

**Loch Raven Reservoir  
Watershed  
Stream Corridor Assessment**

**Winter 2016**

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



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## I. Introduction

A Stream Corridor Assessment of the Loch Raven watershed was conducted during the winter of 2016 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 Loch Raven watershed is located in eastern Carroll County, bordered by Baltimore County, Maryland. Loch Raven watershed drains into the Loch Raven Reservoir, which is part of the Baltimore metropolitan area drinking water supply.

The Loch Raven watershed is managed on the 12-Digit scale and includes one subwatershed. Table 1-1 lists the only subwatershed within the Carroll County portion of Loch Raven watershed as well as its associated drainage and stream lengths. Figure 1-1 shows the location of the study area within Carroll County.

**Table 1-1 Loch Raven Subwatershed**

DNR 12-Digit	Subwatershed	Area (Acres)	Stream Miles
0308	Piney Run	592	2.81
<b>Totals:</b>		<b>592</b>	<b>2.81</b>

## II. Landowner Participation

This assessment evaluated only stream segments on public, Carroll County, and City of Hampstead properties, therefore no mailing was required to request permission for access. Figure 1-2 shows the locations that were assessed. 2.11 of the 2.81 stream miles were assessed within the Loch Raven watershed.

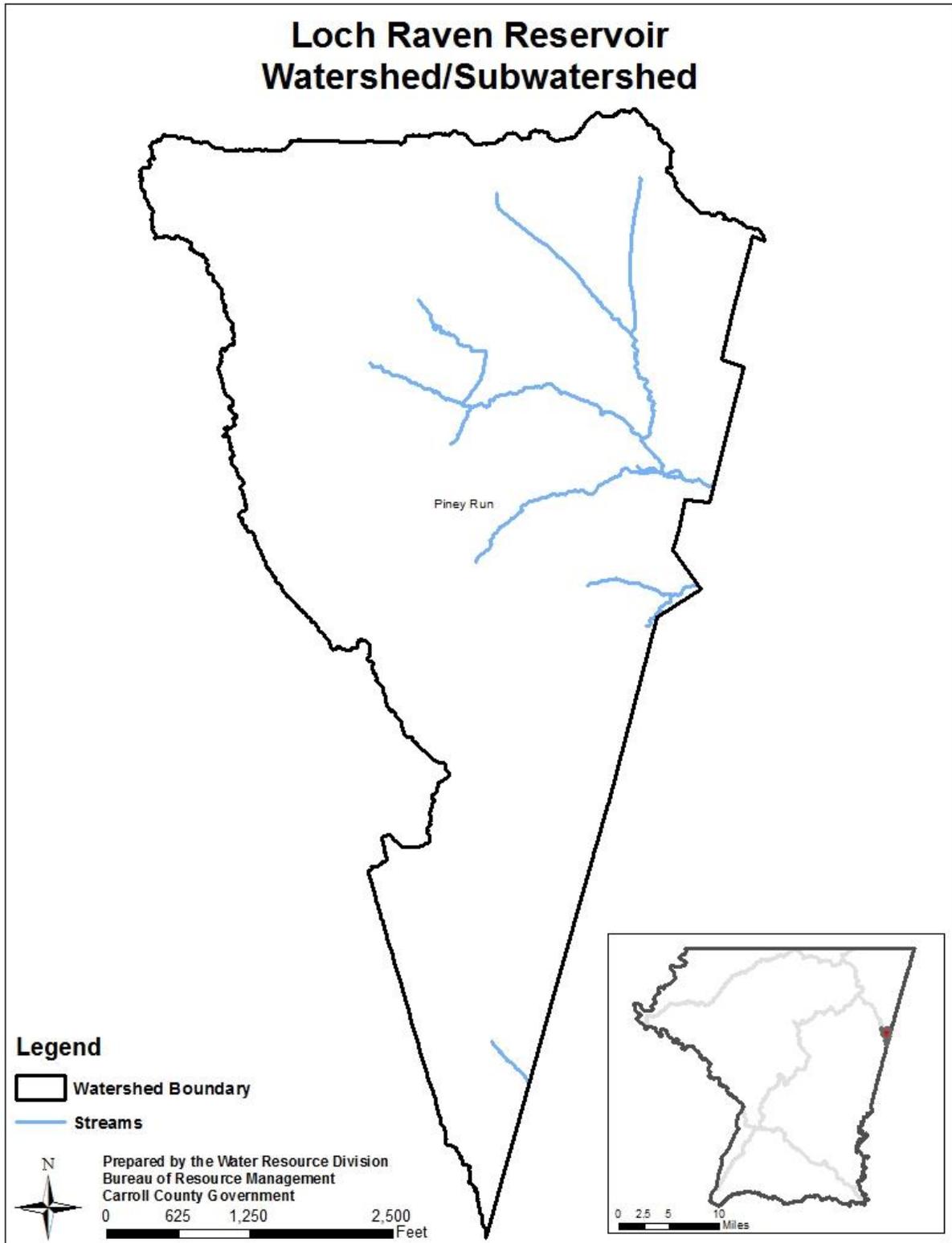


Figure 1-1: Loch Raven Watershed Location Map

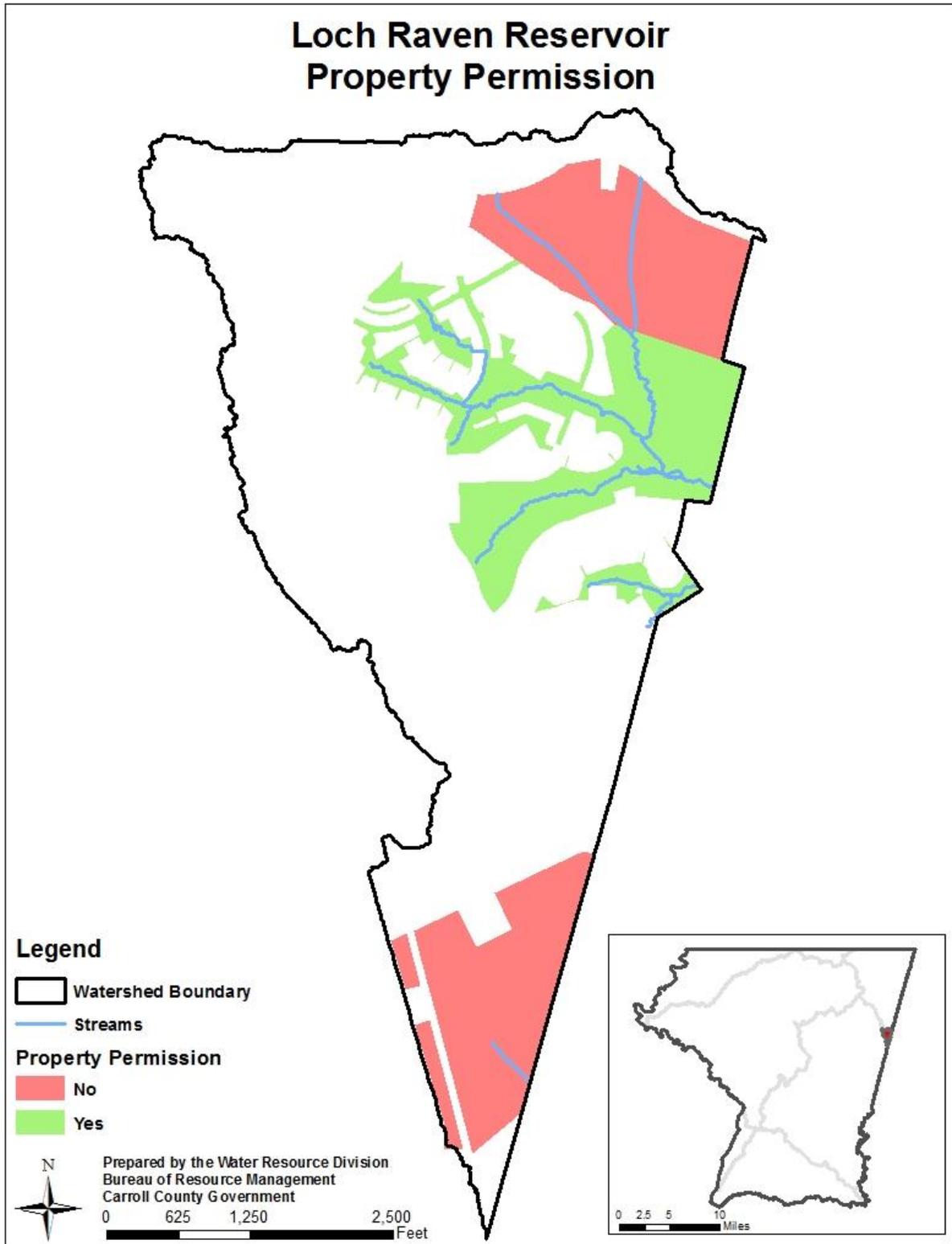


Figure 1-2: Landowner Participation

### 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 18 data points were collected across the watershed. Pipe outfalls were the most frequently identified problem. Erosion along the streambank and inadequate buffers were also regularly present across the watershed. Table 1-2 lists the data points by severity across the entire watershed. 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	3	0	1	1	1	0
Inadequate Buffer	2	0	0	1	0	1
Pipe Outfall	9	1	1	2	1	4
Fish Barrier	1	0	0	0	1	0
Trash Dump	1	0	0	0	0	1
Channel Alteration	2	0	0	0	1	1
Construction	0	0	0	0	0	0
Exposed Pipe	0	0	0	0	0	0
Unusual Condition	0	0	0	0	0	0
<b>Total</b>	<b>18</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>7</b>

## A. Erosion

One of the most common problems identified through the Stream Corridor Assessment was erosion. A total of 1,990 linear feet or 0.38 miles (18%) of the 2.11 miles assessed were found to have an erosion problem, with approximately four percent of the watershed categorized as having a severe erosion problem. Figure 1-3 shows the location of active erosion sites identified during the Stream Corridor Assessment.

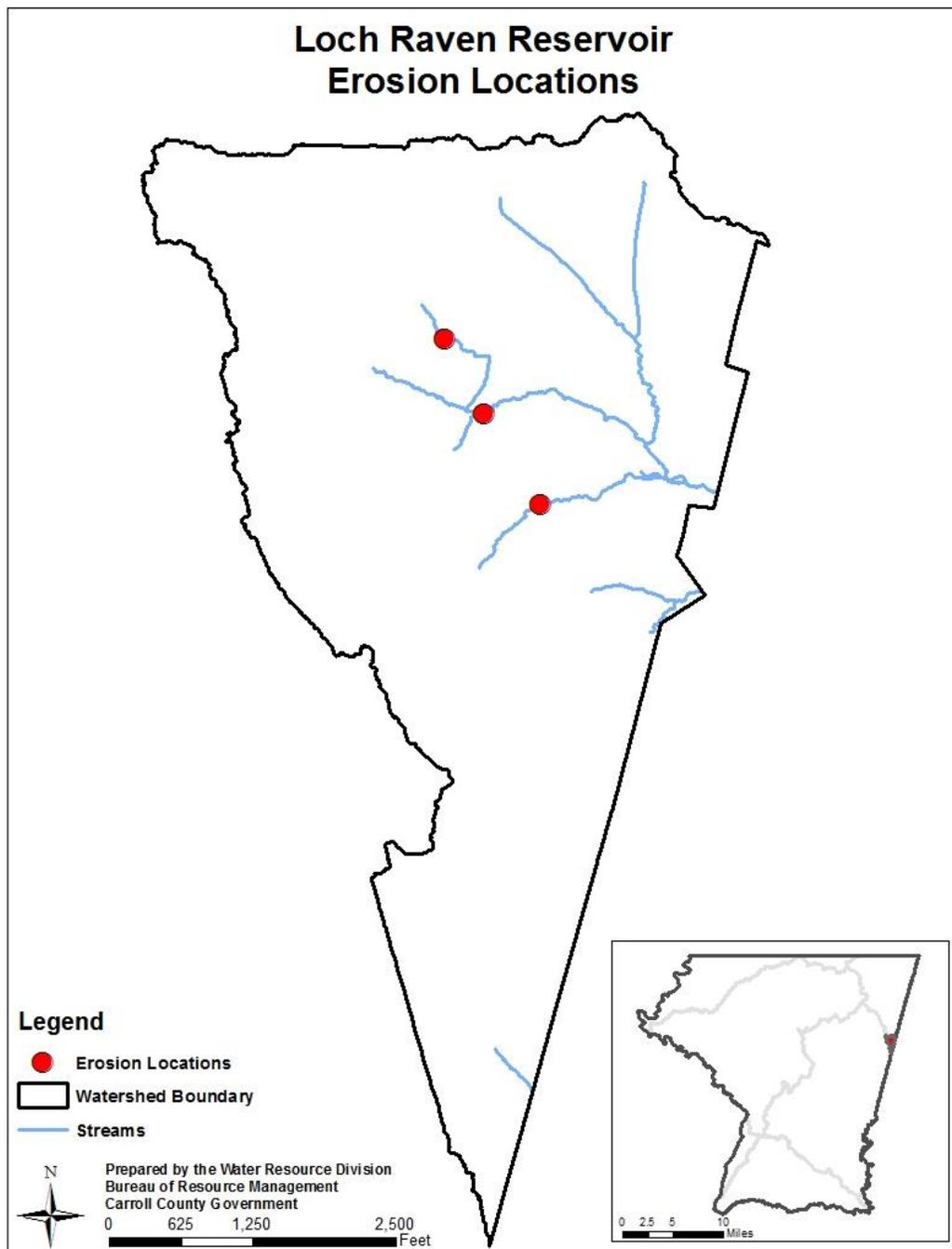


Figure 1-3: Erosion Locations

### B. Inadequate Buffer

Buffer areas were identified as inadequate for 200 linear feet or 0.04 miles (2%) of the streams assessed, with none of the watershed classified as severely un-buffered. One of the two sites identified both sides of the stream as completely unshaded. Neither of the two sites identified had been recently planted. Figure 1-4 shows the location of identified inadequate buffers.

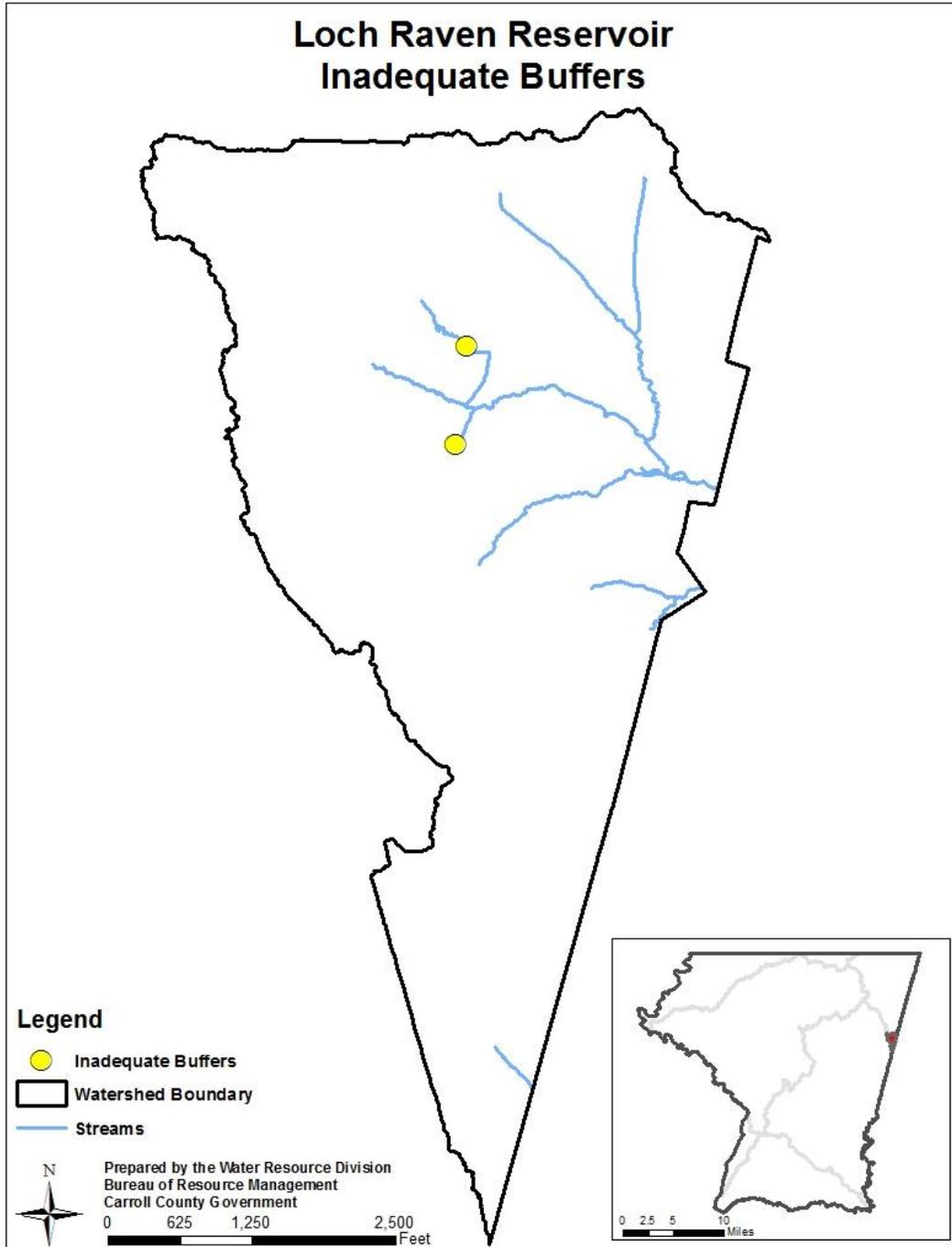


Figure 1-4: Inadequate Buffers

### C. Pipe Outfalls

Outfalls were the most common problem identified during the assessment. The majority of outfalls were in an area of higher density residential land use and were 18" or larger in diameter, but the majority were given a low impact rating. The location of identified pipe outfalls can be found in Figure 1-5.

