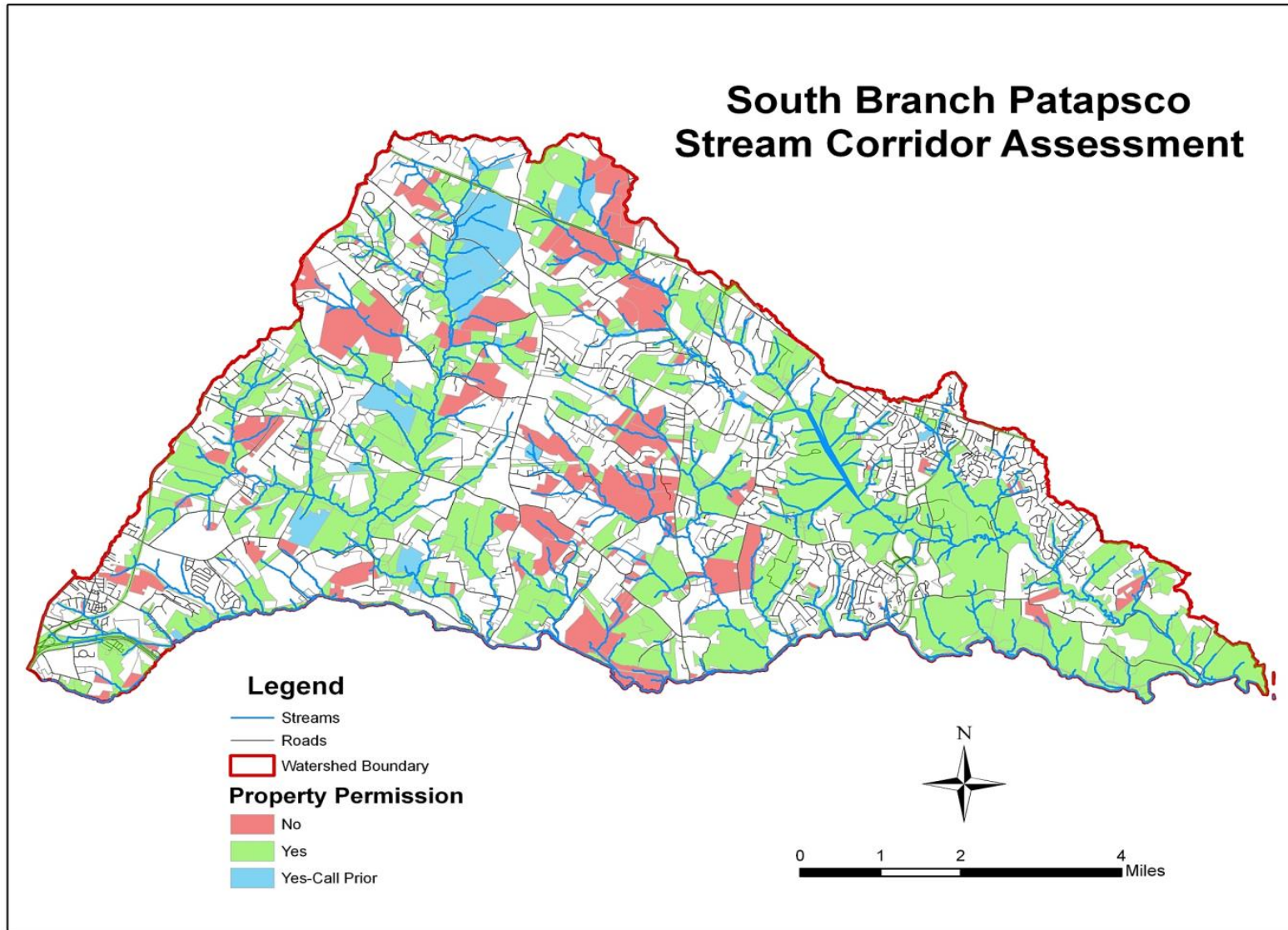


Figure 1-2: Landowner Participation

### 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 312 data points were collected across the watershed. Inadequate buffers and stream bank erosion were the most frequently identified problems. Drainage pipe outfalls and 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	128	10	11	40	12	55
Inadequate Buffer	114	13	12	42	32	15
Pipe Outfall	14	1	0	3	5	5
Fish Barrier	23	2	1	3	3	14
Trash Dump	7	0	0	3	1	3
Channel Alteration	2	0	0	1	1	0
Construction	0	0	0	0	0	0
Exposed Pipe	2	0	0	1	1	0
Unusual Condition	22	5	0	13	2	2
<b>Total</b>	<b>312</b>	<b>31</b>	<b>24</b>	<b>106</b>	<b>57</b>	<b>94</b>

South Branch Patapsco Watershed Stream Corridor Assessment

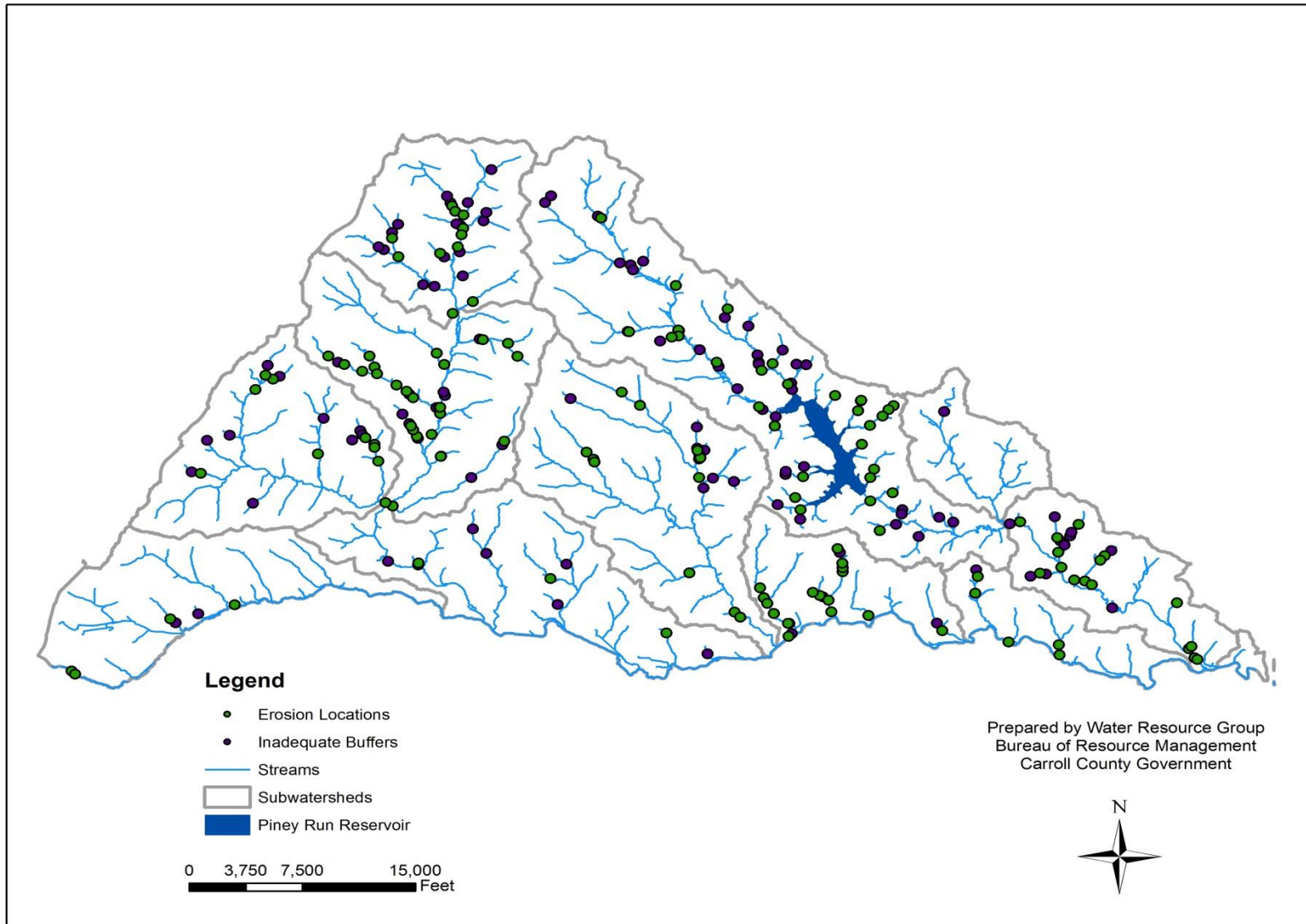


Figure 1-3: Most Commonly Identified Impacts

**Table 1-3: Stream Corridor Assessment – Identified Impacts**

<b>DNR 12-Digit</b>	<b>In-Stream Construction</b>	<b>Erosion</b>	<b>Fish Barrier</b>	<b>Inadequate Buffer</b>	<b>Trash Dump</b>	<b>Channel Alteration</b>	<b>Pipe Outfall</b>	<b>Exposed Pipe</b>	<b>Total</b>
1030	0	23	3	13	0	0	1	0	<b>40</b>
1031	0	11	1	18	0	0	0	0	<b>30</b>
1029	0	10	5	11	0	0	0	0	<b>26</b>
1021	0	16	3	10	2	0	5	0	<b>36</b>
1023	0	29	5	37	2	2	2	0	<b>77</b>
1024	0	0	0	1	1	0	1	0	<b>3</b>
1028	0	4	0	2	0	0	2	0	<b>8</b>
1020	0	5	2	1	0	0	0	1	<b>9</b>
1022	0	16	2	5	2	0	3	1	<b>29</b>
1025	0	3	2	7	0	0	0	0	<b>12</b>
1026	0	11	0	9	0	0	0	0	<b>20</b>
<b>Total</b>	<b>0</b>	<b>128</b>	<b>23</b>	<b>114</b>	<b>7</b>	<b>2</b>	<b>14</b>	<b>2</b>	<b>290</b>

**A. Erosion**

The most common problem identified through the Stream Corridor Assessment was erosion. A total of 10.32 miles (7%) of the 156 miles assessed were found to have an erosion problem, with approximately 3 percent of the watershed categorized as having a severe erosion problem. Figure 1-4 shows the location of active erosion sites identified during the Stream Corridor Assessment.

**B. Inadequate Buffer**

Buffer areas were identified as inadequate along 8% of the streams assessed, with 3 percent of the entire watershed classified as severely un-buffered. 43 of the sites identified both sides of the stream as completely unshaded, and livestock was noted to be present at 14 different sites. Of the 114 sites identified, 8 had been recently planted but were not yet established. Figure 1-5 shows the location of identified inadequate buffers.

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



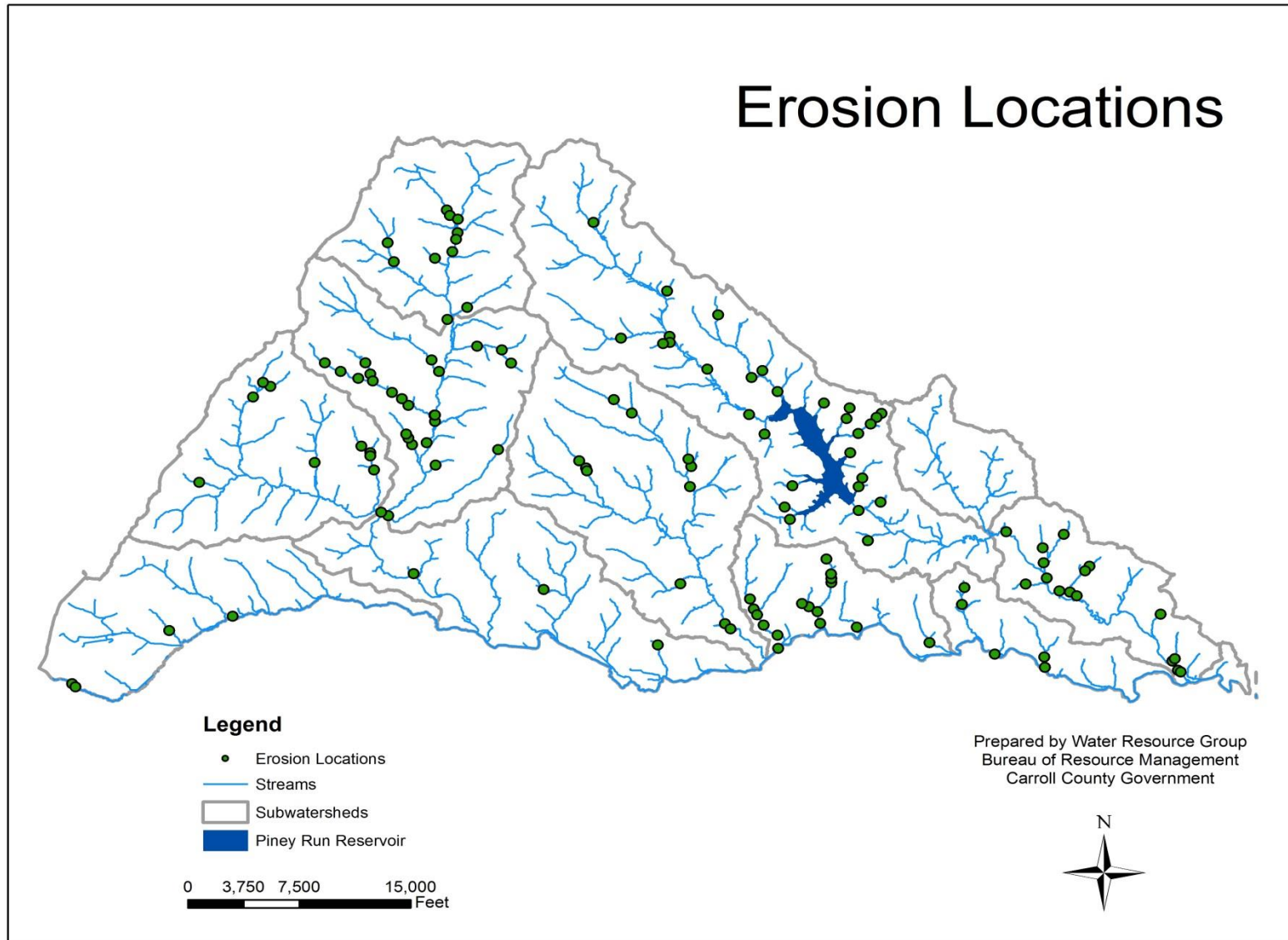
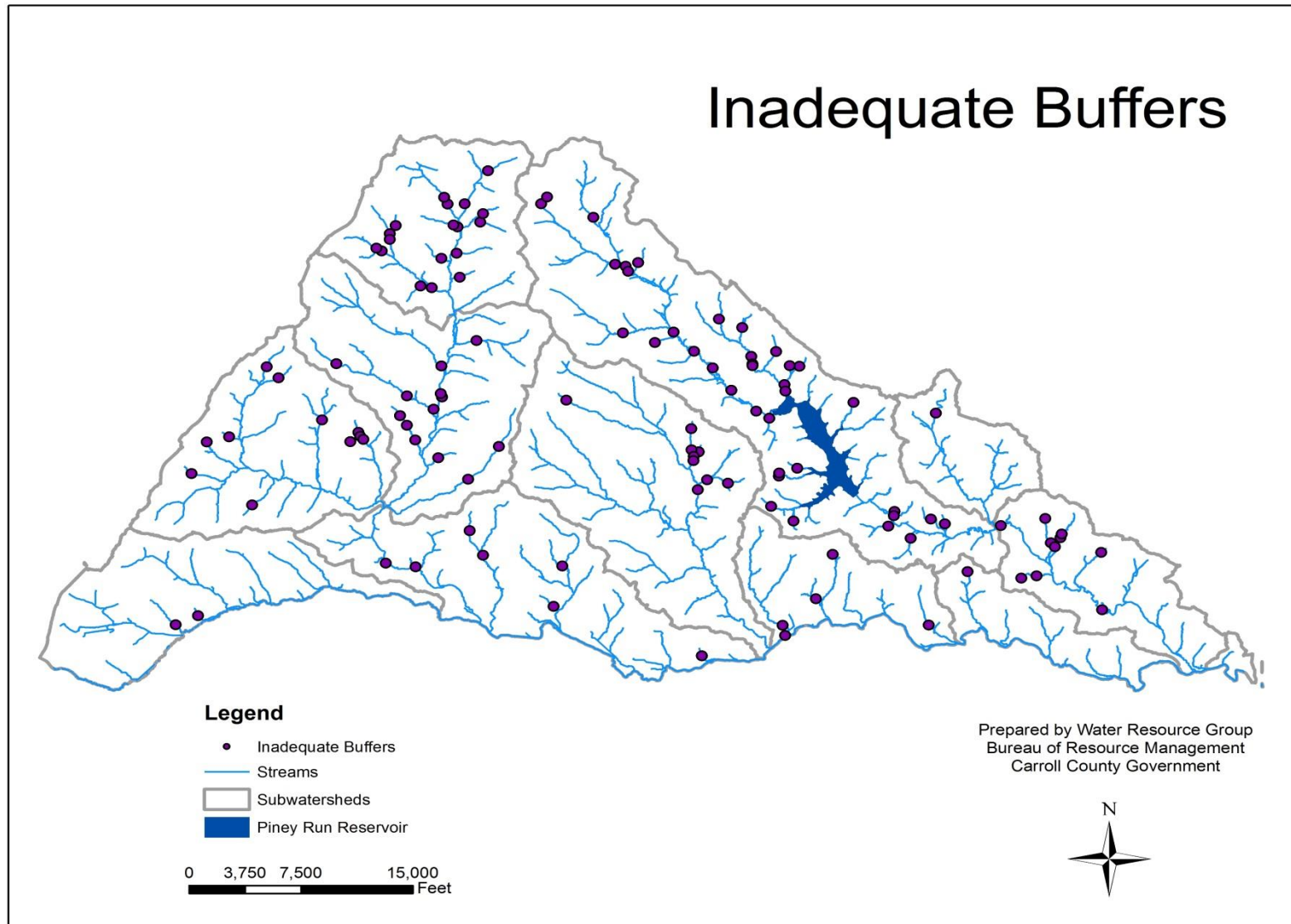


Figure 1-4: Erosion Locations



**Figure 1-5: Inadequate Buffers**

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

Stream Segment (DNR 12-Digit)	Erosion	Inadequate Buffer*
1030	6,060	16,755
1031	4,100	20,425
1029	3,370	7,620
1021	5,170	6,100
1023	18,760	43,130
1024	0	300
1028	1,925	4,900
1020	1,190	1,120
1022	5,490	4,300
1025	2,400	8,175
1026	6,035	15,150
<b>Total</b>	<b>54,500</b>	<b>127,975</b>

\*Linear footage includes both right and left banks of stream

### **C. Pipe Outfalls**

Outfalls were found throughout the entire watershed, but the highest concentrations were located in the Piney Run subwatershed. This higher concentration can be attributed to a higher residential density. The majority of the outfalls identified were associated with stormwater conveyance and were given a low impact rating.

### **D. Exposed Pipes**

Exposed pipes were identified at 2 different locations within the watershed. Any exposed pipe identified during the SCA is reported to the appropriate public works department for additional investigation.

### **E. Channel Alteration**

Impacts from channel alterations were found at 2 different sites within the watershed and totaled 520 linear feet. The alterations identified were 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.

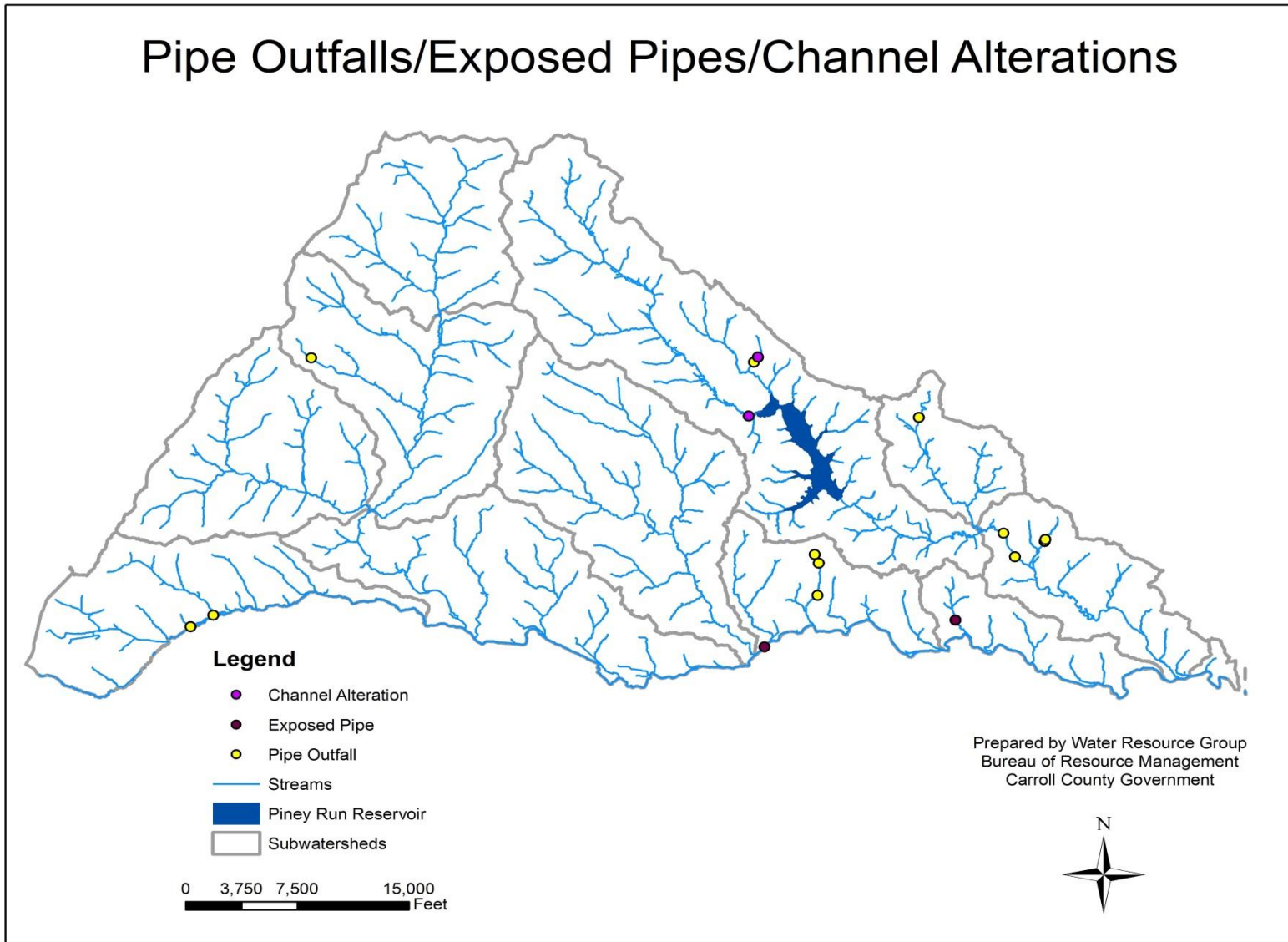


Figure 1-6: Pipe Outfalls, Exposed Pipes, and Channel Alterations

## **F. Fish Barriers**

There were 25 fish barriers identified during the survey; all of the sites were associated with temporary debris dams, perched road culverts, or natural falls. 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 minimal with 7 identified locations within the watershed; all of the sites had a moderate to minor severity rating, with the largest site estimated to have approximately 5 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.

