West River Phase 2 Stream Geomorphic Assessment and Rapid Habitat Assessment
June 3, 2025



Prepared by:

Fitzgerald Environmental Associates, LLC.
164 Main Street, Suite 2
Colchester, VT 05446

Fitzgerald Environmental Associates, LLC.
Applied Watershed Science & Ecology

Prepared under contract to:

Vermont Department of Environmental Conservation
1 National Life Drive
Montpelier, VT 05602

VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

EXECUTIVE SUMMARY **5**
1.0 PROJECT AND WATERSHED BACKGROUND **1**
1.1 Project Introduction and Study Goals 1
1.1.1 Project Introduction *1*
1.1.2 Study Goals *2*
1.2 Background Watershed Information 3
1.2.1 Geographic Setting and Land Use History *3*
1.2.2 Geologic Setting *7*
1.2.4 Hydrology and Flood History *9*
1.2.5 Ecological Setting *9*
2.0 DATA COLLECTION **10**
2.1 Data Collection Methods 10
2.2 Quality Assurance 11
2.3 Bridge and Culvert Assessments 12
2.4 Project Identification 12
3.0 PHASE 1 RESULTS **13**
3.1 Results Summary 13
4.0 PHASE 2 RESULTS AND RIVER CORRIDOR PLANNING **19**
4.1 Phase 2 Segment Summary Sheets 19
4.1.1 West River Lower Mainstem - Phase 2 Assessment Summary *21*
4.1.2 West River Central Mainstem - Phase 2 Assessment Summary *27*
4.1.3 West River Upper Mainstem - Phase 2 Assessment Summary *34*
4.1.5 Thompsonburg Brook - Phase 2 Assessment Summary *55*
4.1.6 Flood Brook and Farnum Brook - Phase 2 Assessment Summary *60*
4.2 Phase 2 Results Summary 71
4.2.1 Dominant Adjustment Processes and Stream Type Departure *71*
4.2.2 RHA/RGA *72*
4.2.3 Sensitivity Analysis *76*
5.0 PRELIMINARY PROJECT IDENTIFICATION **79**
5.1.1 Stormwater Runoff *79*
5.1.2 Flood Hazard Zones *79*
5.1.3 Stream Crossings *80*
5.2 Site-Level Project Opportunities 84
5.2.1 High Priority Project Selection for Project Packets *84*
6.0 CONCLUSIONS AND RECOMMENDATIONS **85**
7.0 REFERENCES **87**
8.0 GLOSSARY OF TERMS **88**

Appendices:

Appendix A. Phase 2 Stream Geomorphic Assessment Data
Appendix B. Reach Habitat Data Summary Sheets
Appendix C. VTDEC QA Review
Appendix D. Reach Stressor and Project Identification Maps
Appendix E. Site Level Project Opportunities
Appendix F. Conceptual Designs for High Priority Projects

List of Figures

Figure 1.1. Location map for the West River watershed. 4
Figure 1.2. West River Phase 2 study reaches. 5
Figure 1.3. Land cover map 6
Figure 1.4. Parent surficial materials map 8
Figure 3.1. Reference stream types map 15
Figure 3.2. Phase 1 Impact scores map 16
Figure 3.3. Phase 1 Straightening impacts map 17
Figure 3.4. Buffer impacts map 18
Figure 4.1. West River lower mainstem Phase 2 assessment map 21
Figure 4.2. West River central mainstem Phase 2 assessment map 27
Figure 4.3. West River upper mainstem Phase 2 assessment map 34
Figure 4.4. Winhall River Phase 2 assessment map 52
Figure 4.5. Thompsonburg Brook Phase 2 assessment map 55
Figure 4.6. Flood Brook and Farnum Brook Phase 2 assessment map 60
Figure 4.7. Utley Brook and Jones Brook Phase 2 assessment map 65
Figure 4.8. RHA ratings 74
Figure 4.9. RGA ratings 75
Figure 4.10. Stream sensitivity ratings 78
Figure 5.1. Undersized culvert on Farnum Brook 80

List of Tables

Table 1.1. Percent land cover for mainstem and tributaries 3
Table 1.2. Average slopes of the West River and its tributaries 7
Table 1.3. Frequency and magnitude of flow events in West River watershed 9
Table 2.1. Parameters collected with FIT 10
Table 3.1. Phase 1 summary data 13
Table 3.2. Reference stream type characteristics 14
Table 4.1. Phase 2 segmentation summary 19
Table 4.2. LWD and Pool Ranking for RHA 20
Table 4.3. Summary of stream type departures 71
Table 4.4. Summary of RHA and RGA results 72
Table 4.5. Summary of stream sensitivity results 76
Table 5.1. Summary of culvert data 81
Table 5.2. Summary of bridge data 82

Executive Summary

Fitzgerald Environmental Associates (FEA) were hired by the Vermont Department of Environmental Conservation (VTDEC) in 2022 to complete a Phase 2 Stream Geomorphic Assessment (SGA) and River Corridor Plan for the Upper West River watershed. This study fills in gaps in the current SGA data for the West River watershed and includes areas that were affected by severe flooding in Tropical Storm Irene (August 2011). Two large flood events occurred in the West River watershed in July and December of 2023, and impacts from these floods were included in development of site-level project opportunities. This report describes the results of the Phase 2 SGA and River Corridor Plan. The plan objectives are described below:

1) Develop a basis for understanding the overall causes of channel instability and habitat degradation along the river corridors in the watershed.
2) Collect the information needed to improve river corridor mapping in the study area.
3) Develop a list of preliminary river corridor restoration projects that can be further developed in the future to mitigate flood and erosion hazards and improve ecological integrity and water quality.
4) Prioritize river corridor restoration projects for the watershed.
5) Develop five (5) project packets for high priority restoration sites.

Phase 2 Study

A total of 29 reaches were selected for Phase 2 SGA. All field assessments were completed in 2022 for a total of 34 river miles. A total of 12 reaches were segmented during the field assessments for a total of 42 Phase 2 reaches/segments. Segmentation reasons included impoundment from flood control and hydropower dams (R10 and R22), impoundment from beaver dams (R30 and T14.01), channel evolution (R24, R25, R28, and T11.08), grade control (R19), and reference stream type (R29 and T13.S2.01).

Below is a summary of Phase 2 SGA results for the Upper West River study area:

- Tropical Storm Irene (August 2011) and two flooding events in 2023 (July and December) were major floods along the West River with significant inundation and erosion damage, including the downtown areas of Londonderry and Weston.
- Tropical Storm Irene initiated massive volumes of sediment transport in many of the major tributaries within the study area, excessive sediment transport and deposition continue to impact tributaries and lower portions of the main river study reaches.
- Roadways and to a lesser extent development have encroached significant portions of the mainstem and tributaries within the study area. This encroachment has resulted in deep incision that was the dominant geomorphic process observed in the study.
- Widening, aggradation, and planform adjustment were observed in reaches that were less affected by encroachment, many of these areas were still adjusting to increased sediment loads from recent flooding events.
- Phase 2 rapid habitat assessment (RHA) and rapid geomorphic assessment (RGA) ratings were generally “Fair” throughout the study area. Habitat ratings were driven by reduced woody debris and poor pool coverage and variability due to sediment accumulation and incision. RGA scores were similarly driven by incision. One reach had a RGA score of “Good” primarily due to bedrock control (T12.01).
- 33 bridges and 1 culvert were assessed for geomorphic compatibility and aquatic organism passage. 19 of the bridges had a structure opening less than the reference bankfull channel width,

indicating an increased degree of structure vulnerability to flooding and erosion. The culvert (Batchelders Barn Road) was a significant bankfull constriction (58%) and had a perched outlet preventing aquatic organism passage. The summary tables for bridges and culverts included in this report provides the reference bankfull width for each structure as a reference for municipalities and watershed planners to prioritize structure replacement.

River Corridor Planning and Overall Flood Resiliency Recommendations

- Based on flood damages incurred during Tropical Storm Irene and subsequent floods in 2023, several locations within the Upper West River watershed are vulnerable to flooding during prolonged rainstorms and flashy thunderstorms. The National Flood Insurance Program (NFIP) has developed detailed flood studies and hazard mapping for much of the study area.
- Site level approaches to river corridor restoration were evaluated in detail at the reach scale and are organized in this report by reach. The projects were developed based on the Phase 2 results and watershed-scale mapping of stressors on channel stability. The list of projects is intended to provide a "roadmap" of restoration projects that will reduce future flood hazards and improve ecological conditions in the river corridor. This effort resulted in the identification of 55 restoration project areas, including 26 projects that do not require significant further study (i.e., passive approaches such as buffer plantings and corridor protection), and 29 projects requiring further feasibility study or engineering design (i.e., active restoration approaches such as bridge replacements). Five additional projects were identified for protection of transportation infrastructure adjacent to widening and eroding stream/river channels.
- Project packets were developed for five (5) of the high-priority sites. This process required additional site visits and landowner outreach, mapping, field surveys, and other data collection. The project packets include more detailed information for project implementation and cost estimates for final design, permitting, and implementation.

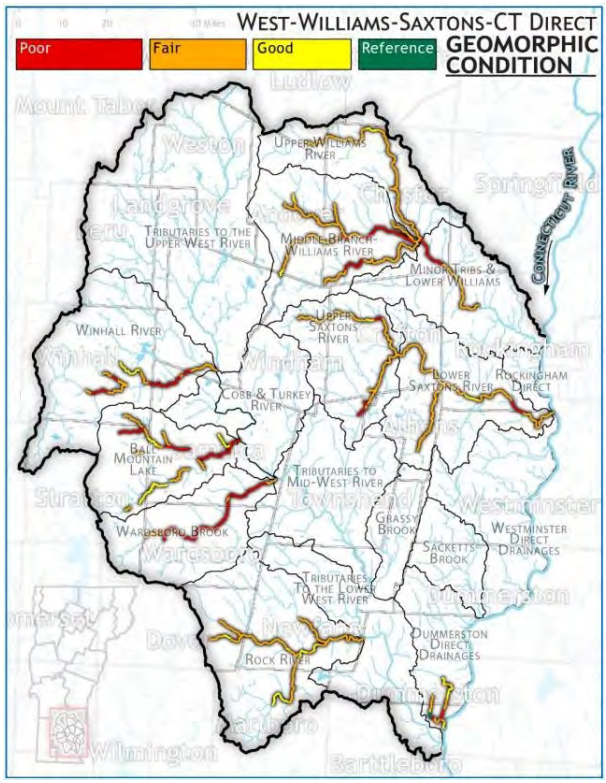
1.0 Project and Watershed Background

1.1 Project Introduction and Study Goals

1.1.1 Project Introduction

The West River is the largest watershed draining to the Connecticut River in southeastern VT with an approximate drainage area of 423 square miles. The watershed has relatively low levels of development and agriculture and has large areas of dense forest cover. The watershed is a critical wildlife corridor and has high concentrations of rare threatened and endangered species. Biological condition monitoring in the West River watershed shows results that are typically fair to excellent, with numerous excellent sites in the Upper West River watershed.

Geomorphic assessment of the Upper West River watershed was identified as a priority strategy in the Tactical Basin Plan (VTDEC, 2021). VTDEC has been working to collect SGA data within the West, Williams, Saxtons, and CT Direct Tactical Basin for over 10 years. The SGA data, along with associated River Corridor Plans and outreach efforts, are utilized to encourage implementation measures that minimize flooding and erosion hazards, support healthy stream habitat, and protect water quality. Completion of SGA data collection and a River Corridor Plan for tributaries in the Upper West River watershed and portions of the West River main stem will help with this effort and address gaps in management strategies for the entire West River watershed.



SGA map from Basin 11 Plan

Stream Geomorphic Assessments and River Corridor Plans were previously completed for several of the significant tributaries, primarily in the middle and lower portions of the West River watershed. Assessments in the Winhall River and Wardsboro Brook watersheds were completed shortly after Tropical Storm Irene with poor geomorphic conditions found through most of the study area. The Rock River and Ball Mountain Brook watersheds were assessed prior to Tropical Storm Irene, however geomorphic conditions were typically fair (Rock River) and fair/poor (Ball Mountain Brook). This project continued Phase 2 assessments and river corridor planning, focusing on the Upper West River watershed and portions of the main stem in areas that are not affected by dams or located in confined valleys. The main stem reaches for this study included M10-M13, which are affected by large sediment loads from Ball Mountain Brook and Wardsboro Brook, and a long section of the mainstem (M18-M30) starting upstream of the confluence with the Winhall River. Three (3) tributaries (Thompsonburg Brook, Flood Brook, and Utley Brook), and two (2) sub-tributaries (Farnum Brook and Jones Brook) were included

in this study. Reach T11.08 on the Winhall River was previously assessed, however it is "sentinel site" for biological criteria monitoring and was re-assessed for this project.

FEA completed Phase 2 SGA's on the following reaches within the study area:

Subwatershed	Assessed Reaches	Assessed Miles
West River (R)	29	24.2
Winhall River (Trib 11)	1	1.3
Thompsonburg Brook (Trib 12)	4	2.5
Flood Brook (Trib 13)	1	0.6
Utley Brook (Trib 14)	4	5.2
Farnum Brook (Trib 13 sub)	1	1.7
Jones Brook (Trib 14 sub)	1	0.4

1.1.2 Study Goals

Watershed restoration projects are most successful when carried out within a context for understanding how reach and watershed-scale stressors cause channel instability. The VTDEC SGA Protocols and River Corridor Planning Guide provides sound, scientifically-defensible methods for identifying stressors on channel stability and restoration projects that will address them appropriately (VTANR, 2010). The overall goal of the VTDEC Rivers Program is to "manage toward, protect, and restore the fluvial geomorphic equilibrium condition of Vermont rivers by resolving conflicts between human investments and river dynamics in the most economically and ecologically sustainable manner," (VTANR, 2010) achieved through:

- Fluvial erosion hazard mitigation;
- Sediment and nutrient load reduction; and
- Aquatic and riparian protection and restoration

The Phase 1 SGA approach (previously completed for the West River study area) compiledn watershed-scale data about the landscape (e.g., soils and land cover) and the stream channel (e.g., slope and form), providing a basis for understanding the natural and human-impacted conditions within the watershed. The SGA data also aids in the identification of specific stressors affecting the physical conditions of the stream channels and structures (e.g., bridges and culverts). Ultimately, the Phase 1 results helped guide planners in selecting reaches for more detailed Phase 2 data collection where this information can be valuable for flood vulnerability mapping, identification of river restoration projects, and long-term river corridor planning. The goal of the Phase 2 assessment effort is to provide:

- A basis for understanding the overall causes of channel instability and habitat degradation along the river corridors in the watershed.
- A list of preliminary corridor restoration projects that can be further developed in the future to mitigate flood and erosion hazards.

1.2 Background Watershed Information

1.2.1 Geographic Setting and Land Use History

The West River watershed is located in southeast Vermont (Figure 1.1) and is one of several large river systems that drain directly to the Connecticut River. The headwaters of the West River are located in the towns of Weston, Mount Tabor, Landgrove, and Peru. From its headwaters, the river flows generally southeast, receiving water from multiple tributaries before discharging into the Connecticut River. The total length of the West River is approximately 54 miles and the total watershed area is approximately 419 square miles.

Land cover data for the West River study area are summarized in Table 1.1 and Figure 1.3. The West River drains primarily undeveloped areas, with forested land representing the dominant cover type. Forested land cover ranges from 81 to 88% in the different subwatersheds. Development is primarily concentrated in lower elevation areas along the river and at high elevations near ski areas. Developed land cover ranges from 1 to 7% in the different subwatersheds.

Table 1.1: Percent land cover for the West River watershed and its tributaries

Watershed	Drainage Area(mi^2)	Agriculture	Development	Forest	Wetland	Other
West River Mainstem (R)	244.0	3%	6%	85%	5%	2%
Winhall River (T11)	8.5	0%	1%	88%	9%	1%
Thompsonburg Brook (T12)	9.0	3%	7%	81%	4%	4%
Flood Brook (T13)	7.7	2%	4%	88%	4%	2%
Farnum Brook (T13.S2)	2.1	5%	4%	88%	1%	2%
Utley Brook (T14)	27.5	2%	3%	85%	8%	1%
Jones Brook (T14.S3)	3.4	1%	3%	86%	10%	0%

Drainage area and land cover area include all areas in the watershed draining to the lowest assessed reach

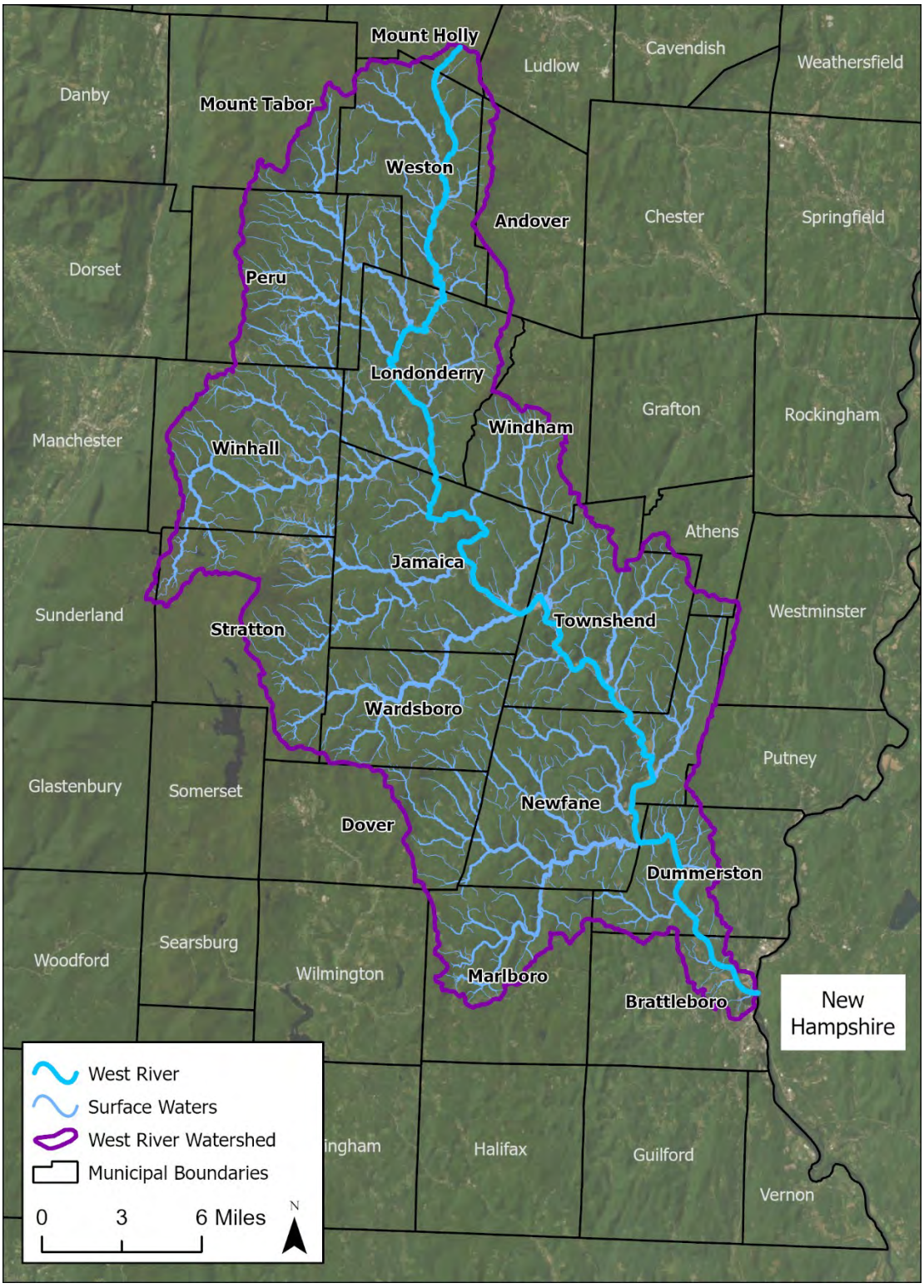


Figure 1.1: Location map for the West River watershed.

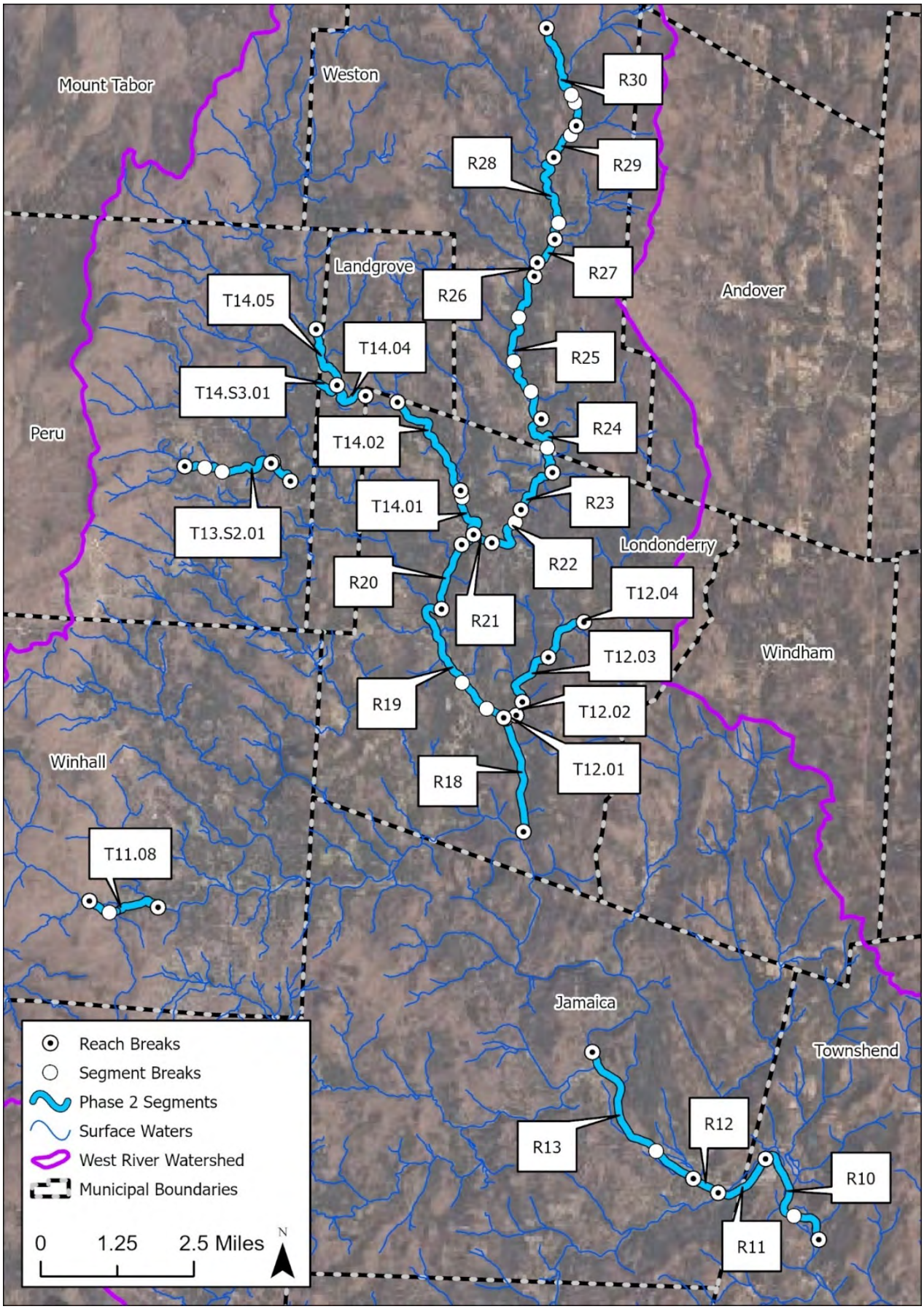


Figure 1.2: West River Phase 2 SGA study reaches.