### D. Exposed Pipes

No exposed pipes were identified during the assessment.

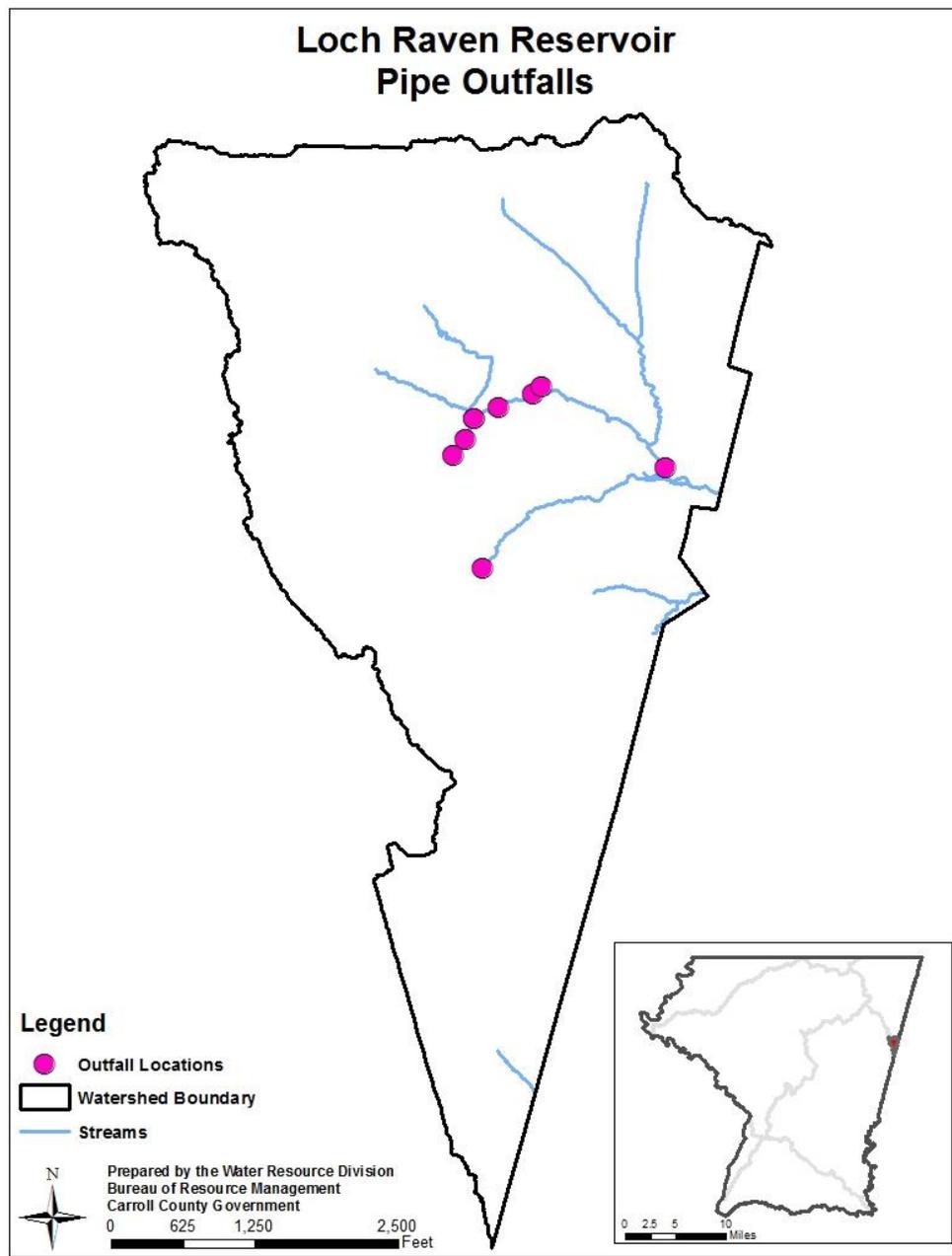


Figure 1-5: Pipe Outfalls

### E. Channel Alteration

Impacts from channel alterations were found at two different sites within the watershed and totaled 140 linear feet. The alterations identified were associated with the protection of infrastructure and were given a minor severity ranking. Figure 1-6 shows the location of identified channel alterations within the watershed.

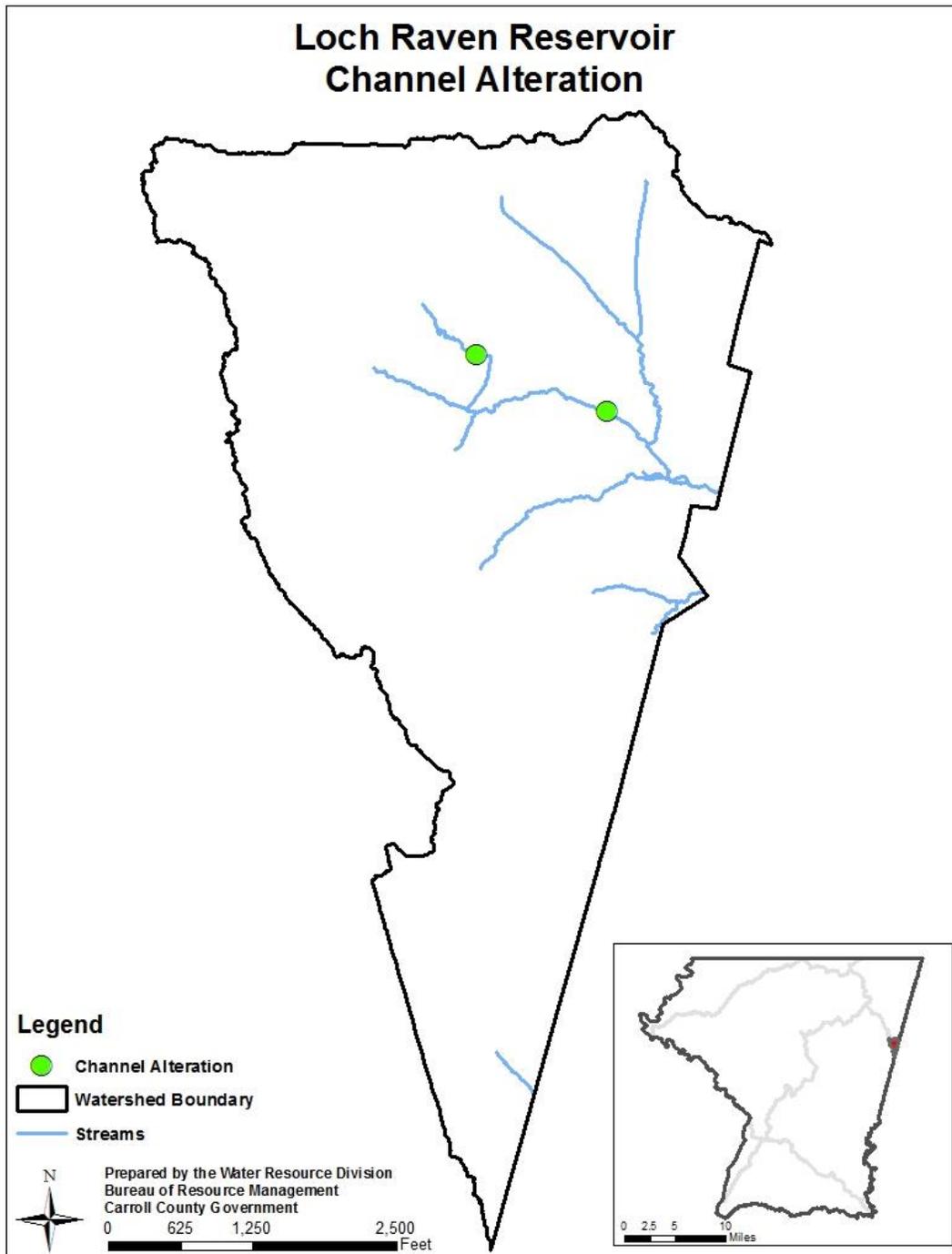


Figure 1-6: Channel Alteration

## F. Fish Barriers

There was only 1 fish barrier identified during the survey which was a road crossing, causing the channel to become too shallow for fish migration. This barrier received a minor severity rating. Figure 1-7 shows the location of the identified fish barrier.

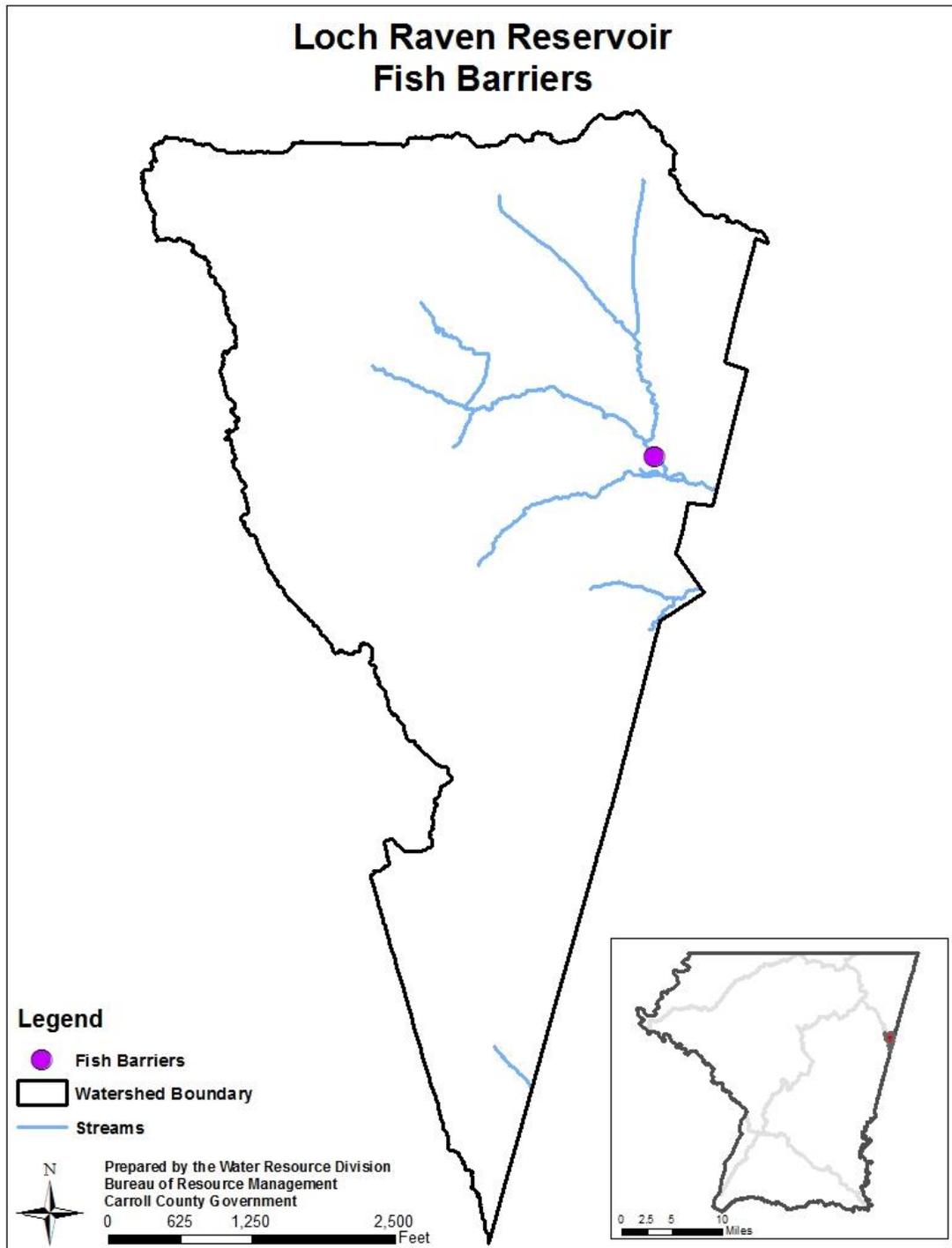


Figure 1-7: Fish Barriers

### G. Trash Dumps

Impacts from trash were minimal with only one identified location within the watershed. This site received a minor severity rating and estimated to have only one truckload of trash. The location of identified trash site can be found in Figure 1-8.

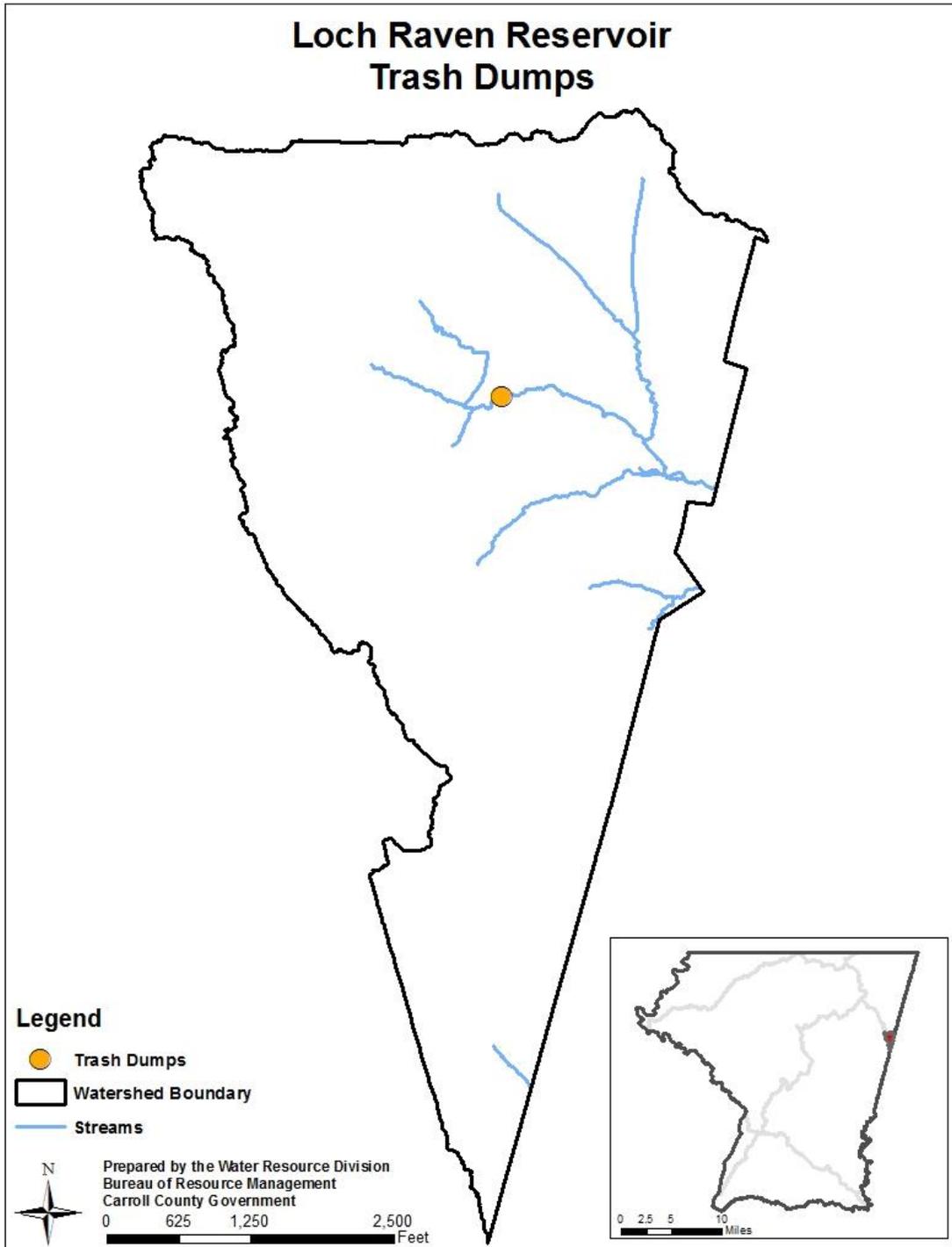


Figure 1-8: Trash Dumps

## **H. In or Near Stream Construction**

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

## **I. Unusual Conditions/Comments**

No unusual conditions were identified during the assessment.

## **V. Subwatershed Summary**

Piney Run (0308): Pipe outfalls were the most numerous category identified within the watershed with nine locations identified. The majority of outfalls received minor severity ratings, but many of the outfalls had pipe diameters greater than 18 inches and two were received higher severity ratings. Erosion problems were identified along 1,990 linear feet (18%) of the stream channel, with 200 feet (10%) classified as severely eroded. Inadequate buffers were identified along 200 linear feet (2%) of the streambank, with none classified as severe. Channel alteration was identified along 140 linear feet (1%) of the stream channel, but both locations received minor severity ratings. Pipe outfalls were the most numerous category identified within the watershed

## **VI. Summary**

The Bureau is currently developing two plans for the Loch Raven Reservoir 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:  
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