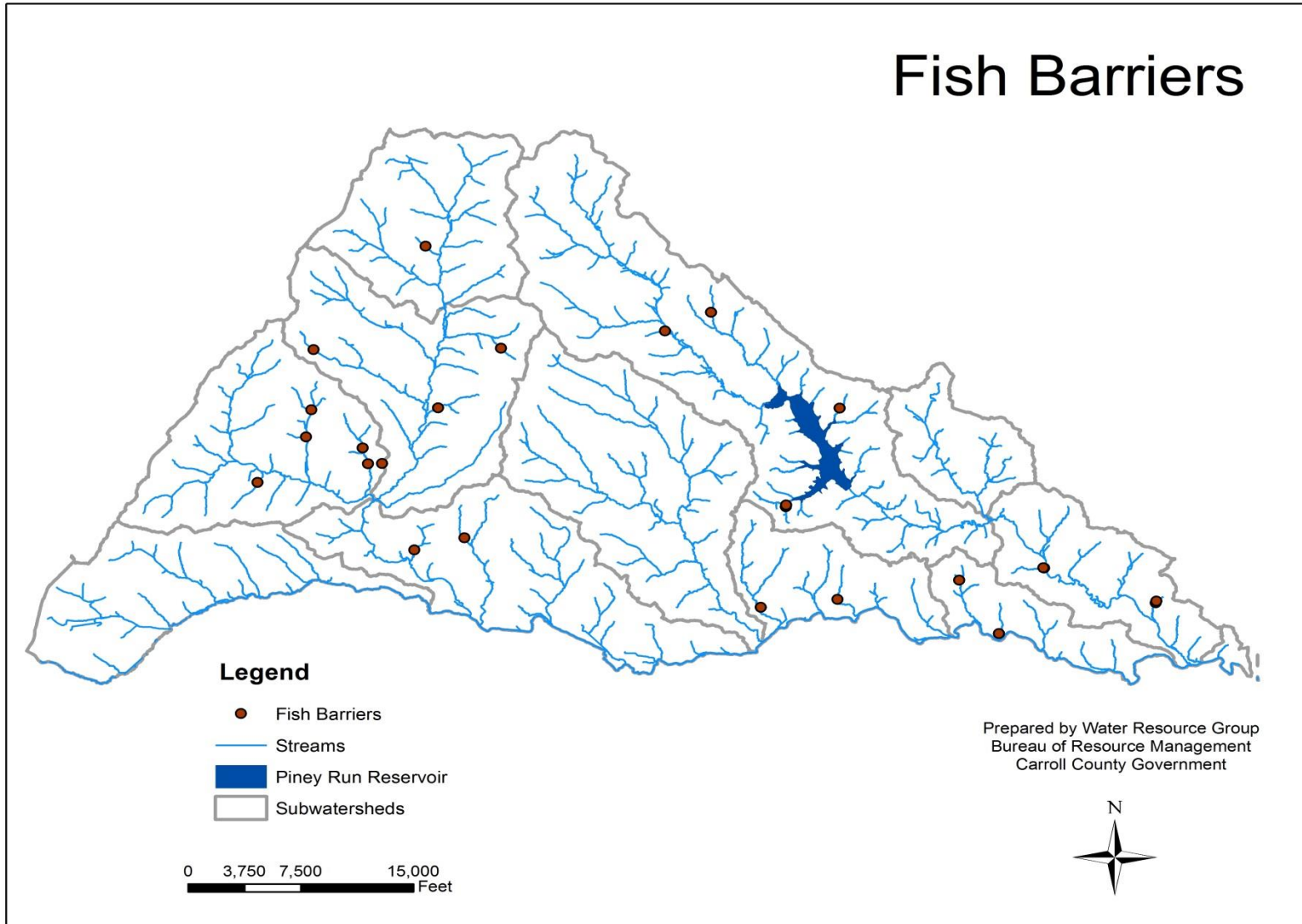


Figure 1-7: Fish Barriers

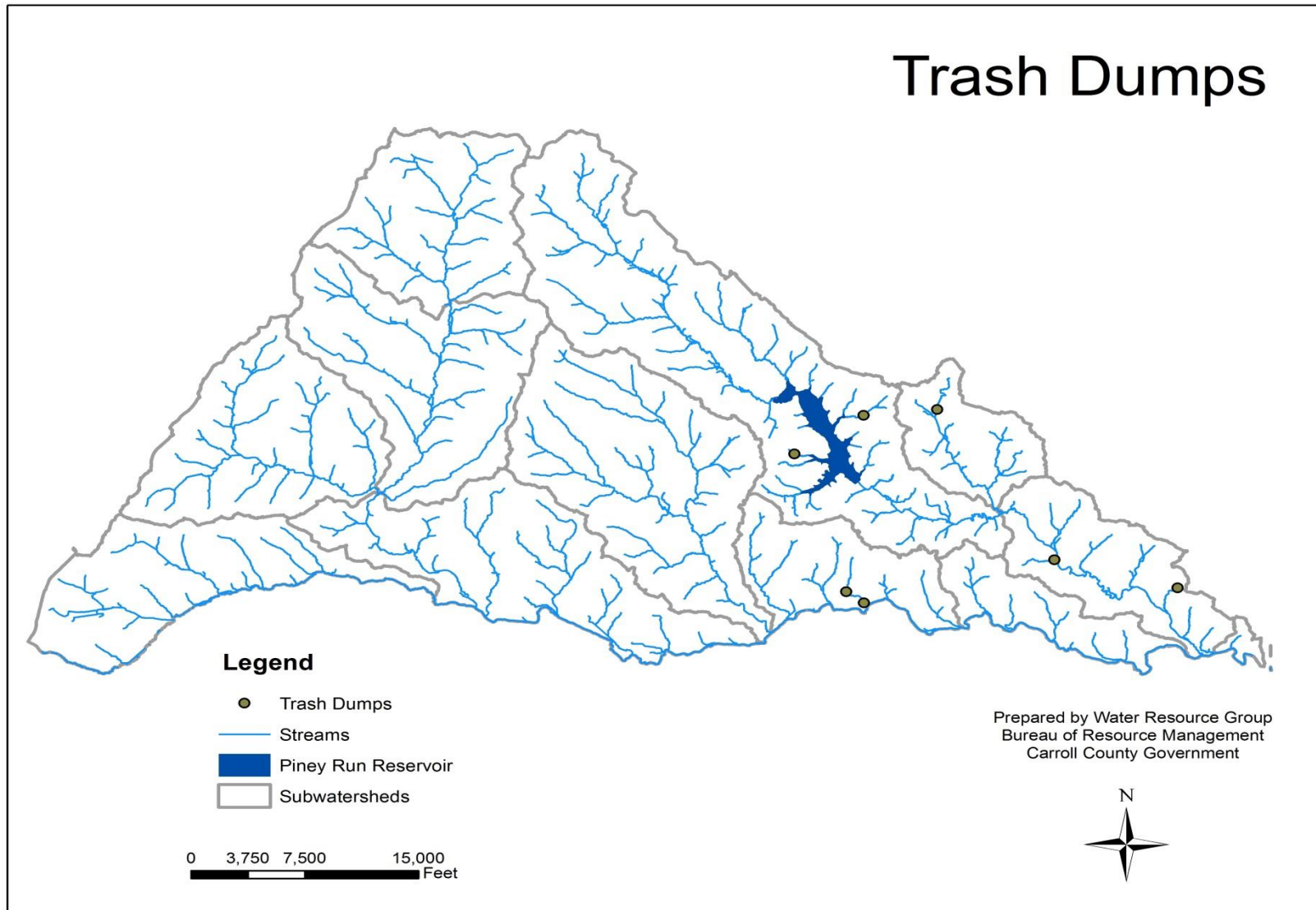


Figure 1-8: Trash Dumps

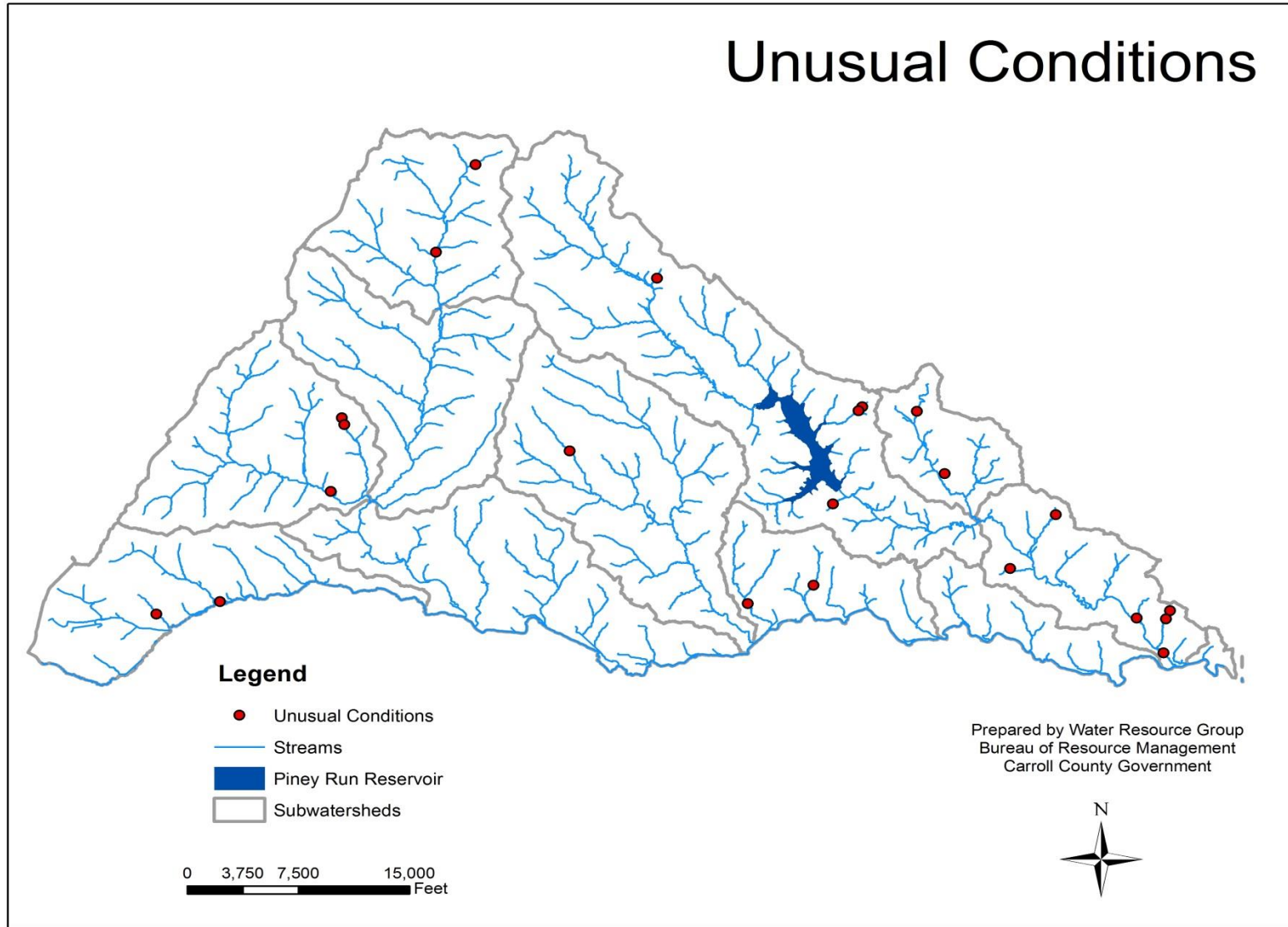


Figure 1-9: Unusual Conditions



## V. Subwatershed Summary

Gillis Falls (1030): Erosion problems were identified along 6,060 linear feet (6%) of the stream channel, with 3,000 feet (50%) feet classified as severely eroded. Inadequate buffers were identified along 16,755 linear feet (8%) of the streambank, with 1,950 feet (12%) classified as severe.

Gillis Falls (1031): Erosion Problems were identified along 4,100 linear feet (5%) of the stream channel, with 1,350 feet (33%) classified as severely eroded. Inadequate buffers were identified along 20,425 linear feet (14%) of the streambank, with 13,200 feet (65%) classified as severe.

Middle Run (1029): Erosion Problems were identified along 3,370 linear feet (3%) of the stream channel, with none being classified as severely eroded. Inadequate buffers were identified along 7,620 linear feet (4%) of the streambank, with 3,875 feet (51%) classified as severe.

Piney Run (1021): Erosion Problems were identified along 5,170 linear feet (9%) of the stream channel, with 3,900 feet (75%) being classified as severely eroded. Inadequate buffers were identified along 6,100 linear feet (5%) of the streambank, with 3,300 feet (54%) classified as severe.

Piney Run (1023): Erosion Problems were identified along 18,760 linear feet (9%) of the stream channel, with 7,750 feet (41%) being classified as severely eroded. Inadequate buffers were identified along 43,130 linear feet (10%) of the streambank, with 16,250 feet (38%) classified as severe.

Piney Run (1024): No erosion problems were identified along this section of stream channel. Inadequate buffers were identified along 300 linear feet (<1%) of the streambank, with none being classified as severe.

South Branch (1028): Erosion Problems were identified along 1,925 linear feet (2%) of the stream channel, with none being classified as severe. Inadequate buffers were identified along 4,900 linear feet (3%) of the streambank, with 4,600 feet (94%) classified as severe.

South Branch (1020): Erosion Problems were identified along 1,190 linear feet (2%) of the stream channel, with 1,100 feet (92%) classified as severely eroded. Inadequate buffers were identified along 1,120 linear feet (1%) of the streambank, with none being classified as severe.

South Branch (1022): Erosion Problems were identified along 5,490 linear feet (9%) of the stream channel, with 1,100 feet (20%) classified as severely eroded. Inadequate buffers were identified along 4,300 linear feet (3%) of the streambank, with none being classified as severe.

South Branch (1025): Erosion Problems were identified along 2,400 linear feet (2%) of the stream channel, with 2,200 feet (92%) classified as severely eroded. Inadequate buffers were

identified along 8,175 linear feet (3%) of the streambank, with 3,800 feet (46%) classified as severe.

Tuckers Branch (1026): Erosion Problems were identified along 6,035 linear feet (5%) of the stream channel, with 4,000 feet (66%) classified as severely eroded. Inadequate buffers were identified along 15,150 linear feet (6%) of the streambank, with 7,600 feet (50%) classified as severe.

## **VI. Summary**

The Bureau is currently developing two plans for the South Branch Patapsco 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**

South Branch Patapsco Watershed Stream Corridor Assessment

**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 15, 2012

Dear Watershed Resident:

The Carroll County Bureau of Resource Management will be conducting a stream corridor assessment of the streams located in the South Branch Patapsco 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.

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, 2012. 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 Technician  
Department of Land Use, Planning and Development  
Carroll County Government  
[bmadigan@ccg.carr.org](mailto: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 (3<sup>rd</sup> 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