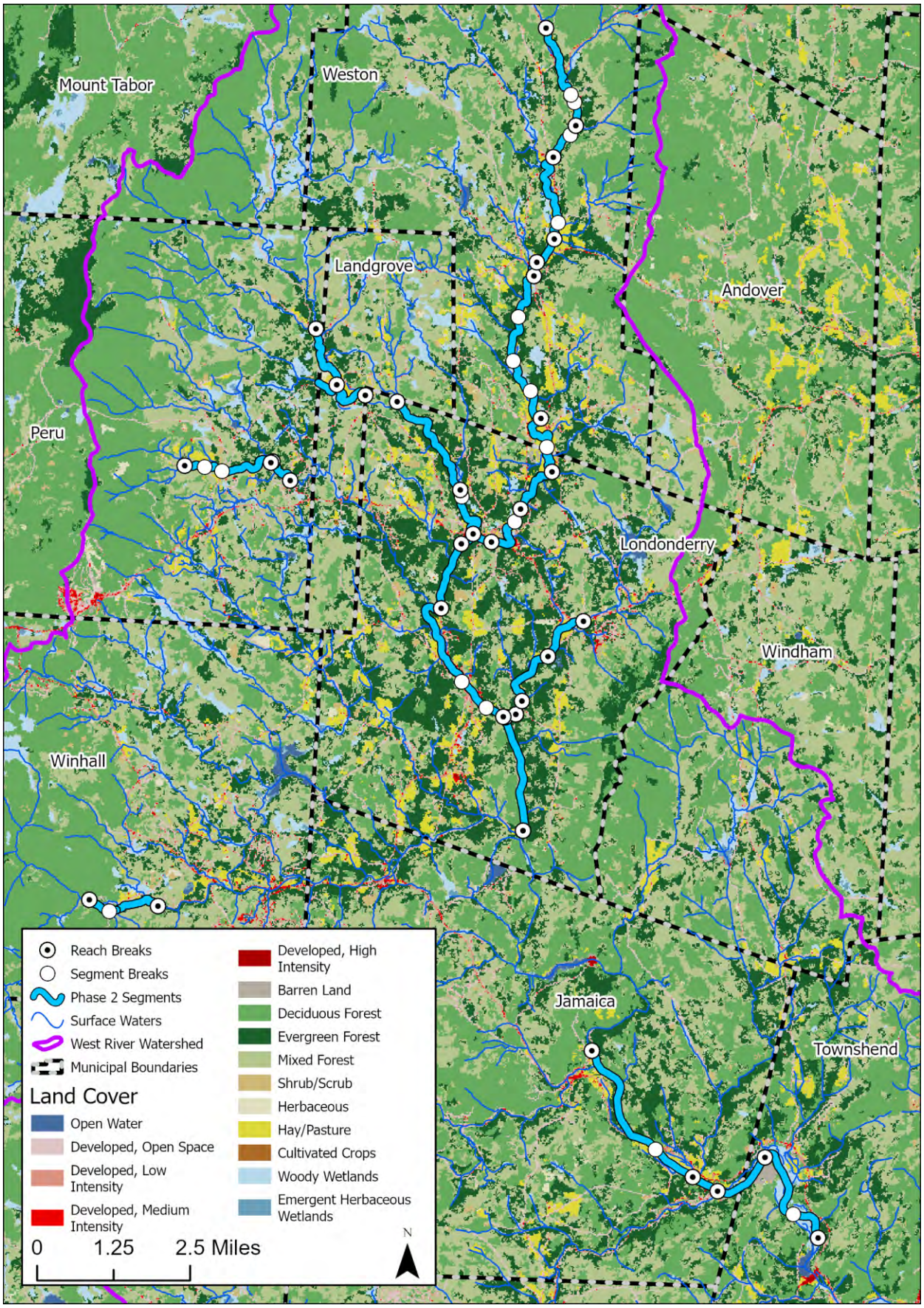


Figure 1.3: Land cover data for the West River study area.

Historical Land Uses

While much of the southern Green Mountains biophysical region was not settled by early Europeans, the lower elevation river valleys were settled and cleared for agriculture. As is true throughout much of the state, many of the forests were cut by early 1900s. The majority of these forests have regrown since then and the area is primarily forested.

1.2.2 Geologic Setting

The geology of the assessed portion of the West River watershed is typical to that of the southern Green Mountains biophysical region. It Is primarily comprised of rocks dating back to the Precambrian period. The bedrock of this region is generally acidic and non-calcareous with several small scattered areas of calcareous bedrock, predominantly along the western and eastern edges of the region. The landforms of the southern Green Mountains were created during the Taconic orogeny. (Thompson and Sorenson, 2019).

In more recent times, geologically speaking, the presence and eventual retreat of glaciers had a significant effect on the surficial geology of the southern Green Mountains. The retreat of the glaciers from Vermont approximately 14,000 years ago, resulted in deposits of till (stony, gravelly sandy loams) blanketing the region. As a result, till makes up a large fraction of the soil in all but the highest elevations where there is exposed bedrock (Figure 1.4). Additionally, glaciofluvial deposits are common in the river valleys.

Geomorphic Setting

The highest elevation on the West River is approximately 2400’ at its headwaters on the slopes of South Mountain in Mount Holly. The lowest elevation is approximately 220’ where it enters the Connecticut River. Table 1.2 lists the average channel slope of the main stem of the West River and its tributaries. Channel slopes were calculated from LiDAR elevation data.

Table 1.2: Average slopes of the West River and its tributaries

Channel (SGA Reaches)	Average Slope
West River Mainstem (R10-R30)	0.73%
Winhall River (T11.08)	1.17%
Thompsonburg Brook (T12.01-T12.04)	1.74%
Flood Brook (T13.04)	2.20%
Farnum Brook T13.S2.01)	3.58%
Utley Brook (T14.01-T14.05)	0.91%
Jones Brook (T14.S3.01)	2.14%

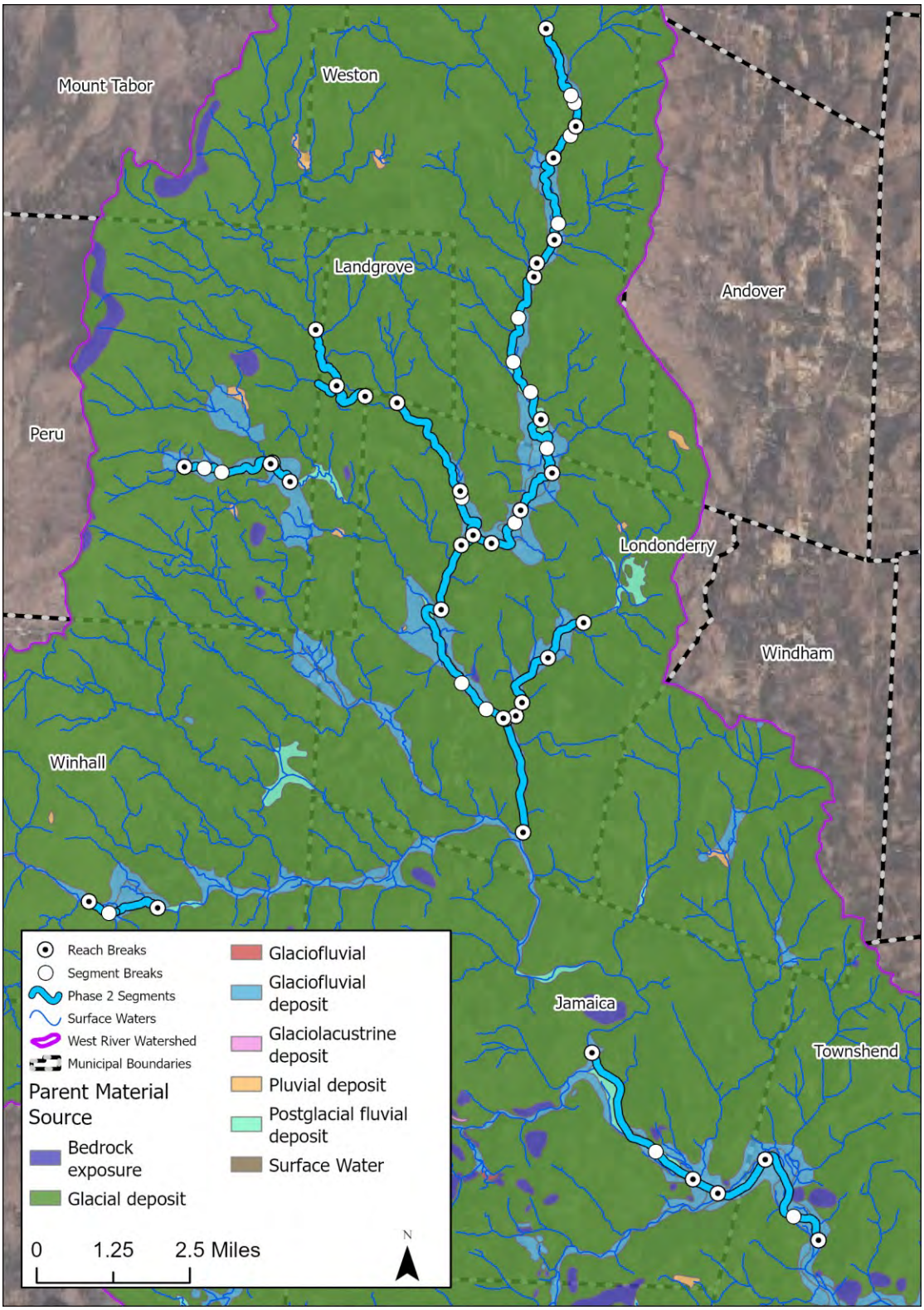


Figure 1.4: Parent surficial materials for the West River study area

1.2.4 Hydrology and Flood History

The United States Geological Survey (USGS) currently operates a real-time flow monitoring gage on the West River in Jamaica (#001155500). The flow monitoring gage is located approximately 1,000 feet upstream of the upstream end of R13-B. The watershed area of 179 square miles represents approximately 75% of the drainage area upstream of the Townshend Dam. The West river gage has been in operation since 1946. The highest flows for West River (29,500 cfs) were recorded following flooding in December of 1948. This discharge is between a 25-year and 50-year flood recurrence interval flow based on a simplified hydrology analysis using the USGS StreamStats interface (Table 1.3). Peak flow rates have been considerably reduced following the construction of the Ball Mountain Dam downstream of the confluence of the Winhall River in 1961.

Table 1.3: Flood frequency estimates at the Jamaica USGS gage

Return Frequency	Discharge (cfs)
2-year	5,880
5-year	8,910
10-year	11,200
25-year	14,500
50-year	17,400
100-year	20,300
500-year	28,700

1.2.5 Ecological Setting

The assessed portions of the West River watershed are located in the Southern Green mountains biophysical region (Thompson and Sorenson, 2019). The topography in the center of this region is a high plateau interspersed with wetlands. Moving east from the center, the elevation drops , forming rolling foothills. As previously noted, the surface geology of the area consists primarily of till of varying soil texture and coarse fragment content.

The climate of the southern Green Mountains is cool at higher elevations, warming in the lower elevations areas east of the high plateau. The growing season ranges from 90 days in the mountains to 120 days in lower elevation areas. Annual precipitation ranges from 70 inches in the mountains to 50 inches in lower elevation areas (Thompson and Sorenson, 2019).

The dominant natural community type in the assessed portions of the West River watershed is Northern Hardwood Forest. While the area is currently primarily forested, many of these forested areas were cleared in the early 1900s, making it difficult to determine what the forest structure and composition were prior to clearing. The high plateau hosts many pockets of wetlands, which are primarily beaver meadows and conifer swamps. Additional small wetlands are found along streams and small tributaries throughout the watershed.

2.0 Data Collection

2.1 Data Collection Methods

The Vermont River Management Program (RMP) has invested many person-years of effort into developing a state-of-the-art system of Stream Geomorphic Assessment (SGA) protocols. The SGA protocols are intended to be used by resource managers, community watershed groups, municipalities and others to identify how changes to land use affect hydro-geomorphic processes at the landscape and reach scale, and how these changes alter the physical structure and biological habitat of streams in Vermont. The SGA protocols have become a key tool in the prioritization of restoration projects that will 1) reduce sediment and nutrient loading to downstream receiving waters such as Lake Champlain and the Connecticut River, 2) reduce the risk of property damage from flooding and erosion, and 3) enhance the quality of in-stream biological habitat. The protocols are based on defensible scientific principles and have been tested widely in many watersheds throughout the state. Data collected for the West River watershed using these protocols formed the basis for preliminary project identification carried out during the Phase 2 SGA.

The SGA protocols include three phases (VTDEC, 2009):

- **Phase 1**: The Phase 1 SGA approach utilizes the Stream Geomorphic Assessment Tool (SGAT), a GIS extension developed by RMP for the collection of reach and watershed scale data. In addition to the GIS and remote sensing effort, a cursory field assessment ("windshield survey") is included for the verification of stream and valley forms, significant channel features and the location of man-made infrastructure. The Phase 1 SGA approach results in watershed-scale data about the landscape (e.g., soils and land cover) and the stream channel (e.g., slope and form), which provides a basis for understanding the natural and human-impacted conditions within the watershed. The SGA data also aids in the identification of specific stressors affecting the physical conditions of the stream channels and structures (e.g., bridges and culverts). Table 2.1 summarizes the parameters collected in Phase 1 using the Feature Indexing Tool (FIT), which include those utilized to develop the final impact ratings.
- **Phase 2**: The Phase 2 approach builds upon Phase 1 data through the collection of reach-specific data about the current physical conditions. Characterization of reach conditions utilizes a suite of quantitative (e.g., channel geometry, pebble counts) and qualitative (e.g., pool-riffle habitat) measurements to calculate two indices: Rapid Geomorphic Assessment (RGA) Score; and Rapid Habitat Assessment (RHA) score. Using the RGA scores in conjunction with knowledge about the background or "reference" conditions, a sensitivity rating is developed to predict the degree to which the channel will adjust to human and natural impacts in the future.

Table 2.1: Parameters collected with FIT.

Phase 1 Step	Phase 2 Step	Data Type	Impact	Sub-Impact
3.1	**1.2**	Point	Alluvial Fan	NA
3.2	**1.6**	Point	Grade Control	Dam Ledge Waterfall Weir
NA	**3.3**	Point	Mass Failure	NA
5.5	**5.5**	Point	Dredging	Dredging

Table 2.1: Parameters collected with FIT.

Phase 1 Step	Phase 2 Step	Data Type	Impact	Sub-Impact
				Gravel Mining Commercial Mining
NA	**4.4**	Point	Debris Jam	NA
NA	**4.6**	Point	Stormwater Input	NA
NA	**4.9**	Point	Beaver Dam	NA
NA	**5.2**	Point	Migration	Neck Cut Off Flood chute Avulsion Braiding
NA	**5.3**	Point	Steep Riffle or Head Cut	Head Cut Steep Riffle
NA	**5.4**	Point	Stream Crossing	Stream Ford Animal Crossing
NA	**3.3**	Point	Gully	NA
6.2	**1.3**	Line	Development	NA
6.1	**1.3**	Line	Encroachment	Berm Improved Path Road Railroad
5.3	**3.1**	Line	Bank Armoring or Revetment	Rip-Rap Hard Bank Other
7.2	**3.1**	Line	Erosion	NA
5.4	**5.5**	Line	Straightening	Straightening With Windrowing

- **Phase 3**: Phase 3 surveys involve the collection of detailed, reach-scale survey data to verify or build upon Phase 2 data. These surveys are typically carried out prior to project development for an "active" channel management approach (e.g., floodplain restoration), or for long-term monitoring purposes.

2.2 Quality Assurance

The VTDEC Quality Assurance (QA) protocols outlined in the SGA protocols (VTDEC, 2009) were followed in order to ensure a complete and accurate dataset. FEA and VTDEC shared responsibility for QA for the SGAT shapefiles and the finalized Phase 1 datasets. All metadata describing the data sources were entered in the Data Management System (DMS), with extraordinary sources noted in the comments section in Phase 1 Step 5. The Phase 2 DMS database was finalized in January 2024. Comments from VTDEC for Phase 1 and Phase 2 QA were received in September 2024, and were addressed in the final DMS database edits, completed December 2024. All VTDEC comments and FEA responses are provided in Appendix C.

2.3 Bridge and Culvert Assessments

FEA conducted bridge and culvert surveys on all private and public structures within the Phase 2 study area. The Bridge and Culvert Assessment and Survey Protocols specified in Appendix G of the Vermont Stream Geomorphic Assessment Handbook (VTDEC, 2009) were followed. Latitude and Longitude of each structure was recorded in the field with a GPS unit or digitized based on aerial imagery. The assessment included various photographs documenting the condition of each structure.

2.4 Project Identification

Site-specific projects were identified using methods outlined by VTANR in Chapter 6 Preliminary Project Identification and Prioritization (VTANR, 2010). This planning guide is intended to aid in the development of projects that protect and restore river equilibrium conditions. The projects identified for the study reaches can be classified under one of the following categories: Active Geomorphic Restoration, Passive Geomorphic Restoration, and Conservation.

Active Geomorphic Restoration implies the management of rivers toward a state of geomorphic equilibrium through active, physical alteration of the channel and/or floodplain. Often this approach involves the removal of human constructed constraints or the construction of meanders, floodplains or stable banks. Riparian buffer re-vegetation and long-term protection of a river corridor is essential to this alternative.

Passive Geomorphic Restoration allows rivers to return toward a state of geomorphic equilibrium by removing factors adversely impacting the river and subsequently using the river's own energy and watershed inputs to re-establish its meanders, floodplains and equilibrium conditions. In many cases, passive restoration projects may require varying degrees of active measures to achieve ideal results. Riparian buffer re-vegetation and long-term protection of a river corridor (e.g., corridor easements) is essential to this alternative.

Conservation is an option to consider when stream conditions are generally "good", or "reference" and the channel is in a state of dynamic equilibrium. Typically, conservation is applied to minimally disturbed reaches where river structure and function and vegetation associations are relatively intact, and/or where high-quality aquatic habitat is found.

Infrastructure Resiliency are projects designed to reduce fluvial erosion and inundation hazards to adjacent municipal and private infrastructure. These projects typically prioritize infrastructure protection over channel stability and aquatic habitat.

3.0 Phase 1 Results

3.1 Results Summary

Phase 1 assessments were previously completed for the Phase 2 study area, for a total of 29 reaches covering 35.9 miles of surface waters within the West River watershed (Tables 3.1 and 3.2). Selected reaches were generally located in unconfined valleys and had B or C type channel geometry under reference conditions (Figure 3.1). FEA reviewed the available Phase 1 data in preparation for the Phase 2 assessments. The Phase 1 review identified channel straightening and buffer degradation as the primary geomorphic impacts within the study area (Figures 3.2 to 3.4.).

Table 3.1: Tributary and sub-tributary summary data

DMS ID	Name	Watershed Area (mi2)	Assessed River Length (miles)	Number of Assessed Reaches
R	West River	273	24.2	17
T11.08	Winhall River	20.3	1.3	1
T12.01	Thompsonburg Brook	9	2.5	4
T13.04	Flood Brook	7.7	0.6	1
T13.S2.01	Farnum Brook	2.1	1.7	1
T14.01	Utley Brook	27.5	5.2	4
T14.S3.01	Jones Brook	3.4	0.4	1

Drainage area includes all areas in the watershed draining to the lowest assessed reach

Table 3.2: Phase 1 data summary for reaches identified for Phase 2 assessment

Stream	Reach	Watershed Area (mi^2)	Channel Length (mi)	Channel Width (ft)	Channel Slope (%)	Sinuosity	Valley Type*	Reference Stream Type†	Bedform‡
West River	R10	273.0	2.0	154.6	0.4	1.06	BD	B	Riffle-Pool
	R11	264.6	1.1	152.5	0.57	1.07	BD	B	Riffle-Pool
	R12	228.8	0.5	143	0.04	1	BD	B	Riffle-Pool
	R13	214.1	2.9	138.9	0.85	1.02	BD	C	Riffle-Pool
	R18	100.9	2.0	99.7	0.46	1.01	SC	B	Riffle-Pool
	R19	88.1	2.6	94	0.53	1.14	BD	B	Riffle-Pool
	R20	70.0	1.1	85	0.5	1.01	SC	B	Riffle-Pool
	R21	68.4	0.6	84.1	0.88	1.01	BD	C	Riffle-Pool
	R22	40.6	1.0	66.9	0.44	1.33	VB	C	Riffle-Pool
	R23	39.3	1.0	65.9	0.2	1.11	BD	C	Riffle-Pool
	R24	37.9	1.5	64.9	0.08	1.61	VB	C	Riffle-Pool
	R25	32.9	2.8	60.9	0.71	1.11	VB	C	Riffle-Pool
	R26	26.4	0.3	55.3	1.63	1.17	VB	C	Riffle-Pool
	R27	22.7	0.5	51.7	0.52	1.02	VB	C	Riffle-Pool
	R28	22.1	1.7	51.2	0.82	1.24	VB	C	Riffle-Pool
	R29	9.2	0.7	34.8	1.52	1.06	VB	B	Step-Pool
	R30	7.6	1.9	31.9	1.54	1.12	VB	C	Riffle-Pool
Winhall River[Y]	T11.08	20.3	1.3	49.2	1.17	1.07	VB	C	Riffle-Pool
Thompsonburg Brook	T12.01	9.0	0.2	34.5	2.15	1.02	NW	B	Riffle-Pool
	T12.02	9.0	0.2	34.4	1.57	1	SC	B	Step-Pool
	T12.03	8.9	1.1	34.2	1.66	1.05	BD	C	Riffle-Pool
	T12.04	6.8	1.0	30.5	1.53	1.06	BD	C	Riffle-Pool
Flood Brook	T13.04	7.7	0.6	32.1	2.2	1.27	VB	C	Riffle-Pool
Farnum Brook	T13.S2.01	2.1	1.7	18.1	3.58	1.07	VB	B	Step-Pool
Utley Brook	T14.01	27.5	1.1	56.3	0.9	1.34	NW	C	Riffle-Pool
	T14.02	24.7	2.0	53.7	1.41	1.09	BD	C	Riffle-Pool
	T14.04	21.7	0.9	50.8	0.21	1.49	VB	C	Riffle-Pool
	T14.05	17.7	1.2	46.4	1.13	1.21	VB	C	Riffle-Pool
Jones Brook	T14.S3.01	3.4	0.4	22.5	2.14	1.36	VB	C	Riffle-Pool

* NC= Narrowly-confined; SC= Semi-confined; NW= Narrow; BD=Broad; VB=Very Broad

† per Rosgen (1994)

‡ per Montgomery and Buffington (1997)

Y T11.08 is a Phase 2 reassessment of a “sentinel site” reach

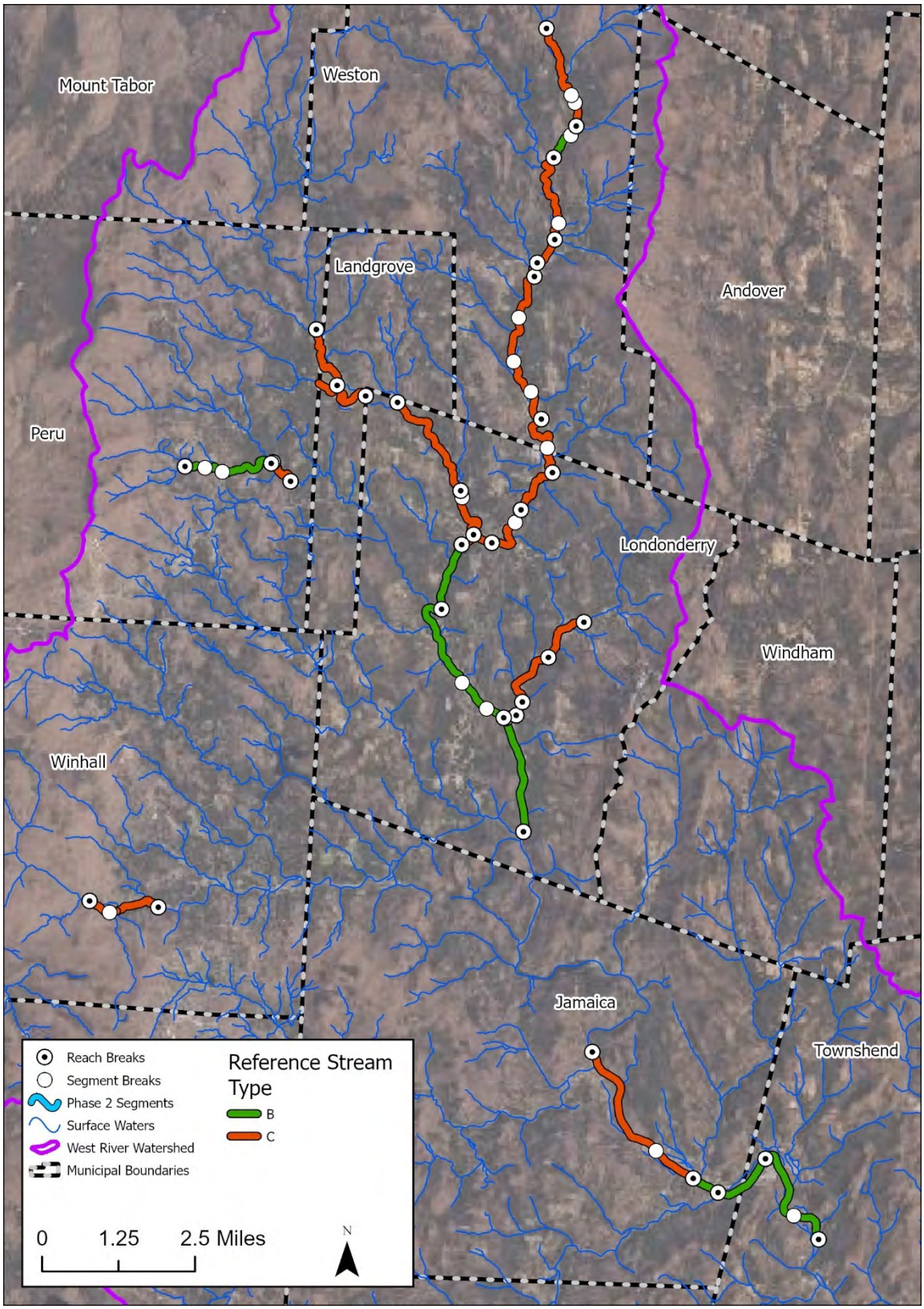


Figure 3.1: Reference stream types per Rosgen (1994) for the West River watershed.

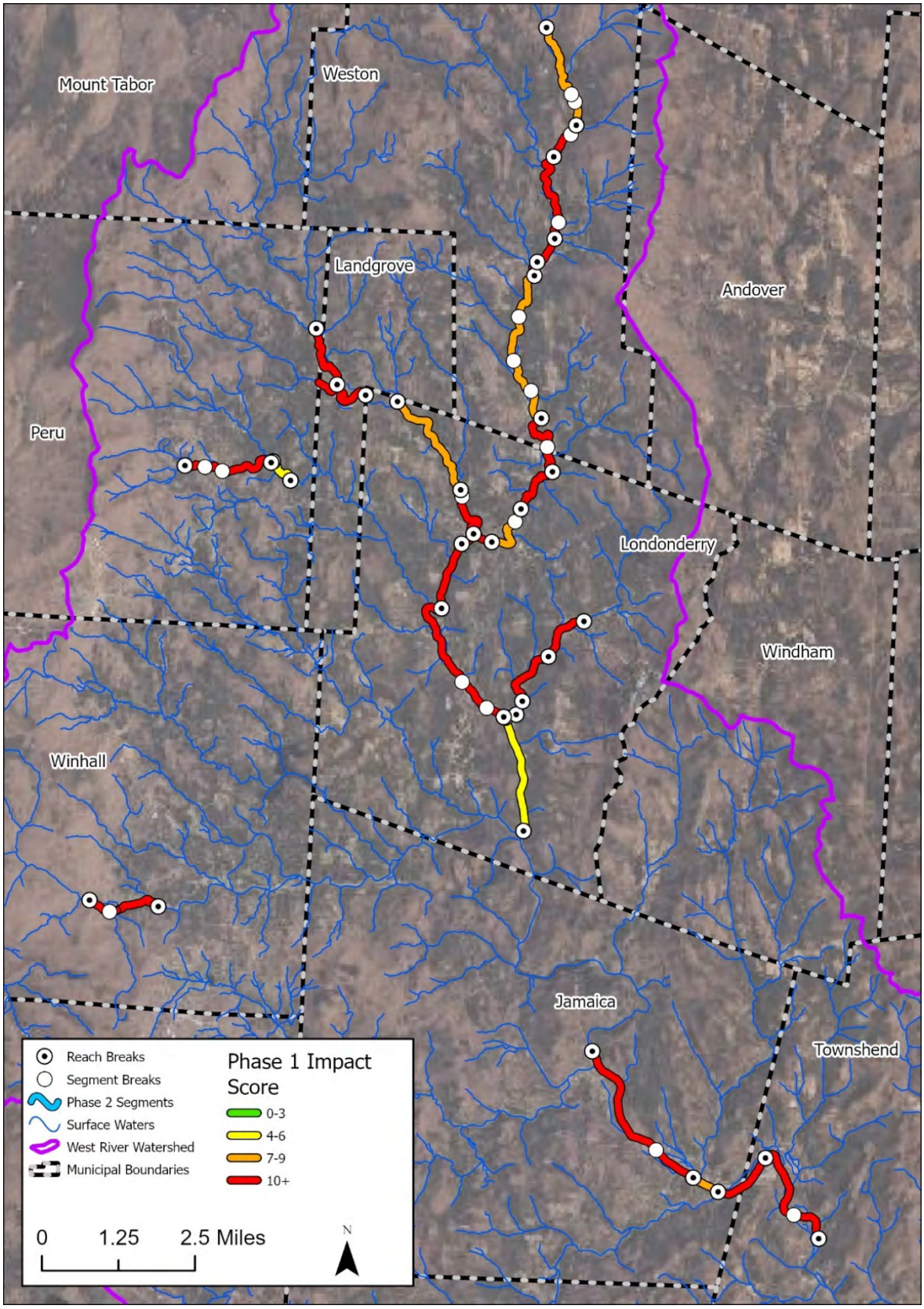


Figure 3.2: Phase 1 impact scores for the West River watershed.

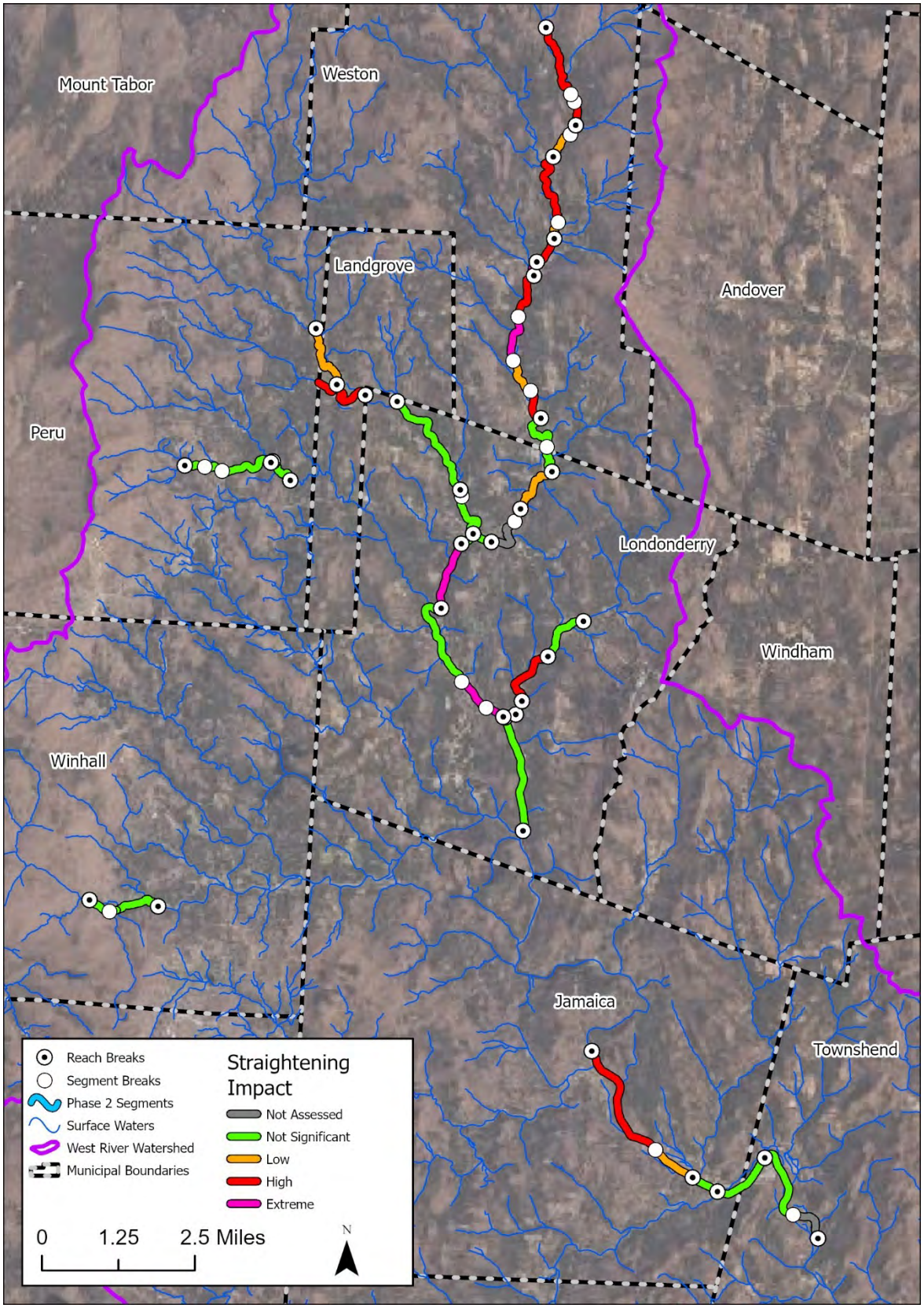


Figure 3.3: Straightening impacts for the West River watershed.

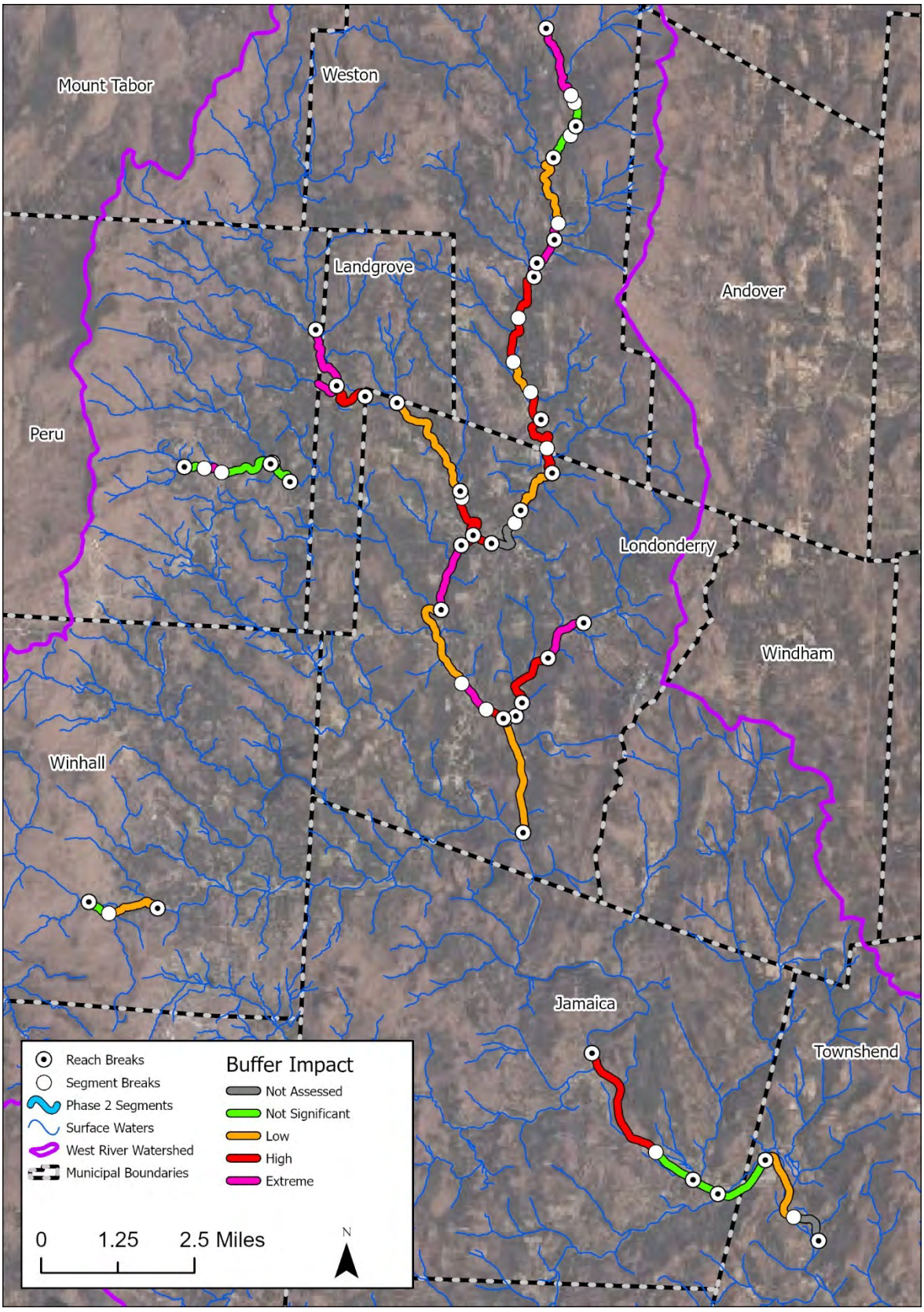


Figure 3.4: Buffer impacts for the West River watershed.

4.0 Phase 2 Results and River Corridor Planning

Phase 2 assessments were completed in July – November 2022. FEA sent landowner outreach letters that requested landowners to notify FEA if they did not grant access to their property for the SGA. We did not receive any responses denying access. Four (4) segments were not assessed due to anthropogenic (R10-A, R22-A) and beaver-created (R30-B, T14.01-B) dam impoundments. The assessed Phase II study reaches covered 42 reaches/segments totaling 34 miles. A summary of Phase 2 segmentation is provided in Table 4.1.

Table 4.1: Phase 2 segmentation

Reach	Number of Segments	Reason for Segmentation
R10	2	Impoundment from Townshend Dam
R13	2	Increasing encroachment impacts and a large side channel upstream (B)
R19	3	Continuous bedrock grade control (A), confined valley (B), unconfined and lower slope (C)
R22	2	Impoundment from dam
R24	2	Segment A has more active widening and planform adjustment
R25	4	Segment A is historically straightened, B has floodplain access with active widening, C is more stable and maintains floodplain access, D is deeply incised
R28	2	Channel width and planform adjustment increase going upstream (B)
R29	2	Majority of reach (A) is steeper and reference B type, short section upstream has lower slope and C type geometry (B)
R30	3	Large complex of beaver dams in the middle of the reach (B), increased incision upstream (C)
T11.08	2	Lower portion (A) has a highly active alluvial fan, upper portion (B) is more incised and steeper.
T13.S2.01	2	Slope and confinement decrease upstream (B)
T14.01	2	Large beaver dam complex impounds upstream portion (B)

4.1 Phase 2 Segment Summary Sheets

One-page summaries for each Phase 2 segment/reach are presented in this section. The impact summary section includes color-coded designations of Not Significant, **Low**, **High, or Extreme** levels of impact based on data collected during the Phase 2 assessments. Impact levels were assigned based on the longitudinal effect (<5% - Not Significant, 5-20% - Low, 20-50% - High, >50% - Extreme), and the overall impact of discrete features on the reach/segment (constrictions, stormwater inputs, steep riffles, etc.).

Incision Ratio and Entrenchment Ratios are important indicators of the degree of stream departure from reference condition. Incision ratio describes the degree of floodplain accessibility: values close to 1.0 represent reference conditions with an accessible floodplain, values greater than 2.0 indicate an extreme disconnection of floodplain typically associated with a stream type departure. Entrenchment ratio

describes the width of the flood prone area in relation to the bankfull channel width. Reference entrenchment ratios vary with stream type and valley setting. Stream impacts such as encroachment, incision, widening, and straightening may all lower the entrenchment ratio. C-type streams typically have entrenchment ratios greater than 2.0 and values below 2.0 or 1.4 represent stream type departures to B or F-type respectively. Definitions for technical terminology within the summary sheets are provided in the Glossary of Terms in Section 8.0.

Habitat assessment rankings for large woody debris and pool counts (measured in reference to predicted bankfull width - wbkf) are defined in Table 4.2.

Table 4.2: LWD and Pool Ranking for RHA.

Rank	LWD		Pool	
	Diameter (ft)	**Length (relative to wbkf)**	**Depth (ft)**	**Length/Width (relative to wbkf)**
1	0.5≤D<1.0	<0.5	1.0≤D<2.0	<0.5
2	0.5≤D<1.0	≥0.5	1.0≤D<2.0	≥0.5
3	1.0≤D<2.0	<0.5	2.0≤D<3.0	<0.5
4	1.0≤D<2.0	≥0.5	2.0≤D<3.0	≥0.5
5	D≥2.0	<0.5	D≥3.0	<0.5
6	D≥2.0	≥0.5	D≥3.0	≥0.5
7	--	--	D≥3.0	≥1.0

4.1.1 West River Lower Mainstem - Phase 2 Assessment Summary

The Phase 2 assessed reaches/segments on the West River mainstem in the towns of Jamaica and Townshend are described below (Figure 4.1).

- Reach R10
  - Reach begins just upstream of the Townshend Dam and continues upstream to a sharp bend in the river upstream of the Tannery Brook confluence. Segment A was not assessed due to being impounded by the Townshend Dam. Segment B is historically incised and is likely tail-watered by the Townshend Dam at high flows.
- Reach R11
  - Reach begins at a sharp bend in the river and continues upstream to the Wardsboro Brook confluence. The reach is historically incised and receives high sediment inputs from Wardsboro Brook.
- Reach R12
  - Reach is short, beginning just upstream of the Wardsboro Brook confluence and continues upstream to the Turkey Mountain Brook confluence. The reach is historically incised with minimal erosion and migration.
- Reach R13
  - Reach begins upstream of the Turkey Mountain Brook confluence and continues upstream to just upstream of the Ball Mountain Brook confluence. Segment A is wide and shallow while the Segment B is moderately incised with minimal widening.

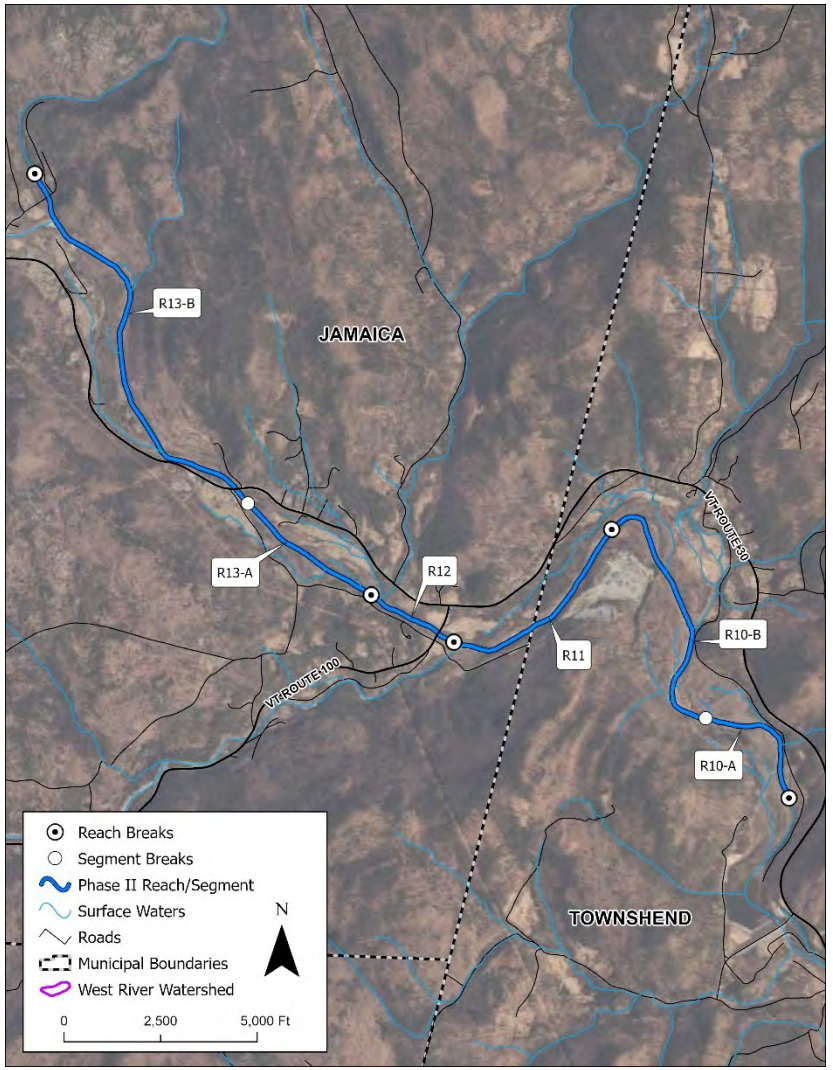


Figure 4.1: West River lower mainstem reach and segment locations.

Stream: West River **Reach/Segt:** R10-B **Town:** Townshend **Date Assessed**: 8/15/2022

Channel Length (ft): 7,302 **Channel Slope (%):** 0.40 **Sinuosity:** 1.06 **Watershed Area (mi²):** 272.95

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Cobble
Stream Type	B	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	154.6
Bankfull Width (ft)	156
Max Depth (ft)	4.5
Width/Depth Ratio	46.3
Entrenchment Ratio	1.1
Incision Ratio	2.4

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	10	4
2	0	0
3	4	1
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	11	4

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	46/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	39/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	F/III
Stream Type Departure	B to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The reach is historically incised and shows evidence of significant active aggradation and widening. Segment is likely tail-watered by Townshend dam at high flows. There are high sediment inputs from Wardsboro Brook upstream.



Looking downstream from the cross-section location



Erosion on steep banks

Stream: West River **Reach/Segt:** R11 **Town:** Jamaica & Townshend **Date Assessed**: 8/15/2022

Channel Length (ft): 5,570 **Channel Slope (%):** 0.57 **Sinuosity:** 1.07 **Watershed Area (mi²):** 264.56

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Gravel
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	152.5
Bankfull Width (ft)	189
Max Depth (ft)	4.2
Width/Depth Ratio	103.3
Entrenchment Ratio	1.3
Incision Ratio	1.9

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	11	0
2	0	0
3	3	1
4	0	0
5	1	0
6	0	0
7	-	0
#/mile	14	1

Number of Debris Jams: 1

Step 6/7 Summary

RHA Score/Condition	52/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	39/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The reach is historically incised and is actively aggrading and widening. There are major inputs of coarse sediment from Wardsboro Brook leading to increased deposition throughout the reach and a large delta bar at the confluence.



Delta bar at the mouth of Wardsboro Brook.



Mass failure along bank.

Stream: West River **Reach/Segt:** R12 **Town:** Jamaica **Date Assessed**: 8/16/2022

Channel Length (ft): 2,498 **Channel Slope (%):** 0.04 **Sinuosity:** 1.00 **Watershed Area (mi²):** 228.75

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Narrow
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Cobble
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	143.0
Bankfull Width (ft)	156
Max Depth (ft)	3.0
Width/Depth Ratio	69.6
Entrenchment Ratio	1.4
Incision Ratio	1.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Route 100S	192	None

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	1
2	0	0
3	0	0
4	0	1
5	0	0
6	0	1
7	-	0
#/mile	2	6

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	48/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	41/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The reach is historically incised with evidence of active aggradation from numerous large bar deposits of cobble material. Minimal erosion or migration indicates that the reach is aggrading but not actively widening.



Mid-channel bar.



Looking downstream from the Route 100S bridge.

Stream: West River **Reach/Segt:** R13-A **Town:** Jamaica **Date Assessed**: 8/16/2022

Channel Length (ft): 4,014 **Channel Slope (%):** 0.85 **Sinuosity:** 1.02 **Watershed Area (mi²):** 214.11

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	138.9
Bankfull Width (ft)	117
Max Depth (ft)	3.5
Width/Depth Ratio	43.3
Entrenchment Ratio	6.8
Incision Ratio	1.4

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	0
2	1	0
3	1	0
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	4	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	50/Fair-Good
Habitat Type Departure	Plane Bed
RGA Score / Condition	45/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The channel is wide and shallow with signs of active aggradation and some widening. There is a large flood chute from the Ball Mountain Brook delta to just upstream of the manufactured housing units along Route 100. This may account for the reduced main channel width in segment B. From the manufactured housing units to the downstream end of the segment there is encroachment and extensive bank stabilization. There are high sediment loads from Ball Mountain Brook and a large delta bar at the confluence.



Large flood chute.



Looking downstream from the cross-section location.

Stream: West River **Reach/Segt:** R13-B **Town:** Jamaica **Date Assessed**: 8/16/2022

Channel Length (ft): 11,243 **Channel Slope (%):** 0.85 **Sinuosity:** 1.02 **Watershed Area (mi²):** 214.11

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	138.9
Bankfull Width (ft)	91
Max Depth (ft)	3.6
Width/Depth Ratio	36.0
Entrenchment Ratio	2.9
Incision Ratio	1.6

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Route 30	142	None
Br	Depot St	110	None

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	12	1
2	0	0
3	11	1
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	11	1

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	51/Fair-Good
Habitat Type Departure	Plane Bed
RGA Score / Condition	46/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-1:** Passive Restoration – Conservation

Reach Highlights: Channel is moderately incised (historic) with active aggradation and limited evidence of widening.



Delta bar at the confluence with Ball Mountain Brook.



Extensive bank armoring near manufactured housing units.

4.1.2 West River Central Mainstem - Phase 2 Assessment Summary

The Phase 2 assessed reaches/segments on the West River mainstem south of its confluence with Utley Brook and north of its confluence with the Winhall River are described below (Figure 4.2).

- Reach R18
  - Reach begins upstream of the Winhall River (Trib 11) confluence and continues upstream to the Thompsonburg Brook (Trib 12) confluence. The reach is very straight with vert limited floodplain access.
- Reach R19
  - Reach begins just upstream of the Thompsonburg Brook confluence and continues upstream through the South Londonderry village center to just upstream of the Flood Brook (Trib 13) confluence. Segment A is historically straightened and deeply incised. Segment B is pinned between two roads with no opportunity for widening or planform adjustment. Segment C is widening and aggrading coarse sediment.
- Reach R20
  - Reach begins just upstream of the Flood Brook confluence and continues upstream to just south of the Londonderry Village Market. The reach is extensively straightened along Route 100 and pinned against the left valley wall.
- Reach R21
  - Reach begins just south of the Londonderry Village Market and continues upstream through the Londonderry village center to the Vermont Route 11 bridge. Utley Brook (Trib 14) confluence is located in the middle of the reach. The channel is encroached by development along most of the right bank. The dam upstream interrupts sediment transport and is likely contributing to incision.

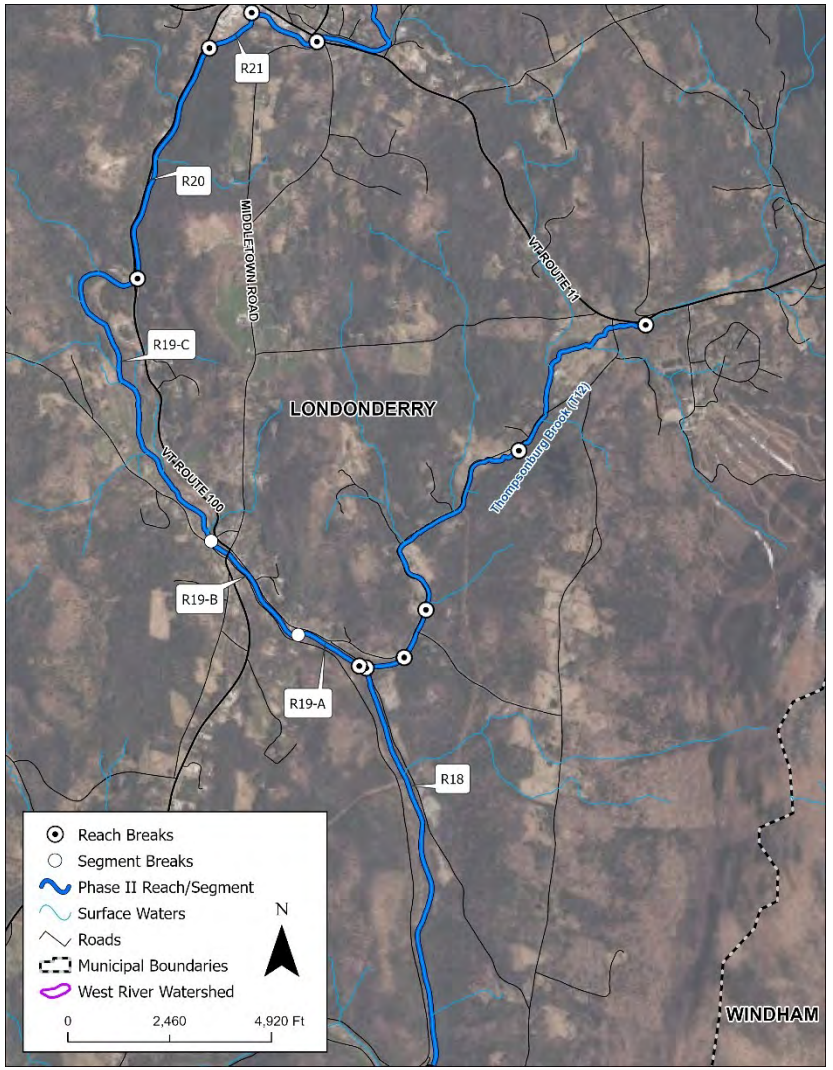


Figure 4.2: West River central mainstem reach and segment locations.

Stream: West River **Reach/Segt:** R18 **Town:** Londonderry **Date Assessed**: 9/22/2022

Channel Length (ft): 10,348 **Channel Slope (%):** 0.46 **Sinuosity:** 1.01 **Watershed Area (mi²):** 100.86

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Semi-confined	Semi-confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Cobble
Stream Type	B	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	99.7
Bankfull Width (ft)	112
Max Depth (ft)	4.0
Width/Depth Ratio	37.8
Entrenchment Ratio	1.2
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	5	0
2	0	0
3	4	0
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	5	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	50/Fair-Good
Habitat Type Departure	Plane Bed
RGA Score / Condition	46/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	B to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-2:** Passive Restoration – Corridor Easement
- **WR-3:** Active Restoration – Stormwater Management

Reach Highlights: The reach is very straight, potentially naturally so, and has very limited access to narrow floodplain benches. Coarse substrate and potentially some underlying grade control limit future incision. The channel has limited space to adjust planform or aggrade.



Very straight channel.



Erosion on left bank. Narrow floodplain bench is visible.

Stream: West River **Reach/Segt:** R19-A **Town:** Londonderry **Date Assessed**: 8/8/2022

Channel Length (ft): 1,710 **Channel Slope (%):** 0.53 **Sinuosity:** 1.14 **Watershed Area (mi²):** 88.08

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Semi-confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Boulder
Stream Type	B	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	94.0
Bankfull Width (ft)	117
Max Depth (ft)	3.2
Width/Depth Ratio	49.4
Entrenchment Ratio	1.1
Incision Ratio	2.2

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	2	2
2	0	0
3	0	0
4	0	0
5	0	0
6	0	1
7	-	1
#/mile	6	12

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	43/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	35/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	B to F
Stream Sensitivity	High

Impact Summary

Bank Erosion	**Stormwater**
Armoring	**Constrictions**
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-4:** Active Restoration – Stormwater Management

Reach Highlights: The reach is historically straightened and is deeply incised and entrenched due to the elevated roadway on the left bank. Bedrock grade controls were observed through most of the reach; there is no opportunity for further incision or widening.



Horse pasture with manure draining to ditch.



Bedrock grade control.

Stream: West River **Reach/Segt:** R19-B **Town:** Londonderry **Date Assessed**: 8/8/2022

Channel Length (ft): 3,205 **Channel Slope (%):** 0.53 **Sinuosity:** 1.14 **Watershed Area (mi²):** 88.08

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Narrowly confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Bedrock
Stream Type	B	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	94.0
Bankfull Width (ft)	81
Max Depth (ft)	4.9
Width/Depth Ratio	23.2
Entrenchment Ratio	1.2
Incision Ratio	3.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Route 100	133	None

# of Other Constrictions: 0
# of Grade Controls: 2
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	0	0
2	0	1
3	0	1
4	0	1
5	0	0
6	0	0
7	-	0
#/mile	0	5

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	31/Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	44/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	B to F
Stream Sensitivity	High

Impact Summary

Bank Erosion	**Stormwater**
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-5:** Active Restoration – Stormwater Management
- **WR-6:** Passive Restoration – Floodplain Restoration

Reach Highlights: The reach is pinned between two roads with elevated fill along both banks. No opportunity for widening or planform adjustment and limited opportunity for additional incision due to grade control.



Looking downstream from the Route 100 bridge at river pinned between two roads.



Pool and grade control.

Stream: West River **Reach/Segt:** R19-C **Town:** Londonderry **Date Assessed**: 8/8/2022

Channel Length (ft): 9,046 **Channel Slope (%):** 0.53 **Sinuosity:** 1.14 **Watershed Area (mi²):** 88.08

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	94.0
Bankfull Width (ft)	91
Max Depth (ft)	3.4
Width/Depth Ratio	36.5
Entrenchment Ratio	2.0
Incision Ratio	1.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Route 100	149	None

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	7	0
2	1	2
3	2	0
4	2	0
5	2	0
6	0	0
7	-	0
#/mile	8	1

Number of Debris Jams: 1

Step 6/7 Summary

RHA Score/Condition	59/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	50/Fair-Good
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	B to C
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-7:** Passive Restoration – Corridor Easement
- **WR-8:** Passive Restoration – Corridor Easement

Reach Highlights: Large cobble bars were observed throughout the segment along with numerous areas of erosion indicating that the reach is widening and aggrading coarse sediment.



Mass failure.



Large mid-channel cobble bar.

Stream: West River **Reach/Segt:** R20 **Town:** Londonderry **Date Assessed**: 8/9/2022

Channel Length (ft): 6,024 **Channel Slope (%):** 0.50 **Sinuosity:** 1.01 **Watershed Area (mi²):** 70.0

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Semi-confined	Narrowly-confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Cobble
Stream Type	B	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	85.0
Bankfull Width (ft)	91
Max Depth (ft)	4.0
Width/Depth Ratio	35.7
Entrenchment Ratio	1.2
Incision Ratio	2.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	0	0
2	0	0
3	2	0
4	0	1
5	0	0
6	0	1
7	-	1
#/mile	2	3

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	41/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	34/Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	B to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	**Headcut**

Potential Projects in Reach

- **WR-9:** Active Restoration – Bank Stabilization

Reach Highlights: The reach is extensively straightened along Route 100 and is pinned against the left valley wall. Historically the reach likely had some sinuosity and small flood benches. The reach is stuck in Stage II with no opportunity for widening or planform adjustment. Incision is unlikely due to coarse bed material.



Armored bank along Route 100.



Unarmored portion of reach.

Stream: West River **Reach/Segt:** R21 **Town:** Londonderry **Date Assessed**: 8/9/2022

Channel Length (ft): 3,191 **Channel Slope (%):** 0.88 **Sinuosity:** 1.01 **Watershed Area (mi²):** 68.37

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Narrow
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	84.1
Bankfull Width (ft)	83
Max Depth (ft)	4.1
Width/Depth Ratio	29.0
Entrenchment Ratio	2.1
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 2
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	0	0
2	0	0
3	2	0
4	0	1
5	0	0
6	0	1
7	-	0
#/mile	3	3

Number of Debris Jams: 1

Step 6/7 Summary

RHA Score/Condition	41/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	36/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	Deposition
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-10:** Active Restoration – Floodplain Restoration and Wastewater
- **WR-11:** Active Restoration – Floodplain Restoration
- **WR-12:** Passive Restoration – Buffer Planting
- **WR-13:** Active Restoration – Road Drainage

Reach Highlights: Channel is pinned against the left valley wall for most of the length and is encroached by development along most of the right bank, leading to a change in valley confinement. The channel is incised and the right floodplain is fully developed. Upstream dam is interrupting sediment transport and likely contributing to incision. The reach is stuck in Stage II.



Typical encroachment along reach.



Looking upstream.

4.1.3 West River Upper Mainstem - Phase 2 Assessment Summary

The Phase 2 assessed reaches/segments on the West River north of its confluence with Utley Brook are described below (Figure 4.3).

- Reach R22
  - Reach begins at the Vermont Route 11 bridge in the Londonderry village center and continues upstream to just south of the intersection of VT Route 100 and Evergreen Lane. Segment A was not assessed due to impoundment above the Londonderry dam. Segment B is encroached upon by VT Route 100 and is incised with no floodplain access.
- Reach R23
  - Reach begins south of the intersection of VT Route 100 and Evergreen Lane and continues upstream to just downstream of a section of the river with extensive meanders. The reach is incised with signs of active widening and planform adjustment.
- Reach R24
  - Reach begins just downstream of a section of the river with extensive meanders and continues upstream to a bridge on VT Route 100. Segment A has several areas of ongoing channel migration, widening, and aggradation. Segment B is moderately incised with floodplain access and limited areas of active widening due to historic bank armoring.
- Reach R25
  - Reach begins at a bridge on VT Route 100 and continuing upstream to the Weston village center. Segment A is incised, likely as a result of historic straightening. Segment B is overwidened with many large mid channel and diagonal bars and limited bank erosion. Segment C is historically straightened and pinned against the right valley wall. Segment D is historically straightened and deeply incised.
- Reach R26
  - Reach is short, flowing through the core of the Weston Village Center. The entire reach is straightened and deeply incised with extensive bank armoring. The sediment regime is affected by the large upstream dam.
- Reach R27
  - Reach begins in the Weston village center immediately downstream of the dam and continues upstream to downstream of a confluence with an unnamed tributary that parallels Chester Mountain Road. The majority of the reach is backwatered by a historic dam.

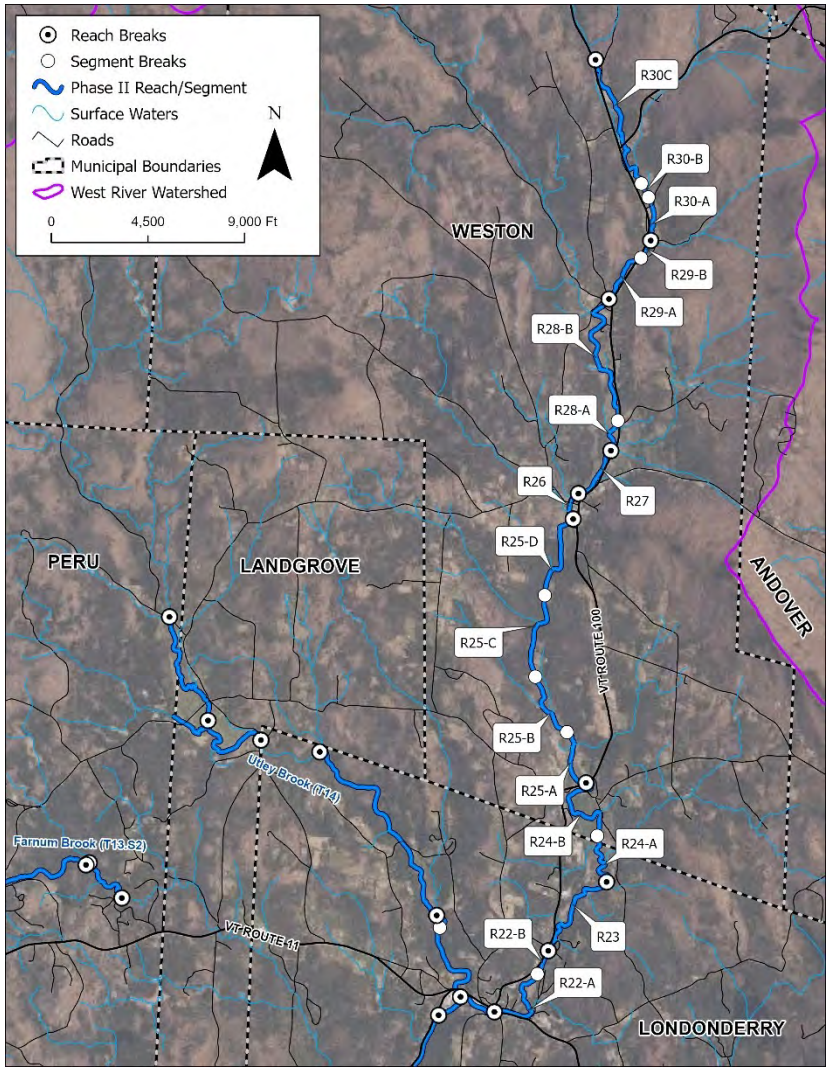


Figure 4.3: West River upper mainstem reach and segment locations.

- Reach R28
    - Reach begins just downstream of a confluence with an unnamed tributary that parallels Chester Mountain Road and continues upstream to just upstream of the Greendale Road bridge. Segment A is narrow with signs of active aggradation. Segment B is actively widening and aggrading with many large depositional features and undercut banks.
- Reach R29
    - Reach begins just upstream of the Greendale Road bridge and continues upstream to just upstream of the confluence with an unnamed tributary that parallels Felton Road. The lower portion of Segment A is stable while the middle and upper portions are actively aggrading. Segment B is significantly impacted by historic straightening and encroachment.
- Reach R30
    - Reach begins upstream of the confluence with an unnamed tributary that parallels Felton Road and continues upstream to the midpoint between the Ettinger Road bridge and the confluence with an unnamed tributary that parallels Shattuck Road. Segment A is moderately incised, likely due to historic straightening. Segment B was not assessed due to impoundment from a large complex of beaver dams. Segment C has been subject to extensive historical straightening and has moderate to severe incision.

Stream: West River **Reach/Segt:** R22-B **Town:** Londonderry **Date Assessed**: 10/19/2022

Channel Length (ft): 1,210 **Channel Slope (%):** 0.44 **Sinuosity:** 1.33 **Watershed Area (mi²):** 40.64

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Semi-confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Gravel
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	66.9
Bankfull Width (ft)	55
Max Depth (ft)	3.4
Width/Depth Ratio	22.0
Entrenchment Ratio	1.4
Incision Ratio	2.1

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	3	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	13	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	38/Fair-Poor
Habitat Type Departure	No Departure
RGA Score / Condition	43/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: Route 100 is a major encroachment on the channel and has pinned the river against the left valley wall. The channel is incised with no floodplain access due to Route 100. The channel has no opportunity for widening or planform and therefore is stuck in stage II. The downstream dam affects sediment transport and has reduced the channel slope.



Looking upstream at Route 100 encroachment.



Looking downstream at Route 100 encroachment.

Stream: West River **Reach/Segt:** R23 **Town:** Londonderry **Date Assessed**: 10/20/2022

Channel Length (ft): 5,084 **Channel Slope (%):** 0.20 **Sinuosity:** 1.11 **Watershed Area (mi²):** 39.34

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	65.9
Bankfull Width (ft)	71
Max Depth (ft)	3.5
Width/Depth Ratio	26.3
Entrenchment Ratio	1.1
Incision Ratio	2.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Cobble Hill Rd	55	None

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	3	2
2	2	0
3	2	1
4	4	2
5	0	0
6	1	1
7	-	2
#/mile	12	8

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	51/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	41/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	**Gully Erosion**
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-15:** Active Restoration – Road Drainage
- **WR-16:** Passive Restoration – Corridor Easement

Reach Highlights: Channel is incised with signs of active widening and planform adjustment as increased sediment (gravel) works through the reach.



Looking upstream at the incised channel.



Small mass failure.

Stream: West River **Reach/Segt:** R24-A **Town:** Londonderry & Weston **Date Assessed**: 10/20/2022

Channel Length (ft): 3,039 **Channel Slope (%):** 0.08 **Sinuosity:** 1.61 **Watershed Area (mi²):** 37.94

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	64.9
Bankfull Width (ft)	64
Max Depth (ft)	3.0
Width/Depth Ratio	39.5
Entrenchment Ratio	2.2
Incision Ratio	1.7

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 1

Rapid Habitat Assessment

Rank	LWD	Pools
1	4	0
2	2	3
3	1	2
4	2	0
5	0	0
6	0	0
7	-	2
#/mile	16	12

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	51/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	40/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-17:** Active Restoration – Utility
- **WR-18:** Passive Restoration – Buffer Planting and Corridor Easement
- **WR-19:** Passive Restoration – Buffer Planting and Corridor Easement

Reach Highlights: Channel has active widening, aggradation, and planform adjustment processes. The floodplain is elevated but incision is generally <2. Review of historic imagery shows several areas of migration, which is ongoing.



Beaver dam.



Erosion and buffer less than 50'.

Stream: West River **Reach/Segt:** R24-B **Town:** Londonderry & Weston **Date Assessed**: 10/20/2022

Channel Length (ft): 4,394 **Channel Slope (%):** 0.08 **Sinuosity:** 1.61 **Watershed Area (mi^2):** 37.94

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	64.9
Bankfull Width (ft)	81
Max Depth (ft)	3.0
Width/Depth Ratio	50.7
Entrenchment Ratio	13.6
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Route 100	154	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	2	0
2	5	0
3	2	0
4	1	1
5	0	1
6	0	0
7	-	2
#/mile	12	5

Number of Debris Jams: 2

Step 6/7 Summary

RHA Score/Condition	44/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	47/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-20:** Active Restoration – Channel Restoration

Reach Highlights: The segment is moderately incised with a large floodplain available on one or both banks throughout. We did not observe many areas of active widening, partially slowed by historic bank armoring. The channel had increased sediment load with numerous mid channel bars and partially filled riffles. We assessed the reach as early stage III with aggradation being the dominant process.



Looking upstream at the Route 100 bridge.



Bank armoring and erosion.

Stream: West River **Reach/Segt:** R25-A **Town:** Weston **Date Assessed**: 9/23/2022

Channel Length (ft): 2,935 **Channel Slope (%):** 0.71 **Sinuosity:** 1.11 **Watershed Area (mi²):** 32.85

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	60.9
Bankfull Width (ft)	68
Max Depth (ft)	3.2
Width/Depth Ratio	31.6
Entrenchment Ratio	1.3
Incision Ratio	2.2

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	4	1
2	2	0
3	4	0
4	2	0
5	0	0
6	0	0
7	-	0
#/mile	22	2

Number of Debris Jams: 1

Step 6/7 Summary

RHA Score/Condition	51/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	47/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	Deposition
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-21** Active Restoration – Buffer Planting and Corridor Easement

Reach Highlights: The reach is incised leading to a departure to F type. Incision is likely due to historic straightening. Minimal evidence of widening or aggradation.



Agricultural ford crossing.



Looking downstream at incised channel.

Stream: West River **Reach/Segt:** R25-B **Town:** Weston **Date Assessed**: 9/23/2022

Channel Length (ft): 3,321 **Channel Slope (%):** 0.71 **Sinuosity:** 1.11 **Watershed Area (mi²):** 32.85

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	60.9
Bankfull Width (ft)	200
Max Depth (ft)	3.6
Width/Depth Ratio	190.2
Entrenchment Ratio	3.0
Incision Ratio	1.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	8	1
2	2	0
3	6	1
4	2	0
5	0	0
6	0	0
7	-	0
#/mile	29	3

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	51/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	52/Fair-Good
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: Aggradation is the dominant process within this segment. The channel is overwidened in many places with large mid channel and diagonal bars. Active bank erosion is limited, suggesting that the channel is not actively adjusting planform.



Steep riffle and woody debris.



Middle bar at confluence with tributary.

Stream: West River **Reach/Segt:** R25-C **Town:** Weston **Date Assessed**: 9/23/2022

Channel Length (ft): 4,221 **Channel Slope (%):** 0.71 **Sinuosity:** 1.11 **Watershed Area (mi²):** 32.85

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	60.9
Bankfull Width (ft)	97
Max Depth (ft)	3.8
Width/Depth Ratio	46.3
Entrenchment Ratio	4.1
Incision Ratio	1.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	2	0
2	3	0
3	2	0
4	5	0
5	0	0
6	0	0
7	-	0
#/mile	15	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	50/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	49/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The channel was historically straightened and is pinned against the right valley wall. Large unvegetated side bars were observed through most of the segment suggesting that aggradation is the dominant process. We observed some areas of erosion, but the widened channel appears to be historic and not actively widening.



Looking upstream at minimally vegetated side bars.



Mowing at top of bank.

Stream: West River **Reach/Segt:** R25-D **Town:** Weston **Date Assessed**: 9/23/2022

Channel Length (ft): 4,360 **Channel Slope (%):** 0.71 **Sinuosity:** 1.11 **Watershed Area (mi²):** 32.85

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	60.9
Bankfull Width (ft)	61
Max Depth (ft)	3.4
Width/Depth Ratio	27.3
Entrenchment Ratio	1.2
Incision Ratio	2.5

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	2	0
2	1	0
3	2	0
4	3	0
5	0	0
6	0	0
7	-	0
#/mile	10	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	45/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	47/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	**Gully Erosion**
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The segment is historically straightened and is deeply incised. Incision is the dominant process. However, we did observe formation of large side bars suggesting that aggradation may be starting.



Armoring and no buffer.



Large side bar.

Stream: West River **Reach/Segt:** R26 **Town:** Weston **Date Assessed**: 10/20/2022

Channel Length (ft): 1,412 **Channel Slope (%):** 1.63 **Sinuosity:** 1.17 **Watershed Area (mi²):** 26.35

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Semi-confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Boulder
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	55.3
Bankfull Width (ft)	41
Max Depth (ft)	3.8
Width/Depth Ratio	14.2
Entrenchment Ratio	1.2
Incision Ratio	3.2

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Lawrence Hill Road	80	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
#/mile	3	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	25/Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	29/Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-22:** Passive Restoration – Buffer Planting
- **WR-23:** Active Restoration – IDDE

Reach Highlights: The entire reach is straightened and deeply incised with extensive bank armoring. The sediment regime is strongly affected by the large upstream dam. The reach is stuck in Stage II with no chance of adjustment.



Looking downstream from the bridge at the straightened and extensively armored channel.



Stormwater input directly into channel.

Stream: West River **Reach/Segt:** R27 **Town:** Weston **Date Assessed**: 7/28/2022

Channel Length (ft): 2,698 **Channel Slope (%):** 0.52 **Sinuosity:** 1.02 **Watershed Area (mi²):** 22.67

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Gravel
Stream Type	C	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	51.7
Bankfull Width (ft)	74
Max Depth (ft)	4.2
Width/Depth Ratio	23.2
Entrenchment Ratio	1.9
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Private	66	None

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	0
2	0	0
3	0	0
4	1	0
5	0	1
6	0	0
7	-	0
#/mile	4	2

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	28/Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	44/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	C to B
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-24:** Active Restoration – Floodplain Restoration
- **WR-25:** Active Restoration – Bank Stabilization

Reach Highlights: The majority of the reach is backwatered by the historic dam. The upper portion of the reach shows signs of aggradation of gravel. An elevated but accessible floodplain is located through most of the reach. Incision has caused a departure from C to Bc.



Reach backwatered by dam.



Elevated floodplain with bank erosion.

Stream: West River **Reach/Segt:** R28-A **Town:** Weston **Date Assessed**: 7/28/2022

Channel Length (ft): 1,634 **Channel Slope (%):** 0.82 **Sinuosity:** 1.24 **Watershed Area (mi²):** 22.14

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	51.2
Bankfull Width (ft)	32
Max Depth (ft)	3.5
Width/Depth Ratio	12.7
Entrenchment Ratio	3.1
Incision Ratio	1.7

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	3	0
2	0	0
3	0	3
4	0	2
5	0	0
6	0	0
7	-	0
#/mile	10	16

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	40/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	54/Fair-Good
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-26:** Active Restoration – Bank Stabilization
- **WR-27:** Active Restoration – Stormwater Management
- **WR-28:** Active Restoration – Corridor Easement

Reach Highlights: The segment typically has a narrower channel with signs of active aggradation. Small areas of erosion and bank armor were observed but active widening is minimal.



Ford crossing.



Bank erosion.

Stream: West River **Reach/Segt:** R28-B **Town:** Weston **Date Assessed**: 7/28/2022

Channel Length (ft): 7,377 **Channel Slope (%):** 0.82 **Sinuosity:** 1.24 **Watershed Area (mi²):** 22.14

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	51.2
Bankfull Width (ft)	86
Max Depth (ft)	3.3
Width/Depth Ratio	48.1
Entrenchment Ratio	3.5
Incision Ratio	1.7

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	TH 19	117	None
Br	Greendale Rd	117	None

# of Other Constrictions: 0
# of Grade Controls: 7
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	6	2
2	4	1
3	5	3
4	4	3
5	2	1
6	1	3
7	-	0
#/mile	16	9

Number of Debris Jams: 4

Step 6/7 Summary

RHA Score/Condition	48/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	43/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater Constrictions
Armoring	**Deposition**
Riparian Buffer	**Migration**
Encroachment	**Steep Riffle**
Development	Gully Erosion
Corridor Land Use	**Straightening**
Mass Failure	Headcut
Flow Regulation	

Potential Projects in Reach

- **WR-29:** Passive Restoration – Buffer Planting

Reach Highlights: The channel is actively widening and aggrading with many large depositional features and undercut banks. We assessed the reach as late stage III progressing towards planform adjustment.



Looking upstream at the Greendale Road bridge.



Stacked stone wall and encroachment.

Stream: West River **Reach/Segt:** R29-A **Town:** Weston **Date Assessed**: 10/21/2022

Channel Length (ft): 2,673 **Channel Slope (%):** 1.52 **Sinuosity:** 1.06 **Watershed Area (mi²):** 9.23

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Semi-confined
Bedform	Step-Pool	Step-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	34.8
Bankfull Width (ft)	33
Max Depth (ft)	2.5
Width/Depth Ratio	17.1
Entrenchment Ratio	1.7
Incision Ratio	2.2

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 2
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	6	0
2	5	1
3	1	2
4	0	0
5	1	0
6	1	0
7	-	0
#/mile	28	6

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	60/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	61/Fair-Good
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

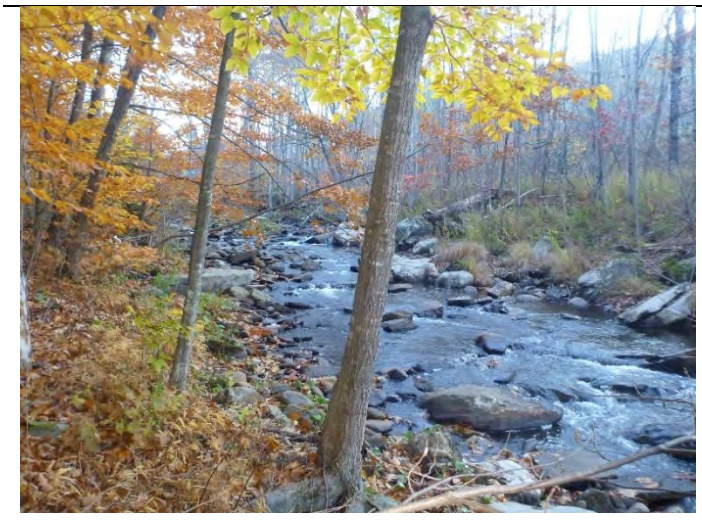
Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-30:** Passive Restoration – Corridor Easement

Reach Highlights: The lower portion of the segment is stable with well-formed steps. The middle and upper portions have large depositional features and indicate that aggradation is active.



Stable area with well-formed steps.



Armoring and deposition on right bank.

Stream: West River **Reach/Segt:** R29-B **Town:** Weston **Date Assessed**: 10/21/2022

Channel Length (ft): 946 **Channel Slope (%):** 1.52 **Sinuosity:** 1.06 **Watershed Area (mi²):** 9.23

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Step-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	34.8
Bankfull Width (ft)	35
Max Depth (ft)	2.7
Width/Depth Ratio	19.7
Entrenchment Ratio	1.5
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Route 100	161	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	0
2	0	1
3	0	0
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	6	6

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	44/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	41/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: Short segment with major historic impacts from straightening and encroachment resulting in an incised channel. We observed large deposits of coarse gravel suggesting that the channel is aggrading and in stage III.



Large deposits of coarse gravel.



Straightened portion of reach.

Stream: West River **Reach/Segt:** R30-A **Town:** Weston **Date Assessed**: 10/21/2022

Channel Length (ft): 2,273 **Channel Slope (%):** 1.54 **Sinuosity:** 1.12 **Watershed Area (mi^2):** 7.57

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	E

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	31.9
Bankfull Width (ft)	15
Max Depth (ft)	3.9
Width/Depth Ratio	5.1
Entrenchment Ratio	11.6
Incision Ratio	1.5

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Private	56	Scour above and below
Br	Kile Rd	56	Erosion above

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 3

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	1
2	2	0
3	0	0
4	0	1
5	0	0
6	0	0
7	-	2
#/mile	7	12

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	48/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	55/Fair-Good
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	C to E
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-31:** Passive Restoration – Corridor Easement and Buffer Planting

Reach Highlights: Segment is moderately incised, likely due to historic straightening. We did not observe signs of active widening or planform adjustment. The reach is stuck in Stage II due to moderate incision.



Beaver dam in reach.



Straightened portion of reach at bridge.

Stream: West River **Reach/Segt:** R30-C **Town:** Weston **Date Assessed**: 10/21/2022

Channel Length (ft): 7,152 **Channel Slope (%):** 1.54 **Sinuosity:** 1.12 **Watershed Area (mi^2):** 7.57

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Gravel
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	31.9
Bankfull Width (ft)	17
Max Depth (ft)	2.9
Width/Depth Ratio	7.2
Entrenchment Ratio	1.7
Incision Ratio	2.0

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Ettinger Rd	63	Erosion above and below
Br	Private	82	Scour above and below
Arch	Route 100	188	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	1
2	4	1
3	4	0
4	0	0
5	1	0
6	1	0
7	-	0
#/mile	8	1

Number of Debris Jams: 4

Step 6/7 Summary

RHA Score/Condition	44/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	44/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **WR-32:** Active Restoration – Bank Stabilization
- **WR-33:** Passive Restoration – Buffer Planting
- **WR-34:** Active Restoration – Floodplain Reconnection
- **WR-35:** Active Restoration – Channel Restoration
- **WR-36:** Passive Restoration – Buffer Plantings

Reach Highlights: Segment has extensive historic straightening and is general moderate to severely incised. Some areas of bank erosion show that widening and planform adjustment are starting; however, the majority of the segment remains in Stage II.



Recent fill in channel.



Portion of reach with limited buffer.

4.1.4 Winhall River - Phase 2 Assessment Summary

The Phase 2 assessed reaches on the Winhall River (T11.08) are described below (Figure 4.4).

- Reach T11.08
  - Reach begins near the intersection of Kendall Farm Road and Hunker Road and continues upstream for approximately 1.3 miles. Segment A has signs of recent incision and aggradation, with many active and recently abandoned flood chutes. Segment B is moderately incised and exacerbated by forest road encroachment. These segments were previously assessed and were included for re-assessment in this study.

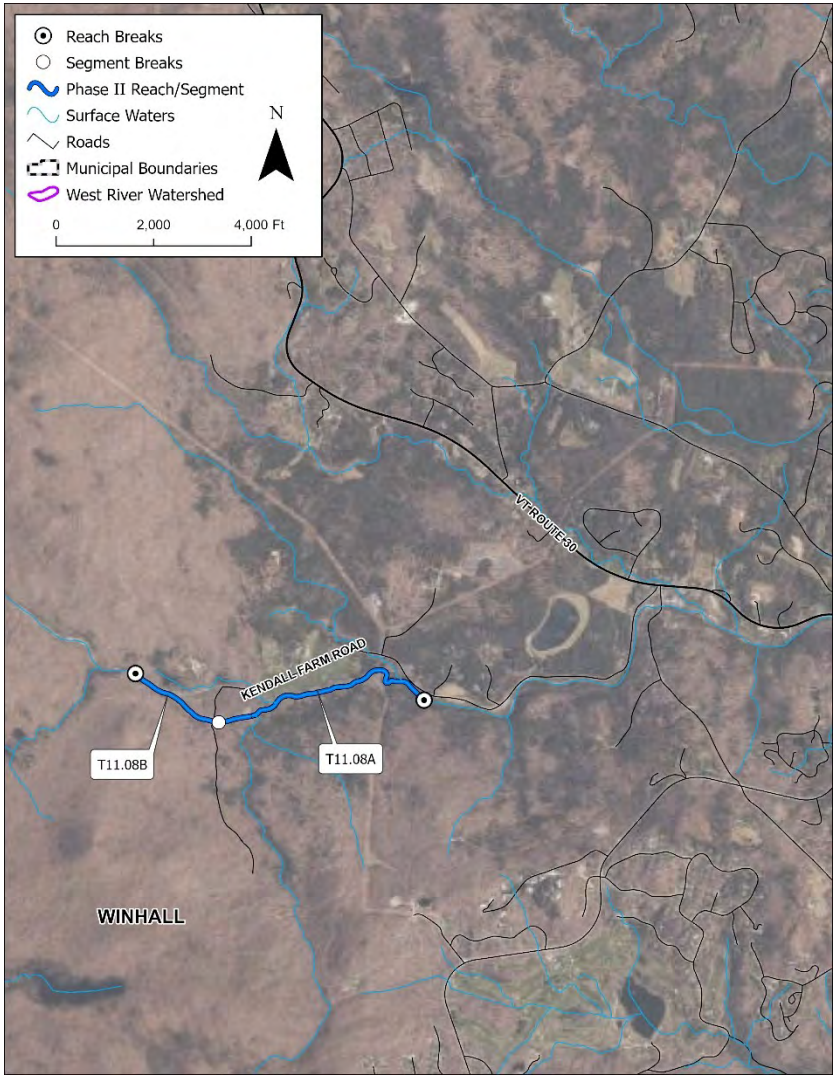


Figure 4.4: Winhall River reach and segment locations.

Stream: Winhall River **Reach/Segt:** T11.08-A **Town:** Winhall **Date Assessed**: 11/10/2022

Channel Length (ft): 4,274 **Channel Slope (%):** 1.17 **Sinuosity:** 1.07 **Watershed Area (mi²):** 20.25

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Broad
Bedform	Riffle-Pool	Braided
Median Substrate	Cobble	Gravel
Stream Type	C	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	49.2
Bankfull Width (ft)	49
Max Depth (ft)	3.2
Width/Depth Ratio	19.6
Entrenchment Ratio	1.5
Incision Ratio	1.4

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	18	1
2	23	0
3	9	0
4	13	1
5	0	0
6	1	0
7	-	0
#/mile	79	2

Number of Debris Jams: 6

Step 6/7 Summary

RHA Score/Condition	58/Fair-Good
Habitat Type Departure	Braided
RGA Score / Condition	49/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	C to B
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WHR-37:** Passive Restoration – Conservation
- **WHR-38:** Passive Restoration – Buffer Plantings and Agricultural BMP

Reach Highlights: The reach shows signs of recent incision and active aggradation with very large cobble/gravel bars filling the widened channel. Many flood chutes, both active and recently abandoned, were observed. The reach is in Stage III transitioning to Stage IV, with limited evidence of active erosion along the flood scoured banks.



Flood chute filled with sediment deposits.



Sediment deposits in channel.

Stream: Winhall River **Reach/Segt:** T11.08-B **Town:** Winhall **Date Assessed**: 11/10/2022

Channel Length (ft): 2,678 **Channel Slope (%):** 1.17 **Sinuosity:** 1.07 **Watershed Area (mi²):** 20.25

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Semi-confined
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Cobble	Cobble
Stream Type	C	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	49.2
Bankfull Width (ft)	55
Max Depth (ft)	2.9
Width/Depth Ratio	27.2
Entrenchment Ratio	1.4
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Lightfoot Camp Rd	122	Erosion above and below

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	3	0
2	0	0
3	0	0
4	0	0
5	0	0
6	1	0
7	-	0
#/mile	8	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	49/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	46/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	C to B
Stream Sensitivity	High

Impact Summary

Bank Erosion	**Stormwater**
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **WHR-39:** Active Restoration – Floodplain Restoration
- **WHR-40:** Active Restoration – Stormwater Management

Reach Highlights: The channel is moderately incised with evidence that incision was recent and may be ongoing during large flow events. Incision is likely exacerbated by the forest road encroachment. A stream type departure of C to B was assessed due to incision. The channel is overwidened and filling with coarse sediment deposits along the sides. Much less mid channel accumulation than downstream. Forest road along left bank is a significant encroachment and cuts off the historic valley/floodplain.



Scour on right bank.



Looking upstream from bridge.

4.1.5 Thompsonburg Brook - Phase 2 Assessment Summary

The Phase 2 assessed reaches on Thompsonburg Brook (T12) are described below (Figure 4.5).

- Reach T12.01
  - Short reach beginning at the confluence with the West River and continuing upstream for approximately 0.6 miles. The reach is moderately incised but appears to be stable.
- Reach T12.02
  - Reach follows Thompsonburg Road to a confluence with an unnamed tributary. The entire reach is encroached by the road and was likely straightened historically.
- Reach T12.03
  - Reach begins at the confluence with the first unnamed tributary and continues upstream to just southwest of the intersection of Thompsonburg Road and Fieldstone Way. Much of the reach Is encroached by Thompsonburg Road and is historically incised.
- Reach T12.04
  - Reach begins just southwest of the intersection of Thompsonburg Road and Fieldstone Way and continues upstream to just southwest of the intersection of VT Route 11 and Mansfield Lane. The reach has many areas of naturally or human caused confinement.

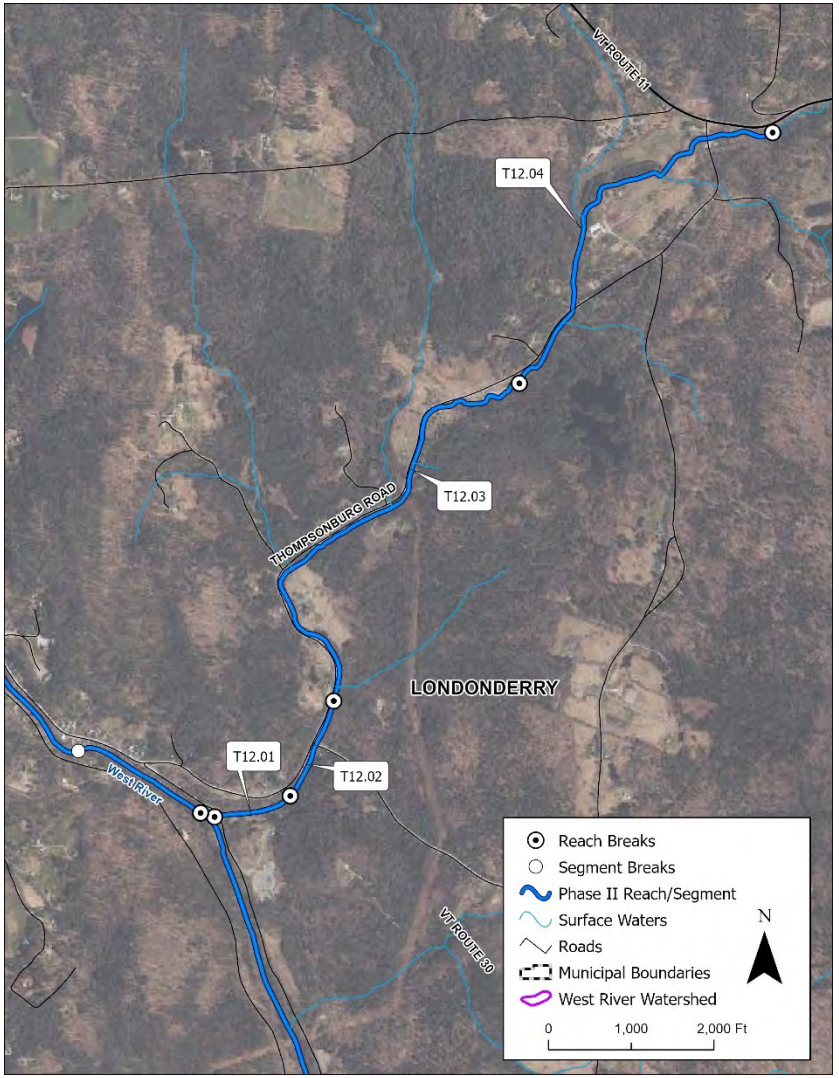


Figure 4.5: Thompsonburg Brook reach and segment locations.

Stream: Thompsonburg Brook **Reach/Segt:** T12.01 **Town:** Londonderry **Date Assessed**: 9/22/2022

Channel Length (ft): 977 **Channel Slope (%):** 2.15 **Sinuosity:** 1.02 **Watershed Area (mi²):** 9.02

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Narrow	Semi-confined
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	34.5
Bankfull Width (ft)	21
Max Depth (ft)	2.8
Width/Depth Ratio	12.5
Entrenchment Ratio	1.7
Incision Ratio	1.4

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Rowes Rd	70	None

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	3	2
2	2	0
3	0	0
4	1	0
5	0	0
6	0	0
7	-	0
#/mile	32	11

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	63/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	65/Good
Dominant Adjustment	Stable
CEM Model Stage	I
Stream Type Departure	No departure
Stream Sensitivity	Moderate

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The reach is moderately incised, but appears stable with no evidence of active widening, incision, or planform adjustment. Coarse substrate was observed for most of the bed and banks and nice step pool sequences in the lower portion and riffle pool in the upper portion. The reach appears stable.



Step-pool sequence in lower portion of reach.



Stable banks.

Stream: Thompsonburg Brook **Reach/Segt:** T12.02 **Town:** Londonderry **Date Assessed**: 7/29/2022

Channel Length (ft): 1,273 **Channel Slope (%):** 1.57 **Sinuosity:** 1.00 **Watershed Area (mi²):** 8.97

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Semi-confined	Semi-confined
Bedform	Step-Pool	Step-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	34.4
Bankfull Width (ft)	25
Max Depth (ft)	3.2
Width/Depth Ratio	10.0
Entrenchment Ratio	2.1
Incision Ratio	1.9

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Cross Rd	70	None

# of Other Constrictions: 0
# of Grade Controls: 2
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	3	2
2	1	0
3	6	2
4	1	0
5	0	0
6	0	0
7	-	0
#/mile	46	17

Number of Debris Jams: 1

Step 6/7 Summary

RHA Score/Condition	53/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	54/Fair-Good
Dominant Adjustment	No departure
CEM Model Stage	II
Stream Type Departure	Incision
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The majority of the reach is encroached by Thompsonburg Rd with near continuous armoring along the right bank. It is very likely that the reach was straightened when the road was constructed, decreasing valley width, but not likely changing the reference stream type. The reach maintained access to an elevated bench for most of the left bank, but was incised. We assessed as Stage II due to historic incision.





Encroachment from Thompsonburg Road.

Abandoned floodplain bench.

Stream: Thompsonburg Brook **Reach/Segt:** T12.03 **Town:** Londonderry **Date Assessed**: 7/29/2022

Channel Length (ft): 5,958 **Channel Slope (%):** 1.66 **Sinuosity:** 1.05 **Watershed Area (mi²):** 8.85

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Narrow
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	34.2
Bankfull Width (ft)	28
Max Depth (ft)	3.2
Width/Depth Ratio	11.1
Entrenchment Ratio	1.7
Incision Ratio	1.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Private	76	None
Br	Private	47	None
Br	Private	53	None
Br	Private	59	None

# of Other Constrictions: 0
# of Grade Controls: 4
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	11	10
2	11	13
3	9	7
4	6	5
5	5	1
6	5	0
7	-	0
#/mile	42	32

Number of Debris Jams: 6

Step 6/7 Summary

RHA Score/Condition	54/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	45/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **T12-41:** Active Restoration – Stormwater Management
- **T12-42:** Active Restoration – Bank Stabilization
- **T12-43:** Active Restoration – Bridge Replacement
- **T12-44:** Passive Restoration – Floodplain Restoration

Reach Highlights: The reach is highly variable with portions that were likely reference Bc; however, the majority of the reach is reference C with a broad valley. Much of the reach is encroached by Thompsonburg Road leading to an overall change in valley confinement to Narrow. Incision is likely historic and areas of mid channel sediment accumulation and several flood chutes were observed, suggesting that some Stage IV adjustments are occurring. We assessed the reach as Stage II due to historic incision and the lack of actual planform adjustment despite the sediment accumulation.



Flood chute.



Encroachment from Thompsonburg Road.

Stream: Thompsonburg Brook **Reach/Segt:** T12.04 **Town:** Londonderry **Date Assessed**: 11/2/2022

Channel Length (ft): 5,106 **Channel Slope (%):** 1.53 **Sinuosity:** 1.06 **Watershed Area (mi²):** 6.82

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	30.5
Bankfull Width (ft)	26
Max Depth (ft)	3.0
Width/Depth Ratio	12.0
Entrenchment Ratio	2.2
Incision Ratio	1.5

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Thompsonburg Rd	62	None
Br	Thompsonburg Rd	43	None
Br	Private	72	None

# of Other Constrictions: 0
# of Grade Controls: 4
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	14	7
2	20	0
3	0	3
4	6	0
5	0	0
6	0	0
7	-	0
#/mile	41	10

Number of Debris Jams: 2

Step 6/7 Summary

RHA Score/Condition	49/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	56/Fair-Good
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **T12-45:** Active Restoration – Bank Stabilization
- **T12-46:** Active Restoration – Bank Stabilization
- **T12-47:** Active Restoration – Bank Stabilization

Reach Highlights: The reach is variable with areas of naturally or human caused confinement. Encroachment from Thompsonsburg road increases incision in some locations. Overall, the reach has scattered areas of widening and planform adjustment but this is limited due to coarse native substrate and areas of historic bank armoring. We assessed the reach as Stage II due to historic incision and limited evidence of widening or planform adjustment. The reach is showing active aggradation and may be transitioning to stage III.



Stone armor on right bank.



Bank erosion adjacent to road.

4.1.6 Flood Brook and Farnum Brook - Phase 2 Assessment Summary

The Phase 2 assessed reaches on Flood Brook (T13) and Farnum Brook (T13.S2) are described below (Figure 4.6).

- Reach T13.04
  - Reach begins in a valley between the northeastern-most portion of Three Pond Road and the southwestern most portion of Forest Mountain Road. The reach then continues upstream to upstream of the confluence with Farnum Brook. The reach is slightly overwidened with extensive gravel deposition throughout the reach.
- Reach T13.S2.01
  - Reach begins upstream of the confluence with Flood Brook and continues upstream to just downstream of an unnamed tributary near where Farnum Brook crosses Moss Brook Road. Segment A shows evidence of very active aggradation throughout. Segment B is historically incised with coarse sediment deposition. Segment C is moderately incised due to historic straightening and a large historic berm that significantly reduces access to the left floodplain.

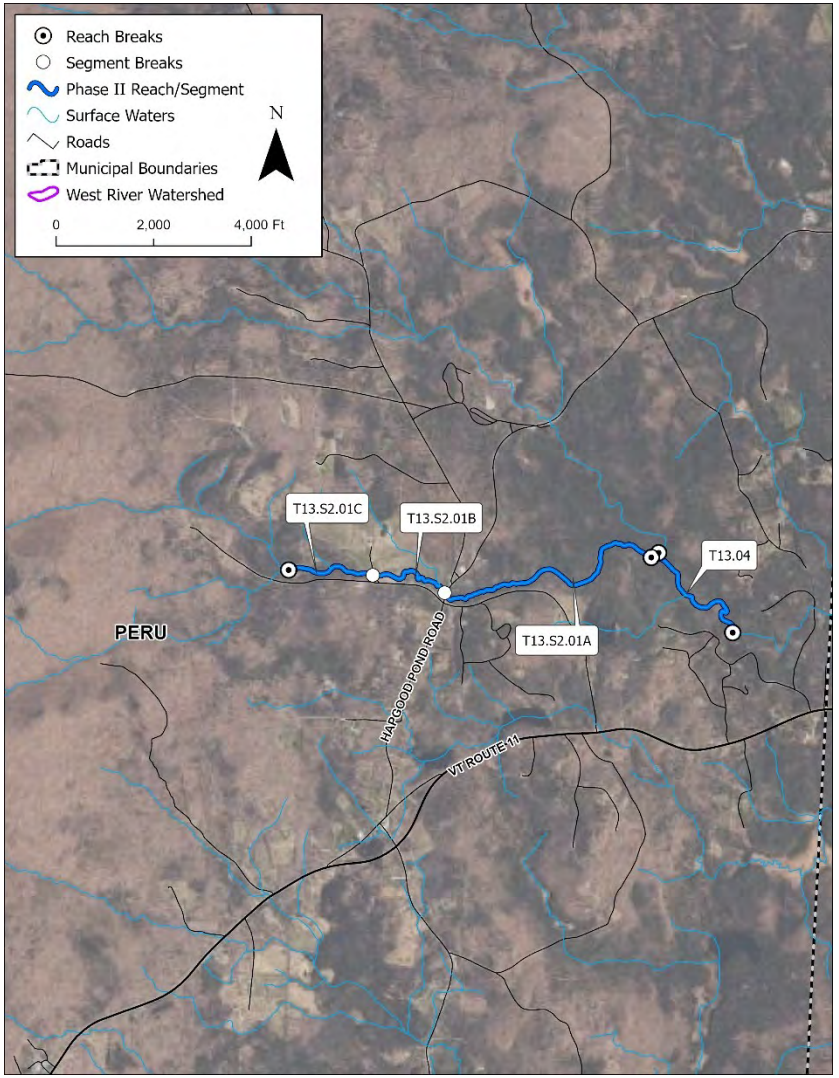


Figure 4.6: Flood Brook and Farnum Brook reach and segment locations.

Stream: Flood Brook **Reach/Segt:** T13.04 **Town:** Peru **Date Assessed:** 11/3/2022

Channel Length (ft): 2,951 **Channel Slope (%):** 2.20 **Sinuosity:** 1.27 **Watershed Area (mi²):** 7.67

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	32.1
Bankfull Width (ft)	35
Max Depth (ft)	3.1
Width/Depth Ratio	21.3
Entrenchment Ratio	3.4
Incision Ratio	1.6

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 3
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	18	4
2	33	0
3	7	2
4	32	1
5	0	0
6	1	0
7	-	0
#/mile	163	13

Number of Debris Jams: 2

Step 6/7 Summary

RHA Score/Condition	69/Good
Habitat Type Departure	No departure
RGA Score / Condition	55/Fair-Good
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The channel is slightly overwidened with extensive gravel deposition throughout the reach. We assessed the reach as Stage III due to aggradation.



Gravel deposits in reach.



Looking downstream at debris jam.

Stream: Farnum Brook **Reach/Segt:** T13.S2.01-A **Town:** Peru **Date Assessed**: 11/3/2022

Channel Length (ft): 5,301 **Channel Slope (%):** 3.58 **Sinuosity:** 1.07 **Watershed Area (mi²):** 2.07

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Narrow
Bedform	Step-Pool	Step-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	18.1
Bankfull Width (ft)	21
Max Depth (ft)	1.8
Width/Depth Ratio	16.4
Entrenchment Ratio	1.5
Incision Ratio	1.7

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Hapgood Pond Rd	55	None

# of Other Constrictions: 0
# of Grade Controls: 10
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	9	6
2	88	3
3	2	0
4	10	1
5	0	0
6	3	0
7	-	0
#/mile	112	10

Number of Debris Jams: 3

Step 6/7 Summary

RHA Score/Condition	64/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	59/Fair-Good
Dominant Adjustment	III
CEM Model Stage	Aggradation
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The segment showed evidence of recent but not active widening and very active aggradation throughout. Large side bars or coarse gravel and cobble were near continuous through the segment.



Large side bar and wood grade control.



Hapgood Pond Road bridge.

Stream: Farnum Brook **Reach/Segt:** T13.S2.01-B **Town:** Peru **Date Assessed**: 11/3/2022

Channel Length (ft): 1,910 **Channel Slope (%):** 3.58 **Sinuosity:** 1.07 **Watershed Area (mi²):** 2.07

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Step-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	B	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	18.1
Bankfull Width (ft)	14
Max Depth (ft)	1.8
Width/Depth Ratio	11.5
Entrenchment Ratio	5.7
Incision Ratio	1.6

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Culv	Batchelders Barn Rd	58	None
Br	Farm Bridge	89	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	0	0
2	0	3
3	0	0
4	1	0
5	0	0
6	0	0
7	-	1
#/mile	3	11

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	41/Fair-Poor
Habitat Type Departure	No Departure
RGA Score / Condition	49/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	B to C
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	**Constrictions**
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **FBR-48:** Passive Restoration – Buffer Plantings and Cattle Access
- **FBR-49:** Active Restoration – Aquatic Organism Passage
- **FBR-50:** Active Restoration – Berm Removal

Reach Highlights: This segment was assessed as Stage II due to historic incision. Coarse sediment deposition indicates that the segment may be aggrading; however, widening and planform adjustment were not active.



Cow pasture on right bank.



Bank erosion on left bank.

Stream: Farnum Brook **Reach/Segt:** T13.S2.01-C **Town:** Peru **Date Assessed**: 11/3/2022

Channel Length (ft): 1,866 **Channel Slope (%):** 3.58 **Sinuosity:** 1.07 **Watershed Area (mi²):** 2.07

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Step-Pool	Riffle-Pool
Median Substrate	Cobble	Gravel
Stream Type	B	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	18.1
Bankfull Width (ft)	18
Max Depth (ft)	1.4
Width/Depth Ratio	18.4
Entrenchment Ratio	1.5
Incision Ratio	2.7

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	5	0
2	18	0
3	1	0
4	7	0
5	0	0
6	1	0
7	-	0
#/mile	91	0

Number of Debris Jams: 0

Step 6/7 Summary

RHA Score/Condition	56/Fair-Good
Habitat Type Departure	No Departure
RGA Score / Condition	46/Fair-Poor
Dominant Adjustment	Aggradation
CEM Model Stage	III
Stream Type Departure	B to C
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- None

Reach Highlights: The reach is moderately incised due to historic straightening and a large historic berm that significantly reduces access to the left floodplain. Large deposits of coarse gravel and cobble throughout indicate that aggradation is the dominant process. Minimal widening or erosion was observed.



Berm adjacent to channel.



Ford crossing.

4.1.7 Utley Brook & Jones Brook - Phase 2 Assessment Summary

The Phase 2 assessed reaches on Utley Brook (T14) and Jones Brook (T14.S3) are described below (Figure 4.7).

- Reach T14.01
  - Reach begins at the confluence with the West River and continues upstream to a widening of the valley with a large complex of beaver dams. Segment A Is incised due to historic manipulation. Segment B was not assessed due to being impounded by a beaver dam.
- Reach T14.02
  - Reach begins upstream of an area significantly impounded by beaver activity and continues upstream to a confluence just south of the northern Londonderry-Landgrove border. The reach shows signs of active aggradation and widening.
- Reach T14.04
  - Reach begins on the western the Londonderry-Landgrove border and continues upstream to just upstream of the confluence with Jones Brook. The reach is deeply incised due to historical straightening.
- Reach T14.05
  - Reach begins just upstream of the confluence with Jones Brook and continues upstream to the Little Michigan Road bridge. The reach is dominated by aggradation and widening with areas of bank erosion and large sediment deposits observed throughout.
- Reach T14.S3.01
  - Reach at the confluence with Utley Brook and continues upstream to the western edge of Landgrove-Peru border. The reach is overwidened with many areas of active meander development.

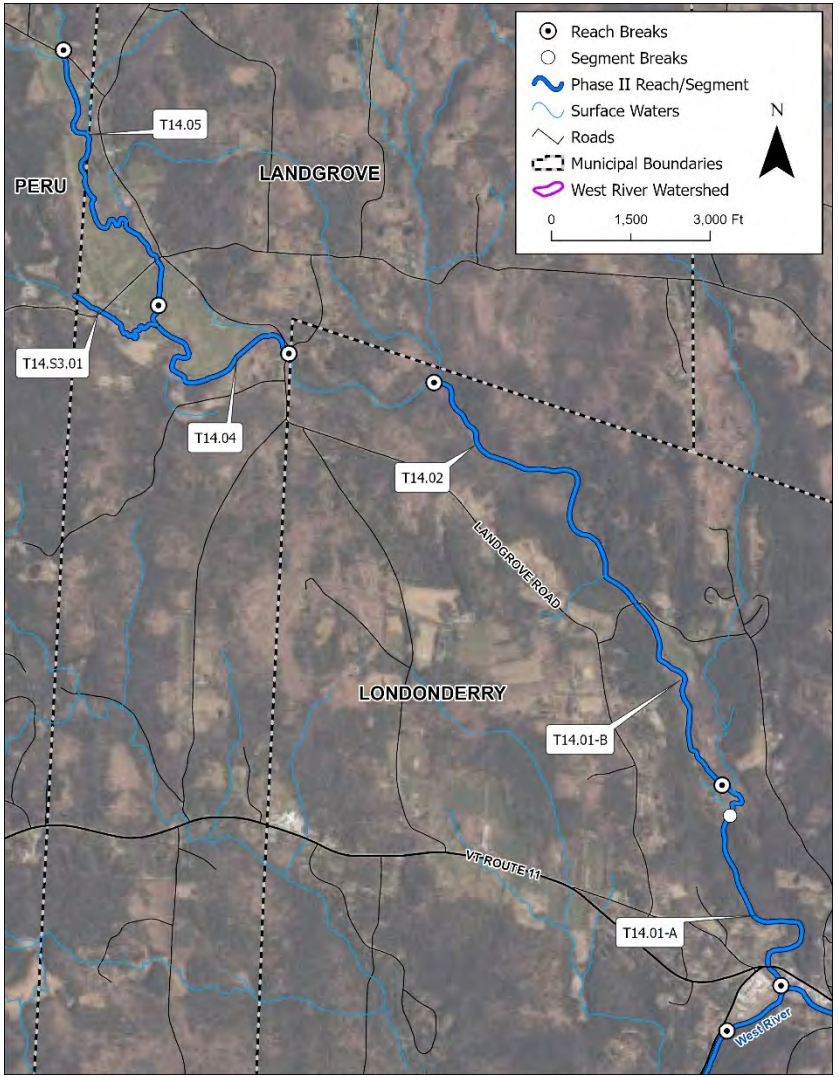


Figure 4.7: Utley Brook and Jones Brook reach and segment locations.

Stream: Utley Brook **Reach/Segt:** T14.01-A **Town:** Londonderry **Date Assessed**: 11/11/2022

Channel Length (ft): 4,669 **Channel Slope (%):** 0.90 **Sinuosity:** 1.34 **Watershed Area (mi^2):** 27.51

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Narrow	Narrow
Bedform	Riffle-Pool	Plane-Bed
Median Substrate	Cobble	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	56.3
Bankfull Width (ft)	69
Max Depth (ft)	3.2
Width/Depth Ratio	28.5
Entrenchment Ratio	2.9
Incision Ratio	1.8

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	5	0
2	2	0
3	1	0
4	1	2
5	0	0
6	1	0
7	-	0
#/mile	11	2

Number of Debris Jams: 2

Step 6/7 Summary

RHA Score/Condition	52/Fair-Good
Habitat Type Departure	Plane-Bed
RGA Score / Condition	50/Fair-Good
Dominant Adjustment	Widening
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

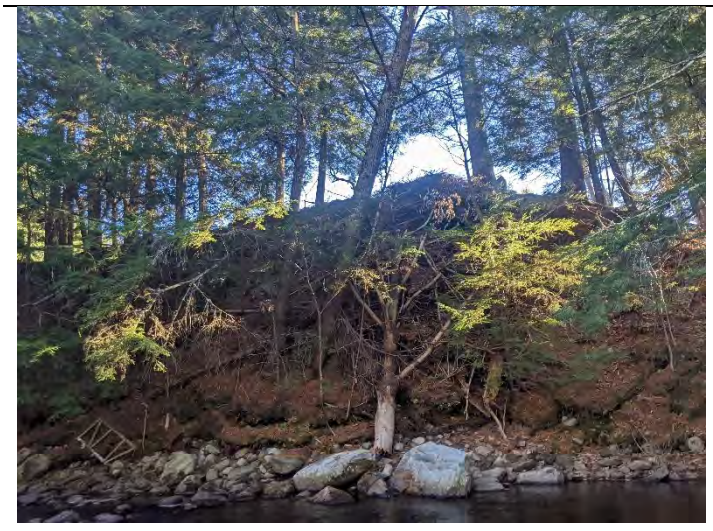
Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	Steep Riffle
Corridor Land Use	**Gully Erosion**
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **UB-51:** Active Restoration – Stormwater Management and Gully Stabilization
- **UB-52:** Active Restoration – Stormwater Management

Reach Highlights: The channel is incised likely due to historic manipulation, almost resulting in a departure to B. Banks indicated scour/erosion through most of the reach and the channel is overwidened, suggesting that widening is the dominant process.



Imminent mass failure.



Large gully coming down to stream.

Stream: Utley Brook **Reach/Segt:** T14.02 **Town:** Londonderry **Date Assessed**: 6/14/2022

Channel Length (ft): 10,803 **Channel Slope (%):** 1.41 **Sinuosity:** 1.09 **Watershed Area (mi²):** 24.71

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Broad	Broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Cobble	Cobble
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	53.7
Bankfull Width (ft)	58
Max Depth (ft)	2.8
Width/Depth Ratio	32.1
Entrenchment Ratio	1.9
Incision Ratio	1.3

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Barker Rd	119	None

# of Other Constrictions: 0
# of Grade Controls: 3
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	25	2
2	23	3
3	6	3
4	4	0
5	2	5
6	3	1
7	-	0
#/mile	31	7

Number of Debris Jams: 3

Step 6/7 Summary

RHA Score/Condition	57/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	41/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	Straightening
Flow Regulation	Headcut

Potential Projects in Reach

- **UB-56:** Passive Restoration – Corridor Easement

Reach Highlights: The reach is highly variable but consistently showing signs of active aggradation and areas of widening. The lower portion has a split channel following recent floods (Irene?) with even flow between the two channels at baseflow. Significant midchannel sediment accumulation was observed throughout.



Looking upstream at the bottom of a large split channel.



Sediment accumulation in reach.

Stream: Utley Brook **Reach/Segt:** T14.04 **Town:** Landgrove **Date Assessed**: 6/15/2022

Channel Length (ft): 4,676 **Channel Slope (%):** 0.21 **Sinuosity:** 1.49 **Watershed Area (mi²):** 21.72

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Plane Bed
Median Substrate	Gravel	Gravel
Stream Type	C	F

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	50.8
Bankfull Width (ft)	46
Max Depth (ft)	3.2
Width/Depth Ratio	17.5
Entrenchment Ratio	1.3
Incision Ratio	2.2

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts

# of Other Constrictions: 0
# of Grade Controls: 1
# of Beaver Dams: 0

Rapid Habitat Assessment

Rank	LWD	Pools
1	15	0
2	8	0
3	4	2
4	0	0
5	3	2
6	2	3
7	-	1
#/mile	36	9

Number of Debris Jams: 2

Step 6/7 Summary

RHA Score/Condition	48/Fair-Poor
Habitat Type Departure	Plane Bed
RGA Score / Condition	45/Fair-Poor
Dominant Adjustment	Incision
CEM Model Stage	II
Stream Type Departure	C to F
Stream Sensitivity	Extreme

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **UB-57:** Passive Restoration – Corridor Easement and Buffer Planting

Reach Highlights: The channel is deeply incised due to historical straightening. We assessed the reach as Stage II. However, aggradation and areas of widening were observed, suggesting that it is slowly transitioning to Stage III.



Mass failure on left bank.



Historically straightened channel.

Stream: Utley Brook **Reach/Segt:** T14.05 **Town:** Landgrove & Peru **Date Assessed**: 6/15/2022

Channel Length (ft): 6,451 **Channel Slope (%):** 1.13 **Sinuosity:** 1.21 **Watershed Area (mi²):** 17.72

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	C

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	46.4
Bankfull Width (ft)	41
Max Depth (ft)	2.8
Width/Depth Ratio	29.7
Entrenchment Ratio	2.5
Incision Ratio	1.9

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Hapgood Pond Rd	194	None
Br	Little Michigan Rd	120	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 1

Rapid Habitat Assessment

Rank	LWD	Pools
1	19	2
2	13	0
3	11	3
4	0	2
5	8	8
6	2	3
7	-	00
#/mile	60	20

Number of Debris Jams: 4

Step 6/7 Summary

RHA Score/Condition	57/Fair-Good
Habitat Type Departure	No departure
RGA Score / Condition	46/Fair-Poor
Dominant Adjustment	Widening/ Aggradation
CEM Model Stage	III
Stream Type Departure	No departure
Stream Sensitivity	Very high

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	**Migration**
Development	**Steep Riffle**
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **UB-58:** Passive Restoration – Buffer Planting
- **UB-59:** Active Restoration – Channel Restoration

Reach Highlights: The reach was dominated by aggradation and widening with areas of bank erosion and large sediment deposits observed throughout. The channel is incised, likely due to historic management.



Major erosion on right bank.



Hapgood Pond Road bridge.

Stream: Jones Brook **Reach/Segt:** T14.S3.01 **Town:** Landgrove & Peru **Date Assessed**: 11/2/2022

Channel Length (ft): 2,058 **Channel Slope (%):** 2.14 **Sinuosity:** 1.36 **Watershed Area (mi^2):** 3.43

Stream Type Summary

	P1 Reference	P2 Assessed
Confinement	Very broad	Very broad
Bedform	Riffle-Pool	Riffle-Pool
Median Substrate	Gravel	Gravel
Stream Type	C	B

Ph2 Cross-Section Data

Ref. Bankfull Width (ft)	22.5
Bankfull Width (ft)	21
Max Depth (ft)	2.3
Width/Depth Ratio	16.3
Entrenchment Ratio	1.7
Incision Ratio	2.0

Crossing/Constriction Summary

Type	Location	% wbkf	Impacts
Br	Hapgood Pond Rd	96	None

# of Other Constrictions: 0
# of Grade Controls: 0
# of Beaver Dams: 1

Rapid Habitat Assessment

Rank	LWD	Pools
1	1	6
2	7	4
3	0	2
4	0	0
5	0	0
6	0	0
7	-	0
#/mile	21	31

Number of Debris Jams: 6

Step 6/7 Summary

RHA Score/Condition	43/Fair-Poor
Habitat Type Departure	No departure
RGA Score / Condition	44/Fair-Poor
Dominant Adjustment	Planform Adjustment
CEM Model Stage	IV
Stream Type Departure	C to B
Stream Sensitivity	High

Impact Summary

Bank Erosion	Stormwater
Armoring	Constrictions
Riparian Buffer	**Deposition**
Encroachment	Migration
Development	Steep Riffle
Corridor Land Use	Gully Erosion
Mass Failure	**Straightening**
Flow Regulation	Headcut

Potential Projects in Reach

- **UB-60:** Passive Restoration – Corridor Easement and Buffer Planting

Reach Highlights: The reach is overwidened with many areas of active meander development. Large sediment deposits and erosion were observed throughout. We assessed the reach as stage IV with active planform adjustment along the widened and historically incised channel. We classified the reach as a departure from E to B due to incision.



Typical section of reach with limited buffer and footing drain discharge.



Erosion on outside bend of meander.

4.2 Phase 2 Results Summary

4.2.1 Dominant Adjustment Processes and Stream Type Departure

We observed two dominant adjustment processes and resulting stream type departures throughout the West River study area. Incision primarily due to historic straightening and ongoing encroachment was the dominant process for most of the mainstem reaches and the cause of most stream type departures (F-type). Aggradation and widening were more commonly observed in tributary reaches and portions of the mainstem near confluences of significant tributaries. Recent large flood events continue to mobilize coarse sediment throughout the watershed, which is likely increasing or maintaining incision in the encroached reaches and increasing widening and aggradation in the less encroached areas, particularly those with lower channel slope Stream type departures (per Rosgen, 1994) are summarized below (Table 4.3) to better describe the reaches where physical changes in channel morphology have accompanied sediment regime changes.

Table 4.3: Summary of stream type departures from reference conditions

Phase 2 Segment ID	Stream Type Departure	Dominant Adjustment Type
R10-B	B to F	Widening/Aggradation
R18	B to F	Incision
R19-A	B to F	Incision
R19-B	B to F	Incision
R19-C	B to C	Widening/Aggradation
R20	B to F	Incision
R22-B	C to F	Incision
R23	C to F	Incision
R25-A	C to F	Incision
R25-D	C to F	Incision
R26	C to F	Incision
R27	C to B	Aggradation
R30-A	C to E	Aggradation
R30-C	C to F	Incision
T11.08-A	C to B	Aggradation
T11.08-B	C to B	Widening/Aggradation
T13.S2.01-B	B to C	Incision
T13.S2.01-C	B to C	Aggradation
T14.04	C to F	Incision
T14.S3.01	C to B	Planform Adjustment

4.2.2 RHA/RGA

Rapid Habitat Assessment (RHA) and Rapid Geomorphic Assessment (RGA) scores for all Phase 2 reaches/segments are summarized in Table 4.4 and Figures 4.8 and 4.9. FEA divided the "Fair" category into "Low Fair" and "High Fair" to better indicate which reaches were closer to "Poor" or "Good" respectively. The "Fair" scores were split at the numerical mean for the categories (49%). Habitat ratings were general in the Fair categories, with Poor ratings limited to main stem reaches with significant buffer impacts from development and road encroachment. T13.04 on Flood Brook was the only assessed reach with a Good habitat rating. This reach had no impacts from channel management and maintained dense forested buffers with numerous LWD inputs.

Geomorphic ratings were generally Fair-Poor along the mainstem due to incision, primarily caused by historic straightening and road/development encroachment. Tributary reaches were evenly divided between Fair-Good and Fair-Poor due to incision or active aggradation. The first reach of Thompsonburg Brook (T12.01) was the only Good geomorphic rating. This short and relatively steep reach was stable.

Detailed summaries of geomorphic data for each segment are provided in Appendix A. Habitat assessment summary data is provided in Appendix B.

Table 4.4: Summary RHA and RGA for all Phase 2 Reaches and Segments

Stream	Reach/Segment	RHA Score	RHA Condition	RGA Score	RGA Condition
West River	R10-B	46%	Fair-Poor	39%	Fair-Poor
	R11	52%	Fair-Good	39%	Fair-Poor
	R12	48%	Fair-Poor	41%	Fair-Poor
	R13-A	50%	Fair-Good	45%	Fair-Poor
	R13-B	51%	Fair-Good	46%	Fair-Poor
	R18	50%	Fair-Good	46%	Fair-Poor
	R19-A	43%	Fair-Poor	35%	Fair-Poor
	R19-B	31%	Poor	44%	Fair-Poor
	R19-C	59%	Fair-Good	50%	Fair-Good
	R20	41%	Fair-Poor	34%	Poor
	R21	41%	Fair-Poor	36%	Fair-Poor
	R22-B	38%	Fair-Poor	43%	Fair-Poor
	R23	51%	Fair-Good	41%	Fair-Poor
	R24-A	51%	Fair-Good	40%	Fair-Poor
	R24-B	44%	Fair-Poor	47%	Fair-Poor
	R25-A	51%	Fair-Good	47%	Fair-Poor
	R25-B	51%	Fair-Good	52%	Fair-Good
	R25-C	50%	Fair-Good	49%	Fair-Poor
	R25-D	45%	Fair-Poor	47%	Fair-Poor
	R26	25%	Poor	29%	Poor
	R27	28%	Poor	48%	Fair-Poor

Table 4.4: Summary RHA and RGA for all Phase 2 Reaches and Segments

West River	R28-A	40%	Fair-Poor	54%	Fair-Good
	R28-B	48%	Fair-Poor	43%	Fair-Poor
	R29-A	60%	Fair-Good	61%	Fair-Good
	R29-B	44%	Fair-Poor	41%	Fair-Poor
	R30-A	48%	Fair-Poor	55%	Fair-Good
	R30-C	44%	Fair-Poor	44%	Fair-Poor
Winhall River	T11.08-A	58%	Fair-Good	49%	Fair-Poor
	T11.08-B	49%	Fair-Poor	46%	Fair-Poor
Thompsonburg Brook	T12.01	63%	Fair-Good	65%	Good
	T12.02	53%	Fair-Good	54%	Fair-Good
	T12.03	54%	Fair-Good	45%	Fair-Poor
	T12.04	49%	Fair-Poor	56%	Fair-Good
Flood Brook	T13.04	69%	Good	55%	Fair-Good
Farnum Brook	T13.S2.01-A	64%	Fair-Good	59%	Fair-Good
	T13.S2.01-B	41%	Fair-Poor	49%	Fair-Poor
	T13.S2.01-C	56%	Fair-Good	46%	Fair-Poor
Utley Brook	T14.01-A	52%	Fair-Good	50%	Fair-Good
	T14.02	57%	Fair-Good	41%	Fair-Poor
	T14.04	48%	Fair-Poor	45%	Fair-Poor
	T14.05	57%	Fair-Good	46%	Fair-Poor
Jones Brook	T14.S3.01	43%	Fair-Poor	44%	Fair-Poor

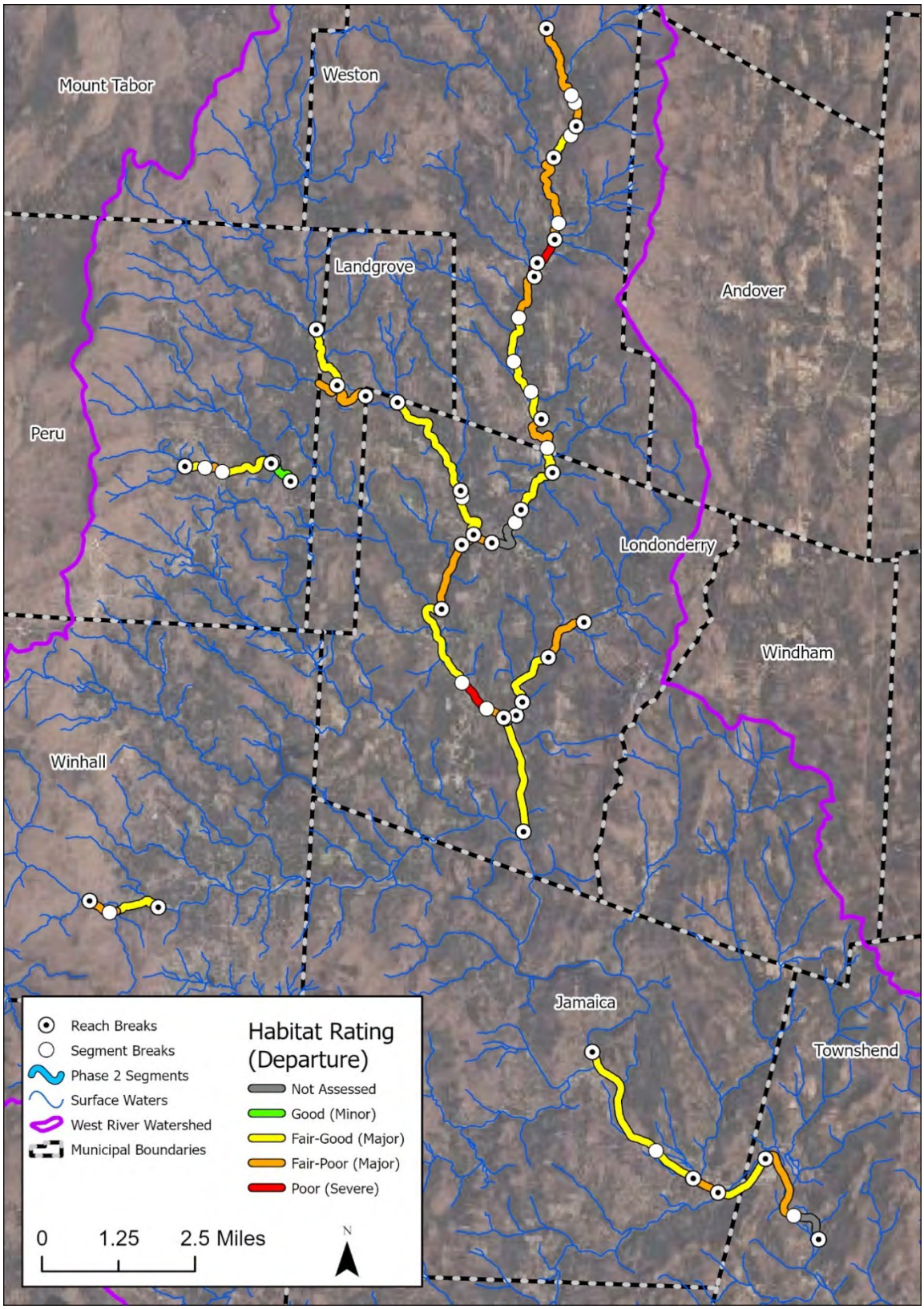


Figure 4.8: Rapid Habitat Assessment ratings for the West River watershed.

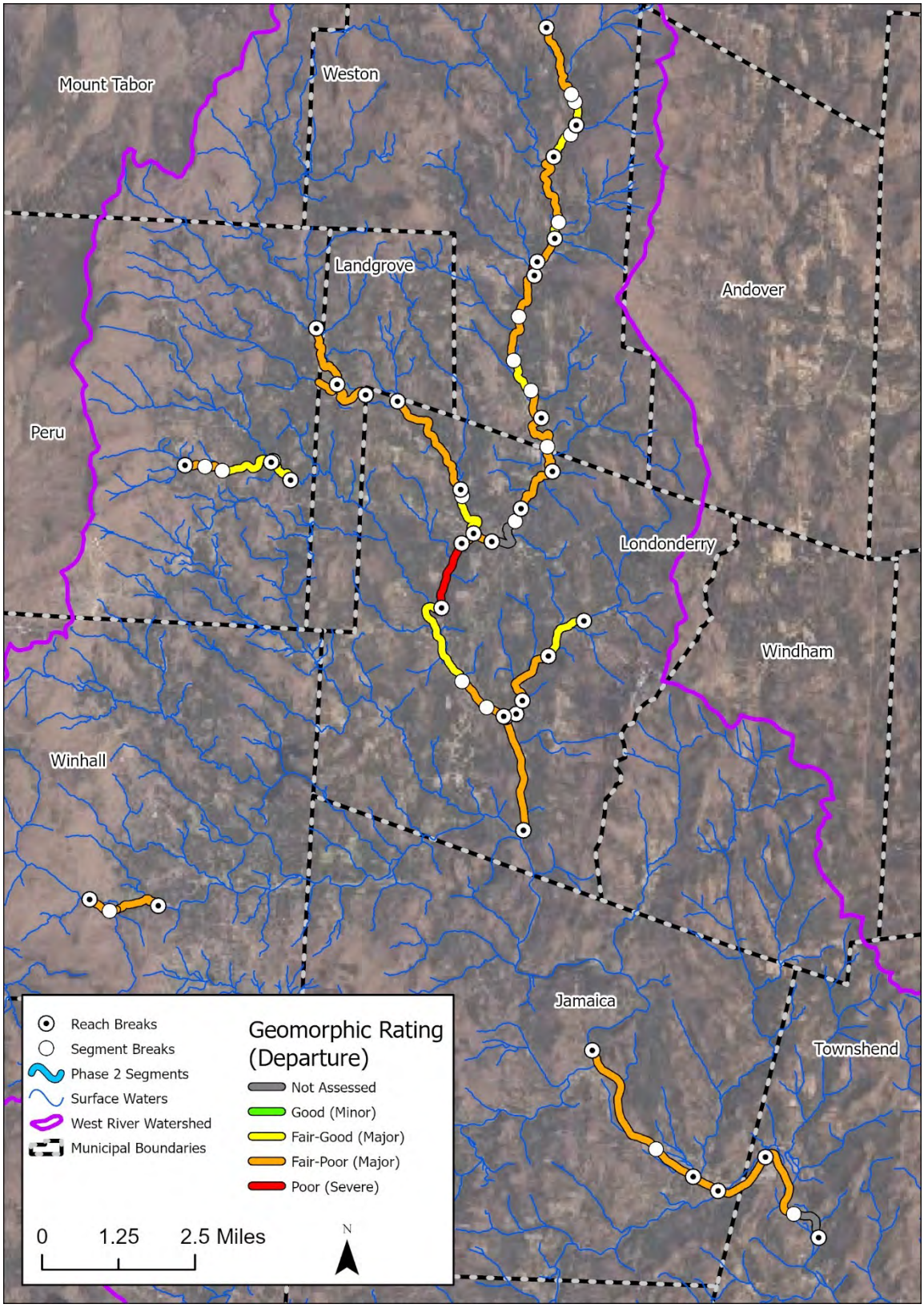


Figure 4.9: Rapid Geomorphic Assessment ratings for the West River watershed.

4.2.3 Sensitivity Analysis

The methods outlined in the VTANR Corridor Planning Guide have been used to describe the stream sensitivities of the segments in the West River study area. Using the stream geometry and substrate data in conjunction with overall geomorphic stability (RGA score) as determined during the Phase 2 surveys, stream sensitivity ratings have been assigned to each segment. Extreme sensitivity ratings were all due to stream type departures (F-type) from incision. Very high ratings were typically in reaches that had smaller substrate which is more prone to transport (Table 4.5 and Figures 4.10).

Table 4.5: Stream sensitivity summary

Stream	Reach/Segment	Stream Type	Geomorphic Condition	Sensitivity
West River	R10-B	F3	Fair-Poor	Extreme
	R11	B4	Fair-Poor	High
	R12	B3	Fair-Poor	High
	R13-A	C4	Fair-Poor	Very High
	R13-B	C3	Fair-Poor	High
	R18	F3	Fair-Poor	Extreme
	R19-A	F2	Fair-Poor	High
	R19-B	F1	Fair-Poor	High
	R19C	C3	Fair-Good	High
	R20	F3	Poor	Extreme
	R21	C3	Fair-Poor	High
	R22-B	F4	Fair-Poor	Extreme
	R23	F4	Fair-Poor	Extreme
	R24-A	C4	Fair-Poor	Very High
	R24-B	C4	Fair-Poor	Very High
	R25-A	F3	Fair-Poor	Extreme
	R25-B	C3	Fair-Good	High
	R25-C	C3	Fair-Poor	High
	R25-D	F3	Fair-Poor	Extreme
	R26	F2	Poor	High
	R27	B4	Fair-Poor	High
	R28-A	C4	Fair-Good	Very High
	R28-B	C4	Fair-Poor	Very High
	R29-A	B3	Fair-Good	High
	R29-B	B3	Fair-Poor	High
	R30-A	E4	Fair-Good	Very High
	R30-C	F4	Fair-Poor	Extreme
Winhall River	T11.08-A	B4	Fair-Poor	High
	T11.08-B	B3	Fair-Poor	High

Table 4.5: Stream sensitivity summary

Stream	Reach/Segment	Stream Type	Geomorphic Condition	Sensitivity
Thompsonburg Brook	T12.01	B3	Good	Moderate
	T12.02	B3	Fair-Good	High
	T12.03	C3	Fair-Poor	High
	T12.04	C3	Fair-Good	High
Flood Brook	T13.04	C4	Fair-Good	Very High
Farnum Brook	T13.S2.01-A	B3	Fair-Good	High
	T13.S2.01-B	C3	Fair-Poor	High
	T13.S2.01-C	C4	Fair-Poor	High
Utley Brook	T14.01-A	C4	Fair-Good	Very High
	T14.02	C3	Fair-Poor	High
	T14.04	F4	Fair-Poor	Extreme
	T14.05	C4	Fair-Poor	Very High
Jones Brook	T14.S3.01	B4	Fair-Poor	High

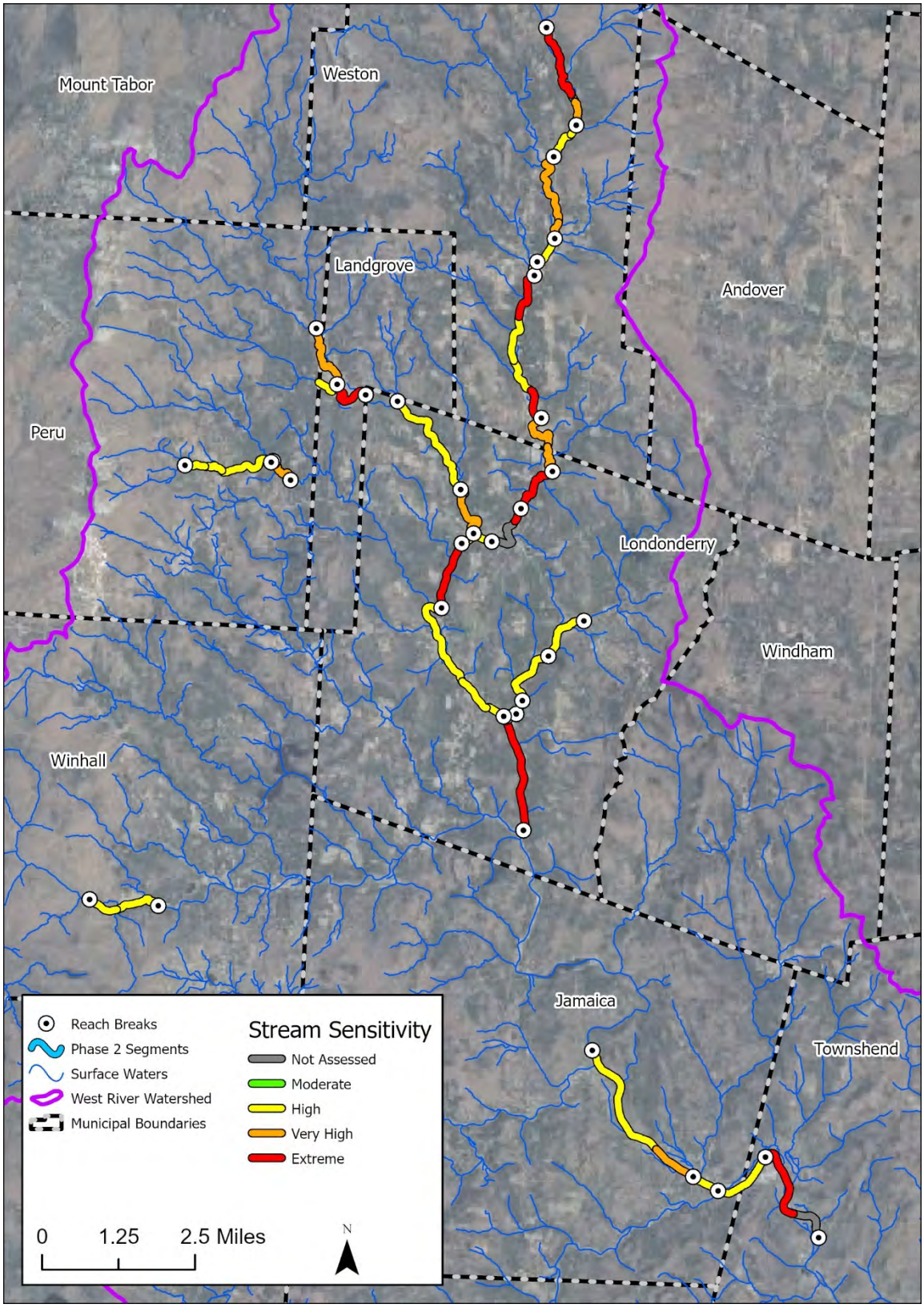


Figure 4.10: Stream Sensitivity ratings for the West River watershed.

5.0 Preliminary Project Identification

5.1.1 Stormwater Runoff

Increased stormwater runoff, even in less developed and rural areas of the West River watershed, can increase peak flood flows and the erosive power of the streams. Stormwater runoff and the associated sediment loading from gravel roads is a primary management concern for rural watersheds like the West River.

In the future, if development pressures heighten concerns about impacts from stormwater runoff, the towns and municipalities in the watershed could consider enacting local standards and guidelines for stormwater treatment or mitigation. Alternatively, concerns about stormwater management can be raised during local development review as necessary. Local planning efforts are important to control and monitor stormwater and development impacts on natural resources. By planning proactively, towns can reduce long-term costs and risks associated with stormwater runoff. Options that the towns could consider at the local level include:

- Requiring stormwater controls for development projects which are not large enough in size to fall under regulatory permits (less than 1/2 acre impervious cover for Vermont), but likely have a measurable impact on the conditions of adjacent waterbodies (e.g., habitat, water quality).
- Encouraging low impact development and use of green stormwater infrastructure through development density incentives for projects with reduced impervious cover footprints.

5.1.2 Flood Hazard Zones

<u>Floodplain Mapping</u>

Many Vermont communities found along rivers large and small have faced significant property losses and risks to public safety during past flood events. The West River study area has near complete coverage by detailed FEMA flood studies, however these were primarily completed in 2007, prior to multiple significant flooding events. Several of the larger tributaries, including the Winhall River, Ball Mountain Brook, and Wardsboro Brook, are mobilizing huge volumes of coarse sediment, likely exacerbated by recent flooding. These areas are particularly dynamic and may benefit from additional floodplain mapping and modeling.

<u>River Corridors</u>

Damages from fluvial erosion are of high concern in the West River watershed. Towns and Municipalities can reduce flood recovery and infrastructure maintenance costs and increase public safety by limiting development in areas adjacent to rivers with a high potential for vertical and lateral adjustment. The statewide river corridor developed by VTDEC represents a useful "first-cut" mapping of the area a river or stream requires to redevelop or maintain equilibrium (i.e., least erosive) conditions over the long term. The statewide corridor is generated based on the meander belt width of the channel and includes an additional 50-foot buffer on each side. River corridor mapping can be improved with field survey data of existing channel morphology and valley walls, such as the data compiled for this project. The Towns of Landgrove, Peru, Stratton, Weston, and Winhall are all high priority for River Corridor mapping. Municipal zoning regulations based on the statewide or an improved river corridor map should be considered to

better map flood and erosion risks for both the safety and protection of their citizens, and the infrastructure controlled by the municipality.

5.1.3 Stream Crossings

Undersized and poorly aligned river crossings interrupt flood flows, sediment and woody debris movement downstream, and fish and wildlife migration. These conditions result in: 1) channel instability and/or damage to infrastructure and personal property; 2) increased flooding; 3) decreased fish and wildlife population health; and 4) degraded water quality. Many structures in the West River study area are currently undersized and causing various problems such as upstream sediment/debris deposition, excessive erosion, and limited aquatic organism passage (Figure 5.1, Tables 5.1 and 5.2). Undersized municipal, private, and farm structures were observed throughout the study reaches. Resizing these structures to accommodate expected discharge and sediment loads and placing them in proper alignment with stream channels is highly recommended. This action will reduce the structures' impact on both water quality and geomorphology for the West River and its tributaries.



Figure 5.1: Slightly undersized culvert with a large scour pool on Segment T13.S2.01B (Farnum Brook).

Table 5.1: Summary of culvert data in the West River watershed

Map ID	SGA Reach/ Segment	Municipality	SGAID	Location	% Bankfull Width	Geomorphic Compatibility	Aquatic Organism Passage* (AOP)	AOP Retrofit Potential**
C01	T13.S2.01-B	Peru	100014000002071	Batchelders Barn Road	58%	Partially Compatible	No AOP	MLL

*Notes on AOP

Green: Full AOP for all aquatic organisms

Gray: Reduced AOP for all aquatic organisms

Orange: No AOP for all aquatic organisms except adult salmonids
Red: No AOP for all aquatic organisms including adult salmonids

** Notes on AOP Retrofit Potential:
H: High probability the existing culvert can be retrofitted
M: Medium probability the existing culvert can be retrofitted
L: Low probability the existing culvert can be retrofitted

Position 1 (left): For strong swimmers

Position 2 (Center): For moderate swimmers
Position 3 (right): For weak swimmers

Table 5.2: Summary of bridge data in the West River watershed

Map ID	SGA Reach/ Segment	Town	SGAID	Location	Material	Channel Width (ft)	Structure Width (ft)	Structure Height (ft)	Structure Span (ft)	% Bankfull Width
B01	R12	Jamaica	200100000013092	Route 100S	Concrete	143	34	25	274	192%
B02	R13-B	Jamaica	200030000213092	Route 30	Concrete	139	40	22	197	142%
B03	R13-B	Jamaica	300019000013091	Depot Street	Steel	139	15	15	153	110%
B04	R19-B	Londonderry	200100000013102	Route 100	Steel	94	50	16	125	133%
B05	R19-C	Londonderry	200100000113102	Route 100	Steel	94	40	14	140	149%
B06	R23	Londonderry	400015000013101	Cobble Hill Road	Timber	66	18	16	36	55%
B07	R24-B	Weston	200100000014212	Route 100	Steel	65	60	15	100	154%
B08	R26	Weston	990002000014211	Lawrence Hill Road	Concrete	55	36	18	44	80%
B09	R27	Weston	700000000014211	Private Farm Bridge	Steel	52	14	7	34	66%
B10	R28-B	Weston	700000000014213	TH 19	Steel	51	14	7	60	117%
B11	R28-B	Weston	200022000001011	Greendale Road	Steel	51	22	13	60	117%
B12	R29-B	Weston	200100000114212	Route 100	Concrete	35	38	10	56	161%
B13	R30-A	Weston	700000000114213	Private Road	Timber	32	10	5.5	18	56%
B14	R30-A	Weston	100014000001011	Kile Road	Timber	32	30	6	18	56%
B15	R30-C	Weston	100047000014211	Ettinger Road	Concrete	32	20	6	20	63%
B16	R30-C	Weston	700000000114211	Private Driveway	Timber	32	12	8	26	82%
B17	R30-C	Weston	300100000014212	Route 100	Aluminum or Iron	32	18	6	60	188%
B18	T11.08-B	Winhall	100000000602161	Lightfoot Camp Road	Steel	49	16	18	60	122%
B19	T12.01	Londonderry	400038000013101	Rowes Road	Concrete	35	17	12	24	70%
B20	T12.02	Londonderry	100037000013101	Cross Road	Concrete	34	32	12	24	70%
B21	T12.03	Londonderry	700000000913103	Private Road	Steel	34	16	10	26	76%
B22	T12.03	Londonderry	700000001013103	Private Road	Steel	34	16	5	16	47%
B23	T12.03	Londonderry	700000001113103	Private Road	Steel	34	12	7.5	18	53%
B24	T12.03	Londonderry	700000000813103	Private Road	Steel	34	16	7	20	59%
B25	T12.04	Londonderry	200002000013101	Thompsonburg Road	Concrete	31	22	7.5	19	62%
B26	T12.04	Londonderry	100002000013101	Thompsonburg Road	Concrete	31	23.5	7.5	13	43%
B27	T12.04	Londonderry	700000001213103	Private Road	Timber	31	10	5	22	72%

Table 5.2: Summary of bridge data in the West River watershed

Map ID	SGA Reach/ Segment	Town	SGAID	Location	Material	Channel Width (ft)	Structure Width (ft)	Structure Height (ft)	Structure Span (ft)	% Bankfull Width
B28	T13.S2.01-A	Peru	100001000002071	Hapgood Pond Road	Concrete	18	34	11.5	10	55%
B29	T13.S2.01-B	Peru	700000000002071	Private Farm Bridge	Steel	18	10	4	16	89%
B30	T14.02	Londonderry	100009000013101	Barker Road	Steel	54	34	16	64	119%
B31	T14.05	Landgrove	100001000002051	Hapgood Pond Road	Concrete	46	26	16	90	194%
B32	T14.05	Peru	100006000002071	Little Michigan Road	Steel	46	26	11	55	120%
B33	T14.S3.01	Landgrove	400026010613101	Hapgood Pond Road	Steel	14	31.4	8.2	13.5	96%

5.2 Site-Level Project Opportunities

The site-level projects developed for the West River watershed are provided in Appendix E. The project strategy, technical feasibility, and priority for each project are listed by project number and reach/segment. A total of 55 projects were identified to promote the restoration or protection of channel stability and aquatic habitat. Five (5) additional projects were identified where channel migration or widening are threatening adjacent infrastructure. The project table summarizes key information for each project, including the site stressors and constraints, project strategy, priorities for hazard mitigation and ecological benefit, relative costs (i.e., low, moderate, and high), and potential partners and funding sources.

The project summary table includes a coarse prioritization, using our best professional judgment (and input from VTDEC and other local stakeholders), of hazard mitigation and ecological benefits. Many river corridor restoration projects help mitigate flood and erosion hazards and improve the ecological conditions of the reach and watershed as a whole (e.g., improved habitat, protection of water quality, etc.). However, some project types provide a greater benefit to one over the other. While it is difficult to place a specific value on each project, rankings of "low," "medium," and "high" are intended to provide a means to compare the types of benefits each project provides relative to the others. A summary of what is meant by these two priority types is provided below.

> *Hazard Mitigation Priority:* refers to the potential for the project to mitigate flood and erosion hazards for the river corridor in the reach and in downstream areas. For example, replacing an undersized culvert with an appropriately sized structure could reduce flood/erosion hazards around the structure and downstream.
>
> *Ecological Benefits Priority:* refers to the potential for the project to improve aquatic habitat conditions and water quality in the reach and watershed. For example, a riparian buffer planting will improve habitat by increasing shading along the river and reducing long-term bank erosion.

The project locations for the study area are included on the map provided in the Potential Project Map and the Reach Impact Maps (Appendix D). The 60 projects are further broken down by category as follows: 34 active geomorphic restoration projects and 26 passive geomorphic restoration projects. Five (5) of the active restoration projects are focused on bank stabilization to protect transportation infrastructure. These projects likely do not fit within the river restoration funding framework, but are worth documenting for overall flood resiliency within the watershed. Project descriptions are provided in Appendix E.

5.2.1 High Priority Project Selection for Project Packets

FEA hosted multiple meetings to discuss the potential projects with VTDEC and Windham Regional Commission staff to select a total of five (5) high priority projects for further exploration and development. Several of the project packets include multiple individual projects that are on the same property and/or would be more successful when implemented together. A brief description of each selected project is provided below.

- **WR-10/WR-11:** Floodplain reconnection including leachfield removal to provide flood relief to commercial properties along Route 11 in Londonderry.

- **WR-24:** Floodplain reconnection, conservation easement, and riparian plantings on a section of river backwatered by the Weston dam. Reconnecting the floodplain would mitigate flood damage to businesses and infrastructure along Route 100.
- **WR-31:** Corridor protection or easement and buffer planting along a section of the West River mainstem that maintains good floodplain access but has diminished buffers and meander development.
- **WHR-37-40:** Conservation easement to protect critical floodplain areas on an extremely active section of river with large amounts of coarse sediment deposition. Buffer planting along the edge of a VLT conserved hayfield. Flood chute reconnection at the upstream start of an alluvial fan area. Sediment management from a Class-4 road.
- **FBT 48-49:** Buffer plantings and installation of a stabilized cattle water access with fencing along the southern bank. Installation of tailwater control structures to raise the channel elevation and provide AOP through a culvert.

Project Conceptual Design (30%) packets and implementation cost estimates are included in **Appendix F**. The floodplain cut projects include restoration extents and cost estimates for a preliminary design of the largest feasible project area. These projects would remain highly beneficial if budget limitations require a reduced floodplain restoration footprint.

6.0 Conclusions and Recommendations

This study built upon previously completed Stream Geomorphic Assessments and River Corridor Plans completed for several of the significant tributaries in the middle and lower portions of the Upper West River watershed. The Tactical Basin Plan (VTDEC, 2021) identified completion of Phase 2 Stream Geomorphic Assessments on these significant tributaries as a priority following Tropical Storm Irene. Two additional significant flooding events occurred within the study area in 2023 (July and December). FEA assessed a total of 42 reaches/segments covering 34 miles within the towns of Townshend, Jamaica, Londonderry, Weston, Landgrove, and Peru. This assessment effort focused on mainstem portions outside of the effect of the numerous large flood control reservoirs and select major tributaries that were not located in confined valleys. One reach on the Winhall River (T11.08) was re-assessed for this study as a “sentinel site”.

The floodplains and river corridors throughout most of the study area have been significantly encroached by roads and development, leaving few locations with accessible floodplains and intact riparian vegetation. These impacts were the primary drivers for reduced rapid habitat and rapid geomorphic ratings. The majority of the study area fell under the “Fair” category for both of these assessments. Channel incision was the dominant geomorphic impact observed throughout the study area. A total of 9 reaches/segments had stream type departures to F-type due to incision, resulting in an “Extreme” sensitivity rating. A high percentage of the river corridor is impacted by human development; therefore the few remaining areas of intact corridor are highly valuable for flood mitigation. In this report, several important floodplains/river corridors

were identified that provide disproportionately high ecosystem services in the way of downstream flood protection. While mapped wetlands and floodplains may prevent encroachment into some of these priority areas, it is recommended that conservation easements be pursued to limit further loss of functioning floodplain in the watershed.

The study area included two large dams on the West River. Both dams store large volumes of sediment and are associated with increased flood damage to adjacent properties. The Williams dam in Londonderry (R22) has been considered for removal with numerous studies conducted both for and against dam removal. Floodwaters back up behind the dam and spill over the banks, with flow continuing west, increasing flooding of the commercial properties along the West River. The historic dam in Weston likely increased flooding impacts along Route 100, which resulted in multiple FEMA buyouts following the 2023 floods.

The study area only included one culvert on Farnum Brook. The culvert was undersized but stable and in good condition. The outlet was perched representing a significant barrier to aquatic organism passage. A total of 33 bridges were assessed on the West River mainstem and tributaries. Many of these structures were replaced following Tropical Storm Irene, resulting in a lower occurrence of significantly undersized structures. A total of 15 bridges had opening widths less than 80% of the predicted bankfull channel width. Many of these were private driveways or farm crossings in the upper reaches of the West River and tributaries. Undersized bridges are less compatible with channel stability and should be considered for upgrade or replacement to reduce flood vulnerability.

The 60 projects identified in Appendix E and 15 high priority projects described in Appendix F are a valuable starting point for prioritizing water quality improvement projects within the West River watershed. Discrete projects such as gully stabilization and stormwater treatment practice implementation would provide immediate reductions in sediment and nutrient loading. Floodplain reconnection projects coupled with corridor easements were identified for many areas along the mainstem and tributaries. Accessible floodplain areas were limited within the study area. Active channel adjustments were observed in most of the tributaries and portions of the upper main stem. Corridor easements are particularly important in these areas to allow for the channel adjustment process. Several areas where buffer planting projects would be beneficial were identified, primarily along agricultural areas. Enhancing and protecting the areas identified in the project list would have significant long-term water quality impacts.

7.0 References

Montgomery, D. R., and J. M. Buffington, 1997, Channel-reach morphology in mountain drainage basins, *Geological Society of America Bulletin*, 109(5), 596-611.

Rosgen, D. L., 1994, A classification of natural rivers, Catena, 22(3), 169 - 199.

Thompson, E.H., and E.R. Sorenson, 2019, Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont, Vermont Department of Fish and Wildlife and The Nature Conservancy.

USGS (Untied States Geological Survey), 2008, Real-time Flow Monitoring Data for Vermont Rivers, available at: http://waterdata.usgs.gov/nwis

VTANR, 2010, Vermont Agency of Natural Resources River Corridor Planning Guide. April, 2010. Available at: http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_restoration.htm

VTANR, 2014, Vermont Agency of Natural Resources - Natural Resource Atlas, available at: http://anrmaps.vermont.gov/websites/anra/

VTDEC (Vermont Department of Environmental Conservation), 2009, Stream Geomorphic Assessment Handbook - Phase 1 & 2 Protocols. Vermont Agency of Natural Resources Publication. Available at: http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassesspro.htm.

8.0 Glossary of Terms

Adapted from:

Restoration Terms, by Craig Fischenich, February, 2000, USAE Research and Development Center, Environmental Laboratory, 3909 Halls Ferry Rd., Vicksburg, MS 39180

And

Vermont Stream Geomorphic Assessment Handbook, 2007, Vermont Agency of Natural Resources, Waterbury, VT http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassesspro.htm

Acre -- A measure of area equal to 43,560 ft ^{2} (4,046.87 m^2). One square mile equals 640 acres.

Adjustment process --or type of change, that is underway due to natural causes or human activity that has or will result in a change to the valley, floodplain, and/or channel condition (e.g., vertical, lateral, or channel plan form adjustment processes)

Aggradation -- A progressive buildup or raising of the channel bed and floodplain due to sediment deposition. The geologic process by which streambeds are raised in elevation and floodplains are formed. Aggradation indicates that stream discharge and/or bed-load characteristics are changing. Opposite of degradation.

Algae -- Microscopic plants that grow in sunlit water containing phosphates, nitrates, and other nutrients. Algae, like all aquatic plants, add oxygen to the water and are important in the fish food chain.

Alluvial -- Deposited by running water.

Alluvium -- A general term for detrital deposits make by streams on riverbeds, floodplains, and alluvial fans; esp. a deposit of silt or silty clay laid down during time of flood. The term applies to stream deposits of recent time. It does not include subaqueous sediments of seas or lakes.

Anadromous -- Pertaining to fish that spend a part of their life cycle in the sea and return to freshwater streams to spawn.

Aquatic ecosystem -- Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.

Armoring -- A natural process where an erosion-resistant layer of relatively large particles is established on the surface of the streambed through removal of finer particles by stream flow. A properly armored streambed generally resists movement of bed material at discharges up to approximately 3/4 bank-full depth. Augmentation (of stream flow) – Increasing flow under normal conditions, by releasing storage water from reservoirs.

Avulsion -- A change in channel course that occurs when a stream suddenly breaks through its banks, typically bisecting an overextended meander arc.

Backwater -- (1) A small, generally shallow body of water attached to the main channel, with little or no current of its own, or (2) A condition in subcritical flow where the water surface elevation is raised by downstream flow impediments.

Backwater pool -- A pool that formed as a result of an obstruction like a large tree, weir, dam, or boulder.

Bank stability -- The ability of a streambank to counteract erosion or gravity forces.

Bankfull channel depth -- The maximum depth of a channel within a riffle segment when flowing at a bank-full discharge.

Bankfull channel width -- The top surface width of a stream channel when flowing at a bank-full discharge.

Bankfull discharge -- The stream discharge corresponding to the water stage that overtops the natural banks. This flow occurs, on average, about once every 1 to 2 years and given its frequency and magnitude is responsible for the shaping of most stream or river channels.

Bankfull width -- The width of a river or stream channel between the highest banks on either side of a stream.

Bar -- An accumulation of alluvium (usually gravel or sand) caused by a decrease in sediment transport capacity on the inside of meander bends or in the center of an overwide channel.

Barrier -- A physical block or impediment to the movement or migration of fish, such as a waterfall (natural barrier) or a dam (man-made barrier).

Base flow -- The sustained portion of stream discharge that is drawn from natural storage sources, and not affected by human activity or regulation.

Bed load -- Sediment moving on or near the streambed and transported by jumping, rolling, or sliding on the bed layer of a stream. See also suspended load.

Bed material -- The sediment mixture that a streambed is composed of.

Bed material load -- That portion of the total sediment load with sediments of a size found in the streambed.

Bed roughness -- A measure of the irregularity of the streambed as it contributes to flow resistance. Commonly expressed as a Manning "n" value.

Bed slope -- The inclination of the channel bottom, measured as the elevation drop per unit length of channel.

Bedform -- Individual patterns which streams follow that characterize the condition of the stream bed into several categories. (*See*: braided, dune-ripple, plane bed, riffle-pool, step-pool, and cascade)

Benthic invertebrates -- Aquatic animals without backbones that dwell on or in the bottom sediments of fresh or salt water. Examples: clams, crayfish, and a wide variety of worms.

Berms -- mounds of dirt, earth, gravel, or other fill built parallel to the stream banks designed to keep flood flows from entering the adjacent floodplain.

Biota -- All living organisms of a region, as in a stream or other body of water.

Boulder -- A large substrate particle that is larger than cobble, between 10 and 160 inches in diameter.

Boundary resistance -- The ability a stream bank has to withstand the erosional forces of the flowing water at varying intensities. Under natural conditions boundary resistance is increased due to stream bank vegetation (roots), cohesive clays, large boulder substrate, etc.

Braided -- A stream channel characterized by flow within several channels, which successively meet and divide. Braiding often occurs when sediment loading is too large to be carried by a single channel.

Braiding (of river channels) -- Successive division and rejoining of riverflow with accompanying islands.

Buffer strip -- A barrier of permanent vegetation, either forest or other vegetation, between waterways and land uses such as agriculture or urban development, designed to intercept and filter out pollution before it reaches the surface water resource.

Canopy -- A layer of foliage in a forest stand. This most often refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multistoried stand. Leaves, branches and vegetation that are above ground and/or water that provide shade and cover for fish and wildlife.

Cascade -- A short, steep drop in streambed elevation often marked by boulders and agitated white water.

Catchment -- (1) The catching or collecting of water, especially rainfall. (2) A reservoir or other basin for catching water. (3) The water thus caught. (4) A watershed.

Channel -- An area that contains continuously or periodically flowing water that is confined by banks and a streambed.

Channelization -- The process of changing (usually straightening) the natural path of a waterway.

Channel evolution model (CEM) -- A series of stages used to describe the erosional or depositional processes that occur within a stream or river in order to regain a dynamic equilibrium following a disturbance.

Clay -- Substrate particles that are smaller than silt and generally less than 0.0001 inches in diameter.

Coarse gravel -- Substrate that is smaller than cobble, but larger than fine gravel. The diameter of this stream-bottom particulate is between 0.63 and 2.5 inches.

Cobble -- Substrate particles that are smaller than boulders and larger than gravels, and are generally between 2.5 and 10 inches in diameter.

Confinement -- *see* Valley confinement

Confluence -- (1) The act of flowing together; the meeting or junction of two or more streams; also, the place where these streams meet. (2) The stream or body of water formed by the junction of two or more streams; a combined flood.

Conifer -- A tree belonging to the order Gymnospermae, comprising a wide range of trees that are mostly evergreens. Conifers bear cones (hence, coniferous) and have needle-shaped or scalelike leaves.

Conservation -- The process or means of achieving recovery of viable populations.

Contiguous habitat -- Habitat suitable to support the life needs of a species that is distributed continuously or nearly continuously across the landscape.

Cover -- "cover" is the general term used to describe any structure that provides refuge for fish, reptiles or amphibians. These animals seek cover to hide from predators, to avoid warm water temperatures, and to rest, by avoiding higher velocity water. These animals come in all sizes, so even cobbles on the stream bottom that are not sedimented in with fine sands and silt can serve as cover for small fish and salamanders. Larger fish and reptiles often use large boulders, undercut banks, submerged logs, and snags for cover.

Critical shear stress -- The minimum amount of shear stress exerted by stream currents required to initiate soil particle motion. Because gravity also contributes to streambank particle movement but not on streambeds, critical shear stress along streambanks is less than for streambeds.]

Cross-section -- A series of measurements, relative to bankfull, that are taken across a stream channel that are representative of the geomorphic condition and stream type of the reach.

Crown -- The upper part of a tree or other woody plant that carries the main system of branches and the foliage.

Crown cover -- The degree to which the crowns of trees are nearing general contact with one another.

Cubic feet per second (cfs) -- A unit used to measure water flow. One cubic foot per second is equal to 449 gallons per minute.

Culvert -- A buried pipe that allows flows to pass under a road.

Debris flow -- A rapidly moving mass of rock fragments, soil, and mud, with more than half of the particles being larger than sand size.

Deciduous -- Trees and plants that shed their leaves at the end of the growing season.

Degradation -- (1) A progressive lowering of the channel bed due to scour. Degradation is an indicator that the stream's discharge and/or sediment load is changing. The opposite of aggradation. (2) A decrease in value for a designated use.

Detritus -- is organic material, such as leaves, twigs, and other dead plant matter, that collects on the stream bottom. It may occur in clumps, such as leaf packs at the bottom of a pool, or as single pieces, such as a fallen tree branch.

Dike -- (1) (Engineering) An embankment to confine or control water, especially one built along the banks of a river to prevent overflow of lowlands; a levee. (2) A low wall that can act as a barrier to prevent a spill from spreading. (3) (Geology) A tabular body of igneous (formed by volcanic action) rock that cuts across the structure of adjacent rocks or cuts massive rocks.

Dissolved oxygen (DO) -- The amount of free (not chemically combined) oxygen dissolved in water, wastewater, or other liquid, usually expressed in milligrams per liter, parts per million, or percent of saturation.

Ditch -- A long narrow trench or furrow dug in the ground, as for irrigation, drainage, or a boundary line.

Drainage area -- The total surface area upstream of a point on a stream that drains toward that point. Not to be confused with watershed. The drainage area may include one or more watersheds.

Drainage basin -- The total area of land from which water drains into a specific river.

Dredging -- Removing material (usually sediments) from wetlands or waterways, usually to make them deeper or wider.

Dune-ripple -- A bedform associated with low-gradient, sand-bed channels; the low gradient nature of the channel causes the sand to form a sequence of dunes and small ripples; significant sediment transport typically occurs at most stream stages.

Ecology -- The study of the interrelationships of living organisms to one another and to their surroundings.

Ecosystem -- Recognizable, relatively homogeneous units, including the organisms they contain, their environment, and all the interactions among them.

Embankment -- An artificial deposit of material that is raised above the natural surface of the land and used to contain, divert, or store water, support roads or railways, or for other similar purposes.

Embeddedness -- is a measure of the amount of surface area of cobbles, boulders, snags and other stream bottom structures that is covered with sand and silt. An embedded streambed may be packed hard with sand and silt such that rocks in the stream bottom are difficult or impossible to pick up. The spaces between the rocks are filled with fine sediments, leaving little room for fish, amphibians, and bugs to use the structures for cover, resting, spawning, and feeding. A streambed that is not embedded has loose rocks that are easily removed from the stream bottom, and may even "roll" on one another when you walk on them.

Entrenchment ratio --The width of the flood-prone area divided by the bankfull width.

Epifaunal – "epi" means surface, and "fauna" means animals. Thus, "epifaunal substrate" is structures in the stream (on the stream bed) that provide surfaces on which animals can live. In this case, the animals are aquatic invertebrates (such as aquatic insects and other "bugs"). These bugs live on or under cobbles, boulders, logs, and snags, and the many cracks and crevices found in these structures. In general, older decaying logs are better suited for bugs to live on/in than newly fallen "green" logs and trees.

Ephemeral streams -- Streams that flow only in direct response to precipitation and whose channel is at all times above the water table.

Equilibrium Condition -- The state of a river reach in which the upstream input of energy (flow of water) and materials (sediment and debris) is equal to its output to downstream reaches. Natural river reaches without human impacts tend towards a "stable" state where predictable channel forms are maintained over the long term under varying flow conditions.

Erosion -- Wearing away of rock or soil by the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical, chemical, or biological forces.

Eutrophic -- Usually refers to a nutrient-enriched, highly productive body of water.

Eutrophication -- The process of enrichment of water bodies by nutrients.

Fine gravel -- Is substrate which is larger than sand, but smaller than coarse gravel. It is between 0.08 and 0.63 inches in diameter.

Flash flood -- A sudden flood of great volume, usually caused by a heavy rain. Also, a flood that crests in a short length of time and is often characterized by high velocity flows.

Floodplain -- Land built of fine particulate organic matter and small substrate that is regularly covered with water as a result of the flooding of a nearby stream.

Floodplain (100-year) -- The area adjacent to a stream that is on average inundated once a century.

Floodplain Function – Flood water access of floodplain which effects the velocity, depth, and slope (stream power) of the flood flow thereby influencing the sediment transport characteristics of the flood (i.e., loss of floodplain access and function may lead to higher stream power and erosion during flood).

Flow -- The amount of water passing a particular point in a stream or river, usually expressed in cubic feet per second (cfs).

Fluvial -- Migrating between main rivers and tributaries. Of or pertaining to streams or rivers.

Fluvial Geomorphology—The study of how rivers and their landforms interact over time through different climatic conditions.

Ford -- A shallow place in a body of water, such as a river, where one can cross by walking or riding on an animal or in a vehicle.

Fry -- A recently hatched fish.

Gabion -- A wire basket or cage that is filled with gravel or cobble and generally used to stabilize streambanks.

Gaging station -- A particular site in a stream, lake, reservoir, etc., where hydrologic data are obtained.

Gallons per minute (gpm) -- A unit used to measure water flow.

Geographic information system (GIS) -- A computer system capable of storing and manipulating spatial data.

Geomorphology -- A branch of both physiography and geology that deals with the form of the earth, the general configuration of its surface, and the changes that take place due to erosion of the primary elements and the buildup of erosional debris.

Glide -- A section of stream that has little or no turbulence.

Grade control -- A fixed feature on the streambed that controls the bed elevation at that point, effectively fixing the bed elevation from potential incision; typically bedrock, dams. or culverts.

Gradient -- Vertical drop per unit of horizontal distance.

Grass/forb -- Herbaceous vegetation.

Gravel -- An unconsolidated natural accumulation of rounded rock fragments, mostly of particles larger than sand (diameter greater than 2 mm), such as boulders, cobbles, pebbles, granules, or any combination of these.

Groundwater -- Subsurface water and underground streams that can be collected with wells, or that flow naturally to the earth's surface through springs.

Groundwater basin -- A groundwater reservoir, defined by an overlying land surface and the underlying aquifers that contain water stored in the reservoir. In some cases, the boundaries of successively deeper aquifers may differ and make it difficult to define the limits of the basin.

Groundwater recharge -- Increases in groundwater storage by natural conditions or by human activity. See also artificial recharge.

Groundwater Table -- The upper surface of the zone of saturation, except where the surface is formed by an impermeable body.

Habitat -- The local environment in which organisms normally live and grow.

Habitat diversity -- The number of different types of habitat within a given area.

Habitat fragmentation -- The breaking up of habitat into discrete islands through modification or conversion of habitat by management activities.

Headcut -- A sharp change in slope, almost vertical, where the streambed is being eroded from downstream to upstream.

Headwater -- Referring to the source of a stream or river.

High gradient streams -- typically appear as steep cascading streams, step/pool streams, or streams that exhibit riffle/pool sequences. Most of the streams in Vermont are high gradient streams.

Hydraulic gradient -- The slope of the water surface. See also streambed gradient.

Hydraulic radius -- The cross-sectional area of a stream divided by the wetted perimeter.

Hydric -- oil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper horizon.

Hydrograph -- A curve showing stream discharge over time.

Hydrologic balance -- An accounting of all water inflow to, water outflow from, and changes in water storage within a hydrologic unit over a specified period of time. Hydrologic region -- A study area, consisting of one or more planning subareas, that has a common hydrologic character.

Hydrologic unit Code (HUC) -- A distinct watershed or river basin defined by an 8-digit code.

Hydrology -- The scientific study of the water of the earth, its occurrence, circulation and distribution, its chemical and physical properties, and its interaction with its environment, including its relationship to living things.

Hyporheic zone -- The area under the stream channel and floodplain where groundwater and the surface waters of the stream are exchanged freely.

Impoundment -- An area where the natural flow of the river has been disrupted by the presence of human-made or natural structure (e.g. weir or beaver dam). The impoundment backwater extends upstream causing sediment to be deposited on the stream bottom.

Improved paths – Paths that are maintained and typically involve paved, gravel or macadam surfaces.

Incised river -- A river that erodes its channel by the process of degradation to a lower base level than existed previously or is consistent with the current hydrology.

Incision ratio -- The low bank height divided by the bankfull maximum depth.

Infiltration (soil) -- The movement of water through the soil surface into the soil.

Inflow -- Water that flows into a stream, lake,

Instream cover -- The layers of vegetation, like trees, shrubs, and overhanging vegetation, that are in the stream or immediately adjacent to the wetted channel.

Instream flows -- (1) Portion of a flood flow that is contained by the channel. (2) A minimum flow requirement to maintain ecological health in a stream.

Instream use -- Use of water that does not require diversion from its natural watercourse. For example, the use of water for navigation, recreation, fish and wildlife, aesthetics, and scenic enjoyment.

Intermittent stream -- Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Irrigation diversion -- Generally, a ditch or channel that deflects water from a stream channel for irrigation purposes.

Islands -- mid-channel bars that are above the average water level and have established woody vegetation.

Kame – a deposit of stratified glacial drift in isolated mounds or steep-sided hills.

Lake -- An inland body of standing water deeper than a pond, an expanded part of a river, a reservoir behind a dam

Landslide -- A movement of earth mass down a steep slope.

Large woody debris (LWD) -- Pieces of wood at least 6 ft. long and 1 ft. in diameter (at the large end) contained, at least partially, within the bankfull area of a channel.

Levee -- An embankment constructed to prevent a river from overflowing (flooding).

Limiting factor -- A requirement such as food, cover, or another physical, chemical, or biological factor that is in shortest supply with respect to all resources necessary to sustain life and thus "limits" the size or retards production of a population.

Low gradient -- streams typically appear slow moving and winding, and have poorly defined riffles and pools.

Macroinvertebrate -- Invertebrates visible to the naked eye, such as insect larvae and crayfish.

Macrophytes -- Aquatic plants that are large enough to be seen with the naked eye.

Main Stem -- The principal channel of a drainage system into which other smaller streams or rivers flow.

Mass movement -- The downslope movement of earth caused by gravity. Includes but is not limited to landslides, rock falls, debris avalanches, and creep. It does not however, include surface erosion by running water. It may be caused by natural erosional processes, or by natural disturbances (e.g., earthquakes or fire events) or human disturbances (e.g., mining or road construction).

Mean annual discharge -- Daily mean discharge averaged over a period of years. Mean annual discharge generally fills a channel to about one-third of its bank-full depth.

Mean velocity -- The average cross-sectional velocity of water in a stream channel. Surface values typically are much higher than bottom velocities. May be approximated in the field by multiplying the surface velocity, as determined with a float, times 0.8.

Meander -- The winding of a stream channel, usually in an erodible alluvial valley. A series of sine-generated curves characterized by curved flow and alternating banