

Prettyboy Reservoir Watershed Stream Corridor Assessment

Winter 2011

Prepared By
Carroll County Bureau of Resource Management



Table of Contents

I.	Introduction.....	2
II.	Landowner Participation.....	2
III.	Methods	5
IV.	Results.....	5
A.	Erosion	7
B.	Inadequate Buffer.....	7
C.	Pipe Outfalls	10
D.	Channel Alteration	10
E.	Fish Barriers	10
F.	Trash Dumps.....	10
G.	In or Near Stream Construction	15
H.	Exposed Pipes	15
I.	Unusual Conditions/Comments	15
V.	Subwatershed Summary	17
VI.	Summary	17

List of Figures

Figure 1-1	Prettyboy Watershed Location Map	3
Figure 1-2	Landowner Participation	4
Figure 1-3	Most Commonly Identified Impacts	6
Figure 1-4	Erosion Locations	8
Figure 1-5	Inadequate Buffers	9
Figure 1-6	Pipe Outfalls	11
Figure 1-7	Channel Alterations.....	12
Figure 1-8	Fish Barriers	13
Figure 1-9	Trash Sites	14
Figure 1-10	Unusual Conditions.....	16

List of Tables

Table 1-1	Prettyboy Subwatersheds	2
Table 1-2	Data Points by Severity	5
Table 1-3	Stream Corridor Assessment – Identified Impacts	7
Table 1-4	Linear Feet of Inadequate Buffer and Stream Erosion	10

List of Appendices

Appendix A	SCA Permission Letter.....	18
Appendix B	Impairment Severity Criteria	20

I. Introduction

A Stream Corridor Assessment of the Prettyboy watershed was conducted during the winter of 2011 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 Prettyboy watershed is located in northeastern Carroll County, bordered by Baltimore County, Maryland and York County, Pennsylvania. Within Carroll County the Prettyboy watershed is the northwestern portion of the Gunpowder River basin. Prettyboy watershed drains into the Prettyboy Reservoir, which is part of the Baltimore metropolitan area drinking water supply.

The Prettyboy watershed is managed on the 12-Digit scale and includes five subwatersheds. Table 1-1 lists the subwatersheds within Prettyboy 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 Prettyboy Subwatersheds

DNR 12-Digit	Subwatershed	Area (Acres)	Stream Miles
0313	Poplar Run	209	0.7
0314	Georges/Murphy Run	5,043	22.7
0315	Grave/Indian Run	3,558	14.9
0316	Gunpowder Falls	5,225	26.2
0317	South Branch Gunpowder	6,990	33.0
Totals:		21,025	97.5

II. Landowner Participation

This assessment reached out to 590 landowners within the Prettyboy 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 80 of the 97 stream miles within the Prettyboy watershed. Figure 1-2 shows where landowner permission was granted to perform the assessment.

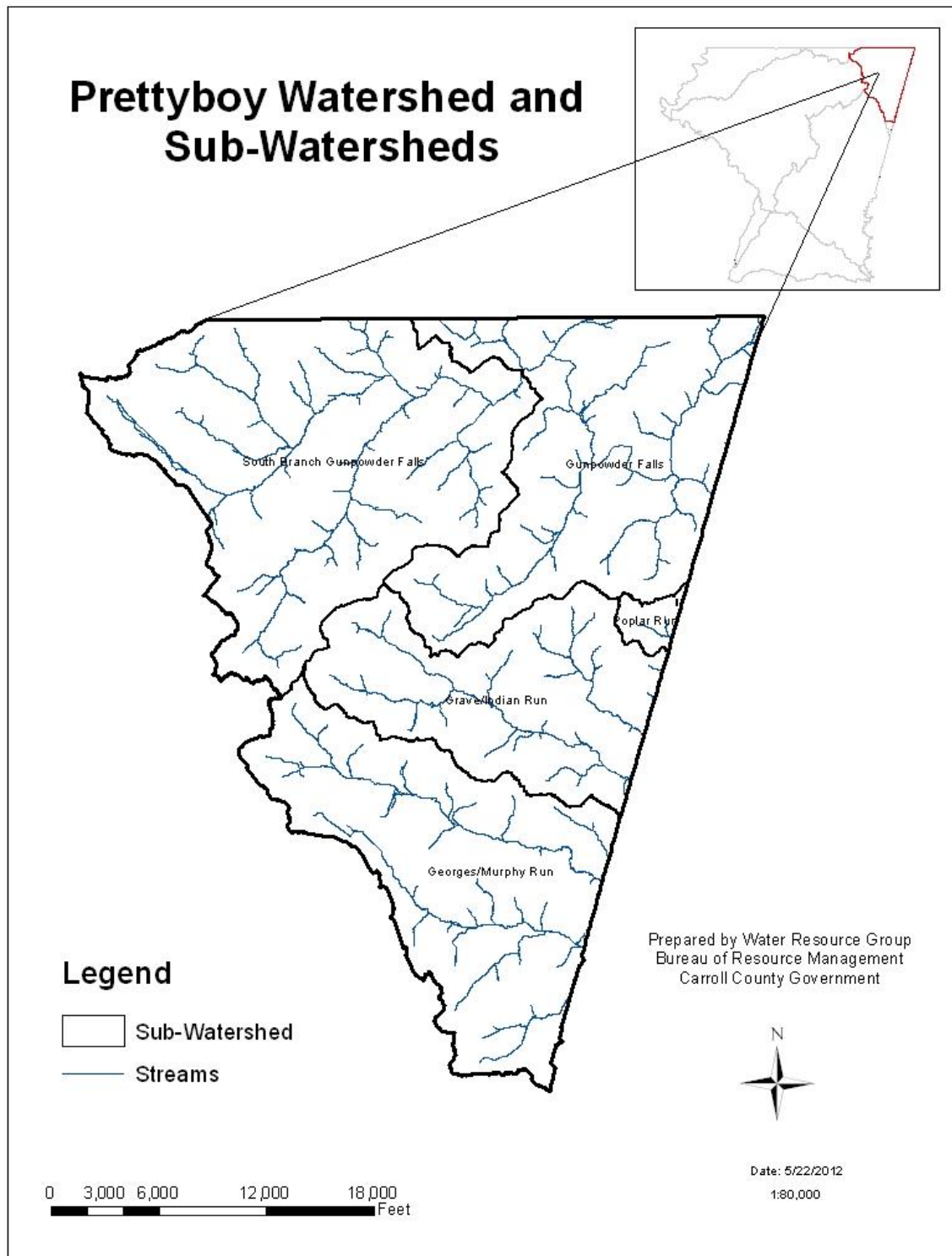


Figure 1-1: Prettyboy Watershed Location Map

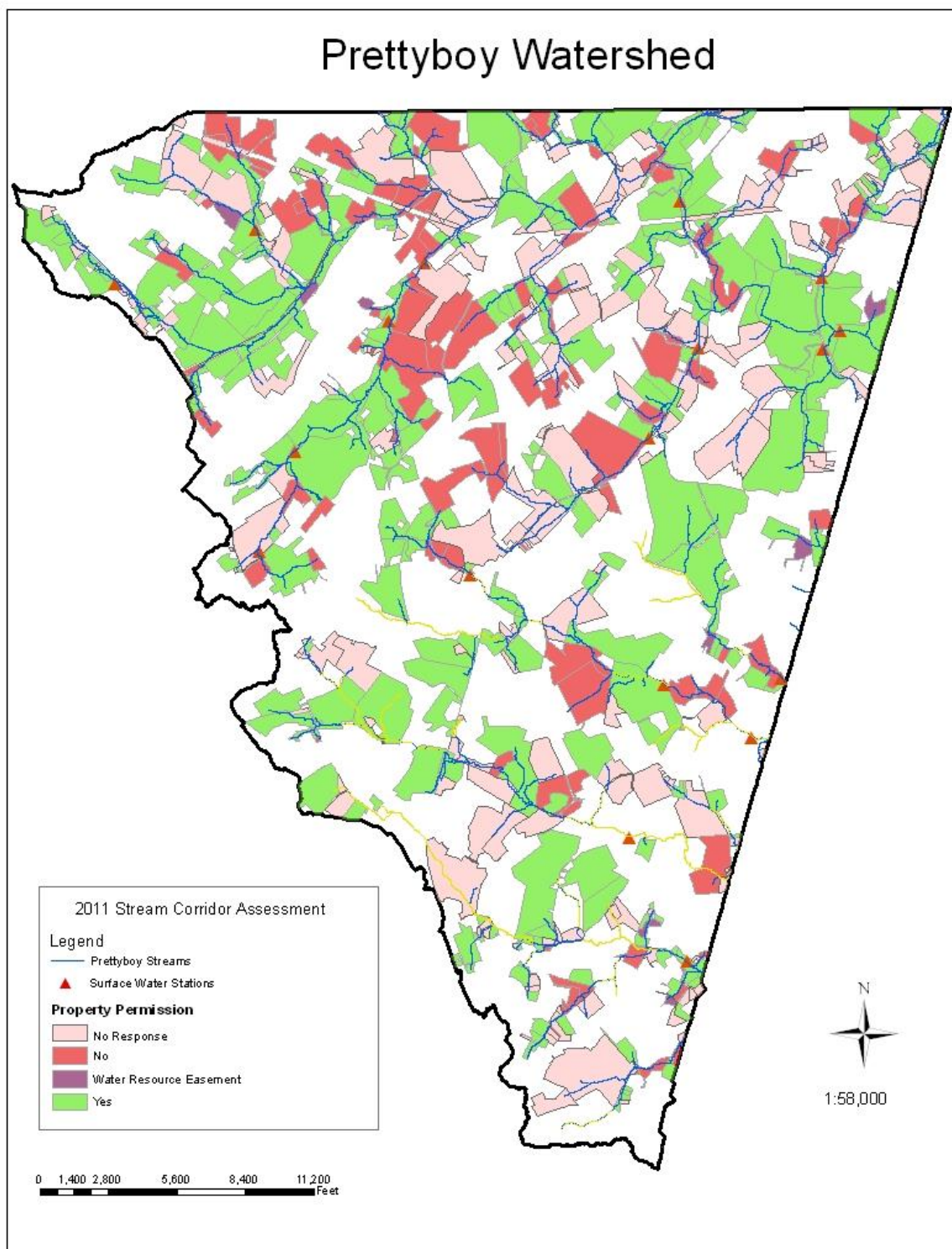


Figure 1-2: Landowner Participation

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 568 data points were collected across the watershed. Inadequate buffers and stream bank erosion were the most frequently identified problems. Drainage pipe outfalls 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	193	12	15	27	28	111
Inadequate Buffer	137	23	45	35	23	11
Pipe Outfall	133	1	1	22	2	107
Fish Barrier	52	0	0	4	0	48
Trash Dump	6	0	0	1	1	4
Channel Alteration	14	0	0	0	0	14
Construction	0	0	0	0	0	0
Exposed Pipe	0	0	0	0	0	0
Unusual Condition	33	1	0	3	6	23
Total	568	37	61	92	60	318

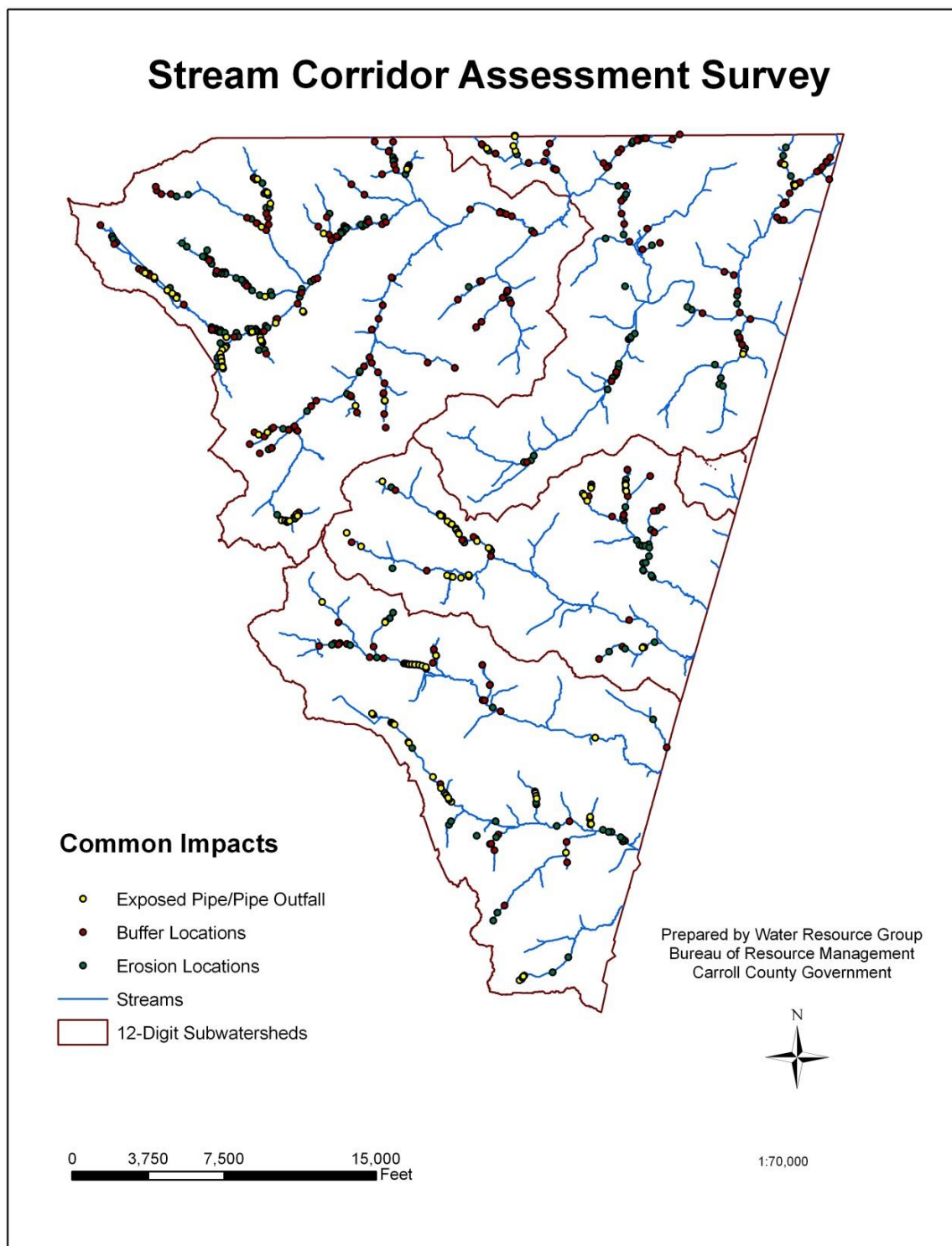


Figure 1-3: Most Commonly Identified Impacts

Table 1-3: Stream Corridor Assessment – Identified Impacts

Stream Segment	Erosion	Fish Barrier	Inadequate Buffer	Trash Dump	Channel Alteration	Pipe Outfalls	Unusual Condition	Total
Poplar Run	0	0	0	0	0	0	0	0
Georges/Murphy Run	31	15	29	1	7	47	13	143
Grave/Indian Run	36	26	21	3	4	28	8	126
Gunpowder Falls	41	6	32	2	2	8	2	93
South Branch Gunpowder Falls	85	5	55	0	1	50	10	206
Total	193	52	137	6	14	133	33	568

A. Erosion

The most common problem identified through the Stream Corridor Assessment was erosion. A total of 11.67 miles (14.5%) of the 80 miles assessed were found to have an erosion problem, with approximately 2.5 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 for 24 miles (30%) of the streams assessed, with 11.7 percent of the entire watershed classified as severely un-buffered. Forty-nine of the sites identified left both sides of the stream completely unshaded, and livestock was noted to be present at 17 different sites. Of the 128 sites identified, 5 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.

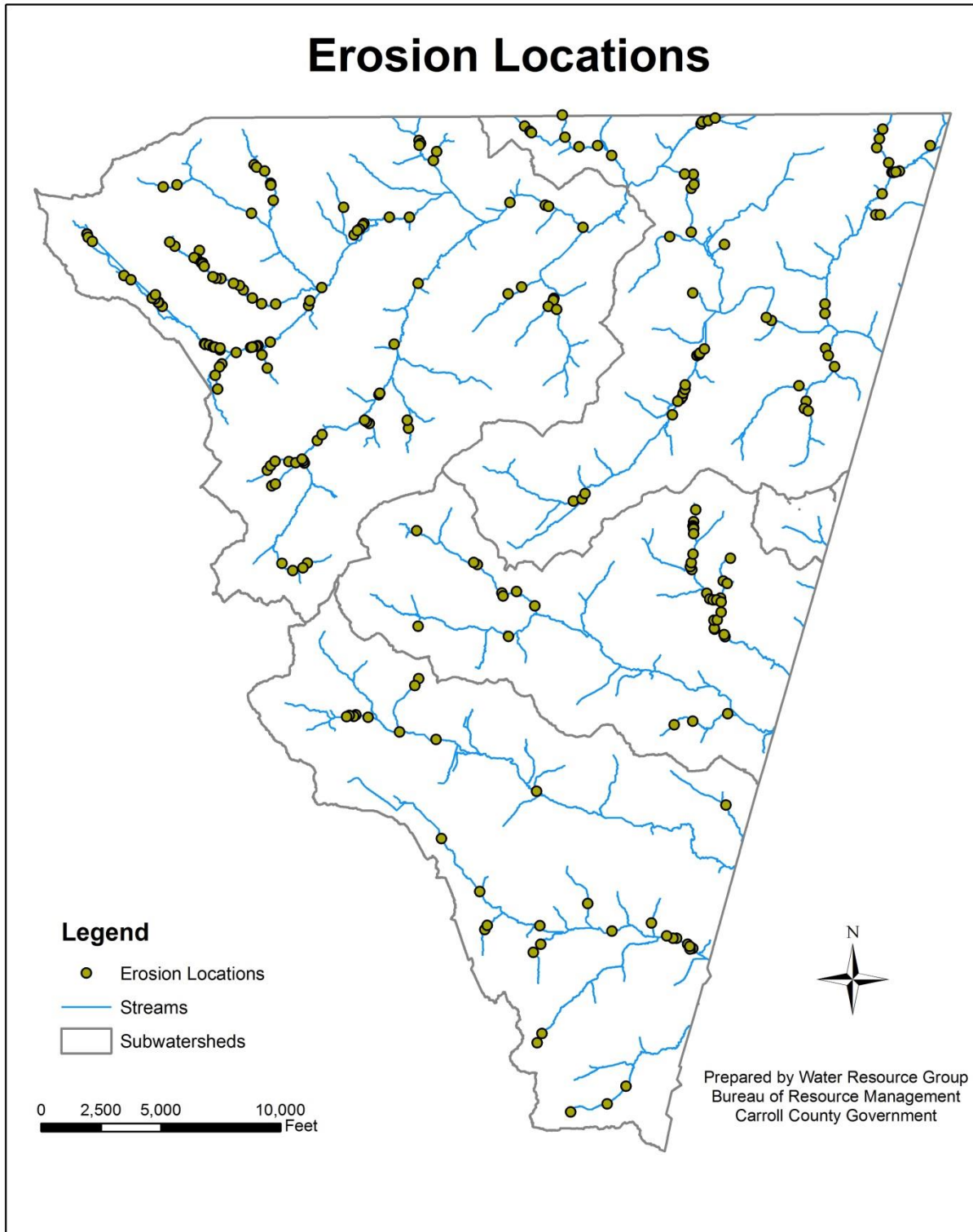


Figure 1-4: Erosion Locations

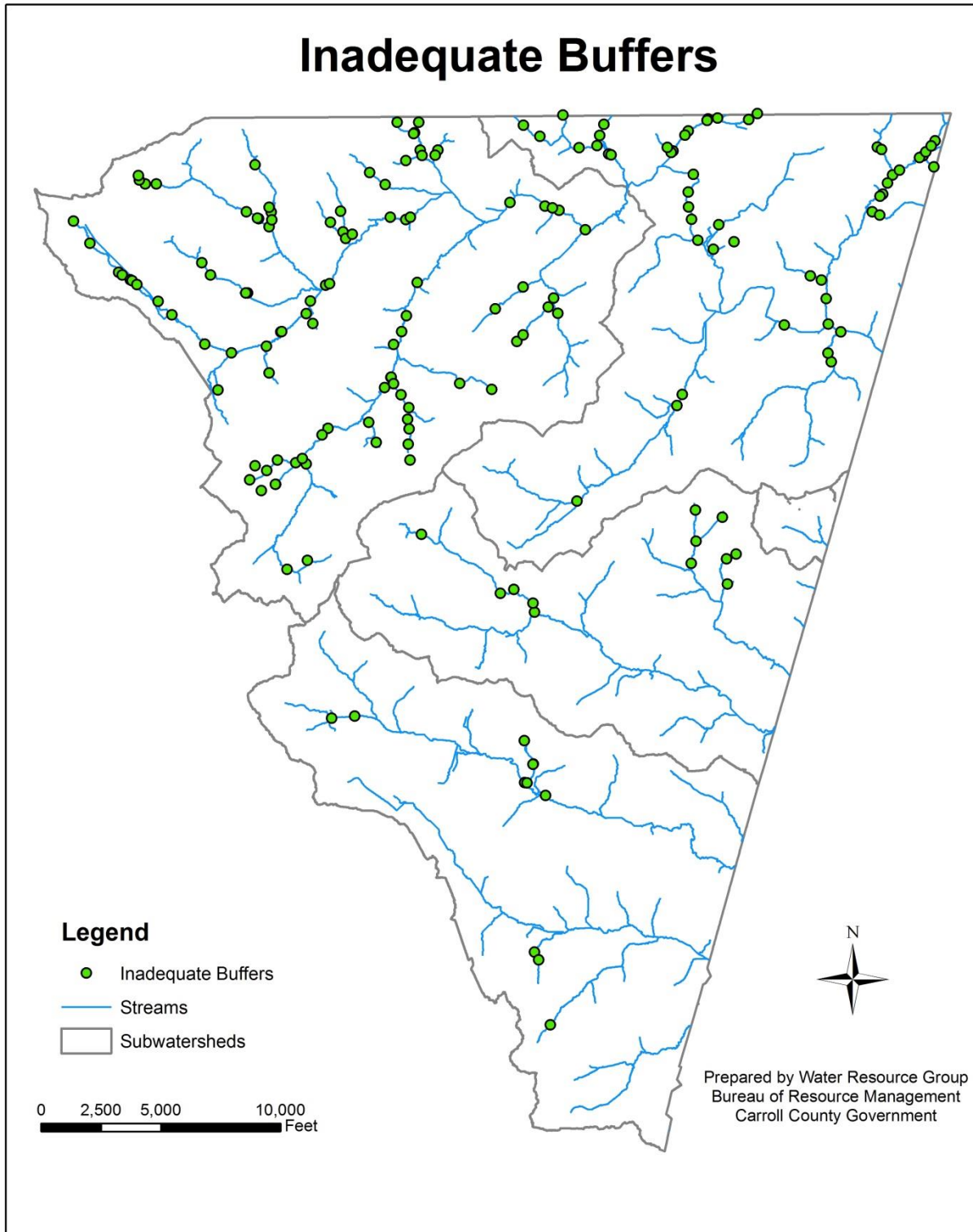


Figure 1-5: Inadequate Buffers

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

Stream Segment	Erosion	Inadequate Buffer
Poplar Run	N/A	N/A
Georges Run	3,352	13,857
Grave Run	5,934	9,122
Indian Run	4,130	8,047
Murphy Run	9,919	23,347
South Branch Gunpowder Falls	30,019	52,805
Gunpowder Falls	8,265	19,825
Total	61,619	127,003

C. Pipe Outfalls

Outfalls were found throughout the entire watershed, but the highest concentrations were located in South Branch, Georges and Murphy Run. This higher concentration can be attributed to the towns of Hampstead and Manchester, which make up the headwaters of these three subwatersheds. The majority of the outfalls identified were 6” or less in diameter and were given a low impact rating. The location of identified pipe outfalls can be found in Figure 1-6.

D. Channel Alteration

Impacts from channel alterations were found at 14 different sites within the watershed and totaled 11,809 linear feet. The alterations identified were associated with the protection of infrastructure and were given a minor severity ranking. Figure 1-7 shows the location of identified channel alterations within the watershed.

E. Fish Barriers

There were 52 fish barriers identified during the survey, 26 of which were in the Grave/Indian Run subwatershed. All of the sites were associated with either temporary debris dams or perched road culverts. Four of the sites identified significantly restricted fish movement upstream and received a moderate severity rating. Figure 1-8 shows the location of identified fish barriers.

F. Trash Dumps

Impacts from trash were found at 6 different locations within the watershed; all of the sites had a moderate to minor severity rating, with the largest site estimated to have approximately 3 truckloads of waste. The location of identified trash sites can be found in Figure 1-9.

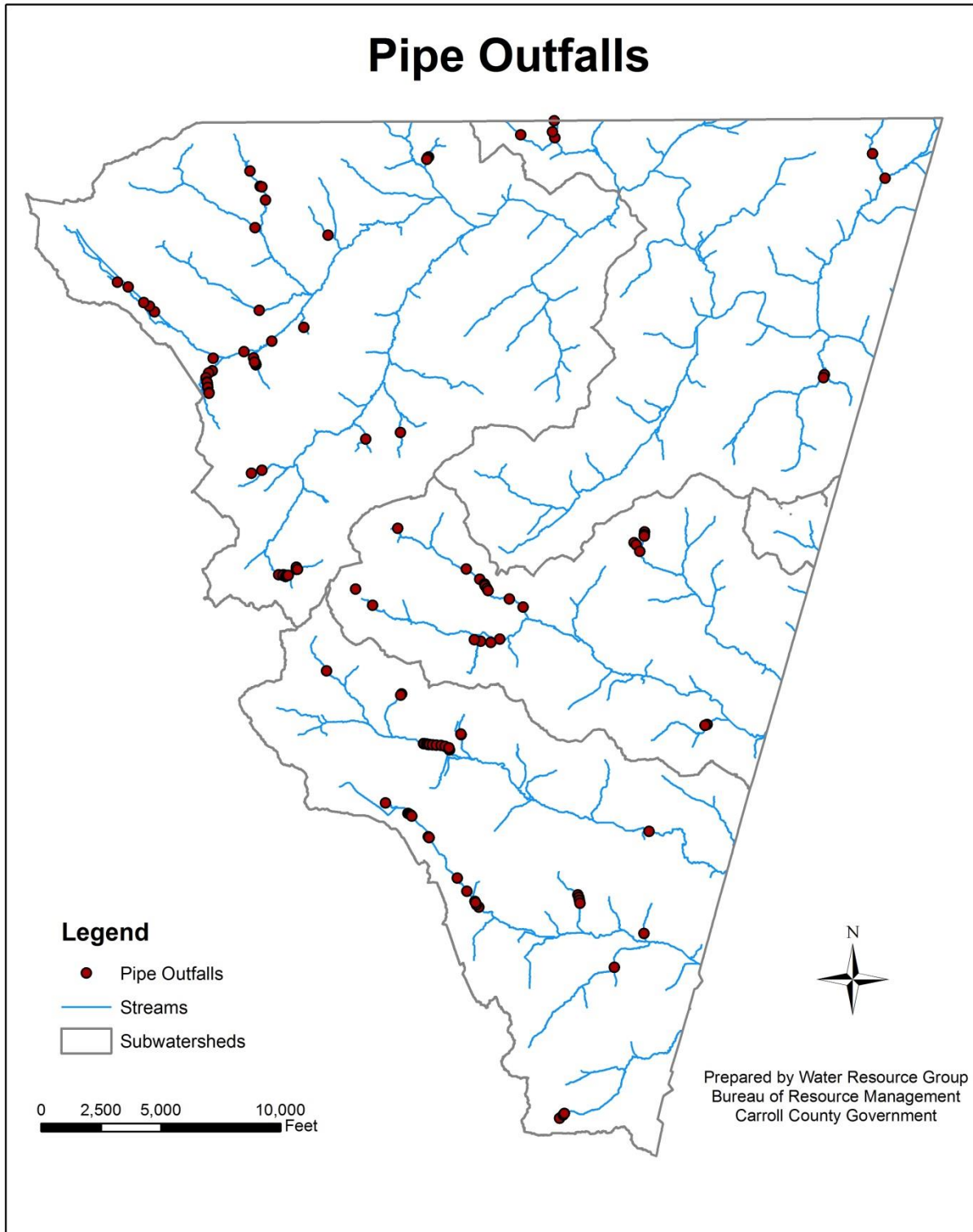


Figure 1-6: Pipe Outfalls

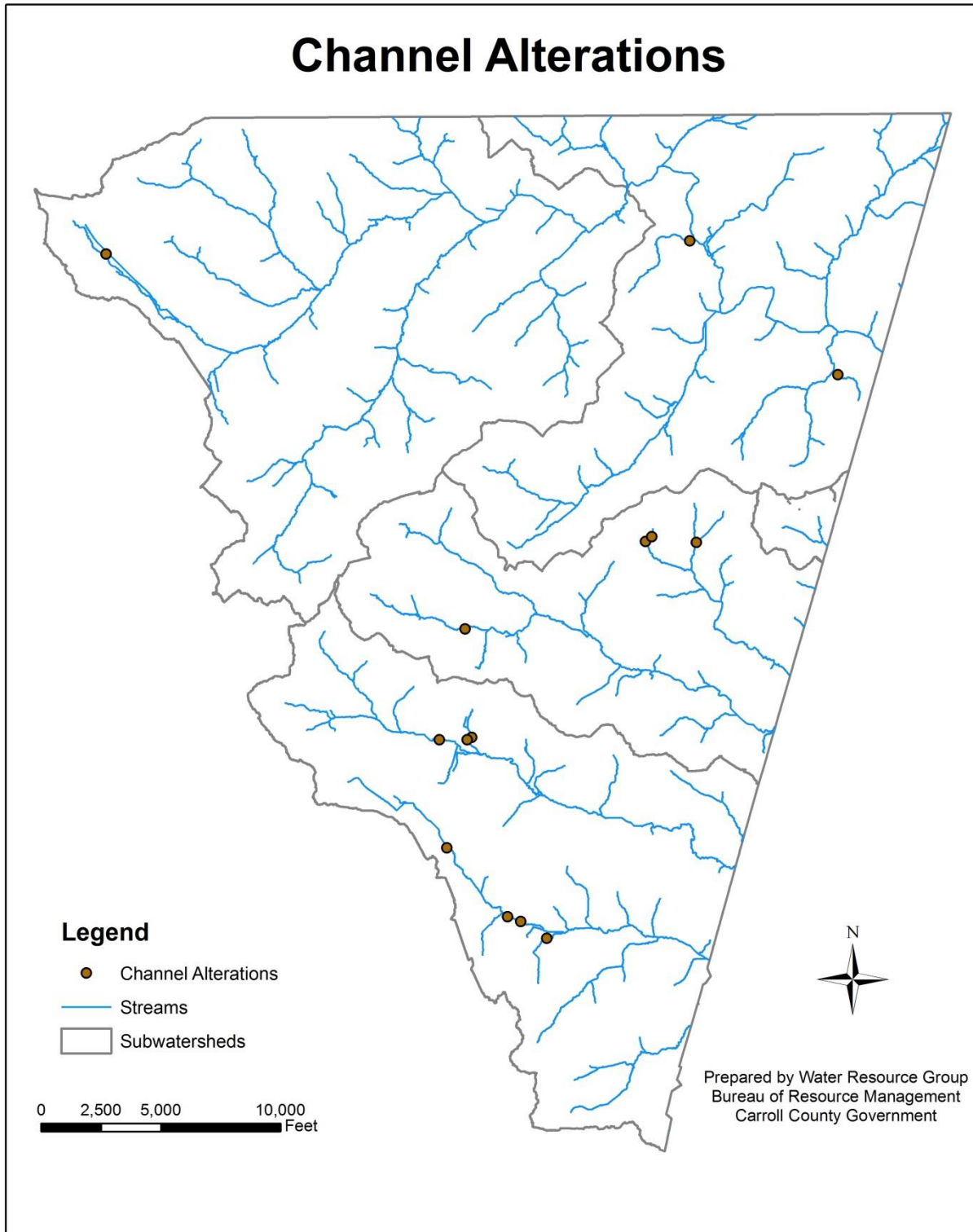


Figure 1-7: Channel Alterations

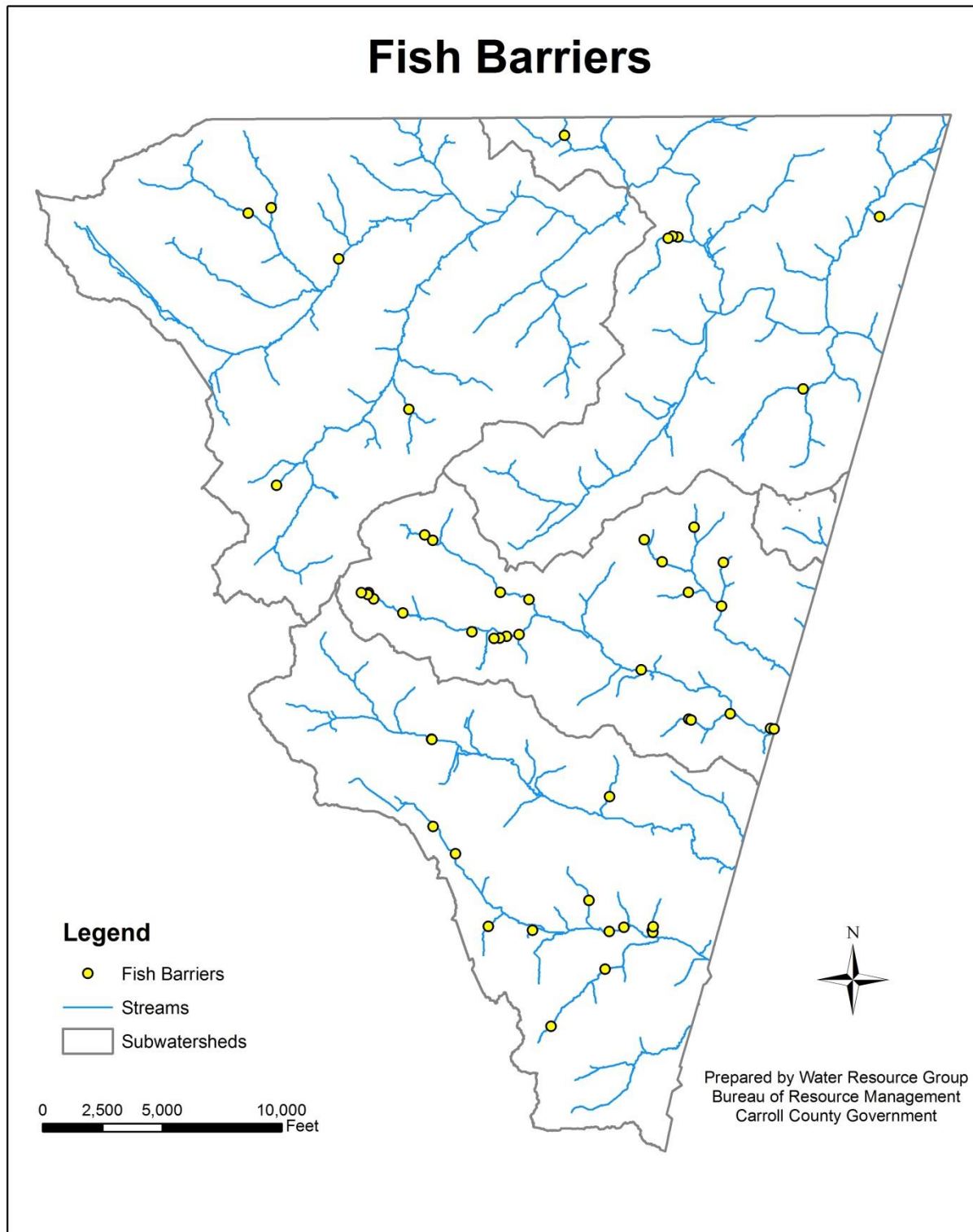


Figure 1-8: Fish Barriers

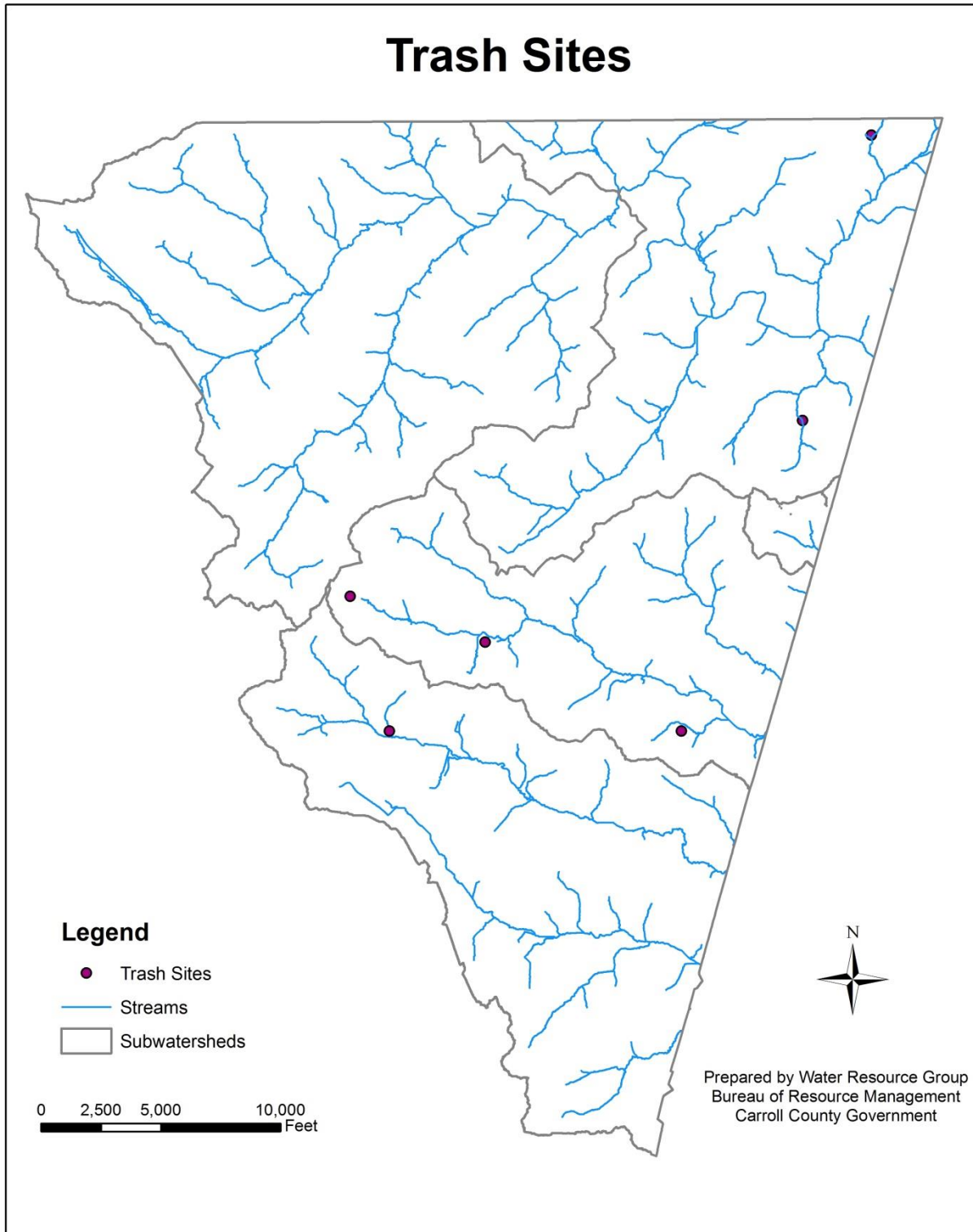


Figure 1-9: Trash Dump Locations

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

Field crews identified 33 unusual conditions during the assessment. The majority of the unusual conditions were comment based, but one was associated with stormwater runoff that was causing an unusual headcut to develop on the edge of a crop field. The location of these can be found in Figure 1-10.

Due to the relative rural nature of the Prettyboy watershed, problems associated with channel alterations, trash dumps, exposed pipes, and in-stream construction were limited.

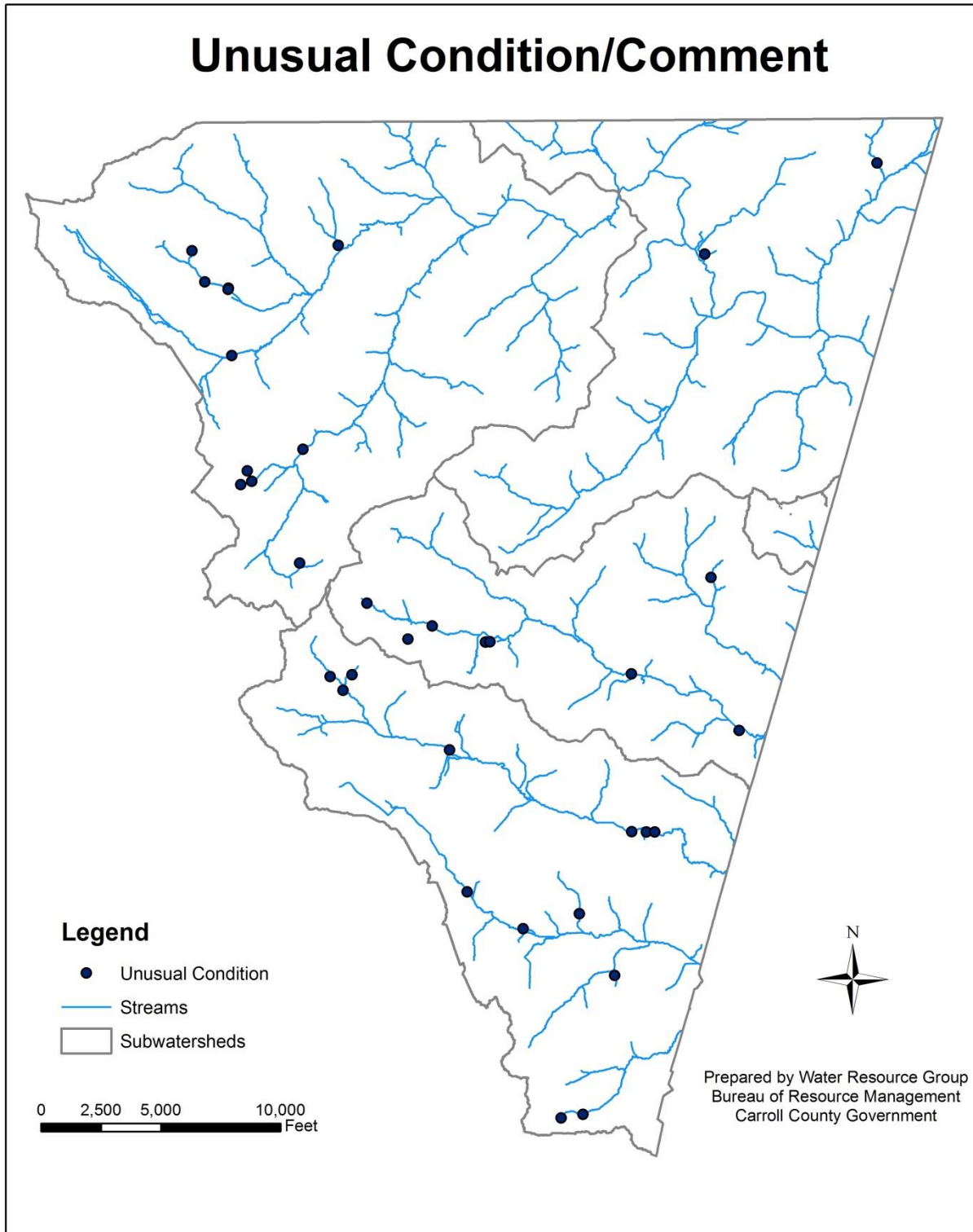


Figure 1-10: Unusual Conditions

V. Subwatershed Summary

Murphy Run: Murphy Run had the highest percentage of severe erosion and the highest percentage of inadequate buffer identified as severe. Erosion problems were identified along 9,919 linear feet (16%) of the stream channel, with 5,113 feet (8%) classified as severely eroded. Inadequate buffer was identified along 23,347 linear feet (38%) of the streambank, with 16,227 feet (26.6%) classified as severe.

Indian Run: Indian Run had the next highest percentage of severe erosion, with the second highest percentage of inadequate buffer identified as severe. Erosion problems were identified along 4,130 linear feet (18%) of Indian Run, with 1,700 feet (7%) classified as severely eroded. Inadequate buffer was identified along 8,047 linear feet (34%) of the streambank, with 6,194 linear feet (26.5%) classified as severe.

South Branch: Erosion problems in South Branch were identified along 30,019 linear feet (17%) of the stream channel, with 4,775 feet (3%) classified as severely eroded. Inadequate buffer was identified along 52,805 linear feet (30%) of the streambank with 20,425 linear feet (11.8%) classified as severe.

Georges Run: Erosion problems in Georges Run were identified along 3,352 linear feet (6%) of the stream channel, with 1,100 feet (2%) classified as severely eroded. Inadequate buffer was identified along 13,857 linear feet (23.5%) of the streambank, with 6,833 linear feet (11.6%) classified as severe.

Grave Run: Erosion problems in Grave Run were identified along 5,934 linear feet (10.6%) of the stream channel, with none being classified as severely eroded. Inadequate buffer was identified along 9,122 linear feet (16.4%) of the streambank, with 5,153 linear feet (9.2%) classified as severe.

Gunpowder Falls: Erosion problems in Gunpowder Falls were identified along 8,265 linear feet (6%) of the stream channel, with none being classified as severely eroded. Inadequate buffer was identified along 19,825 linear feet (14%) of the streambank, with 5,250 linear feet (3.8%) classified as severe.

VI. Summary

The Bureau is currently developing two plans for the Prettyboy 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:

SCA Permission Letter

Prettyboy Reservoir 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, 2010

Dear Watershed Resident:

The Carroll County Bureau of Resource Management will be conducting a stream corridor assessment of the streams located in the Prettyboy Reservoir 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 2011.

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, 2010. 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@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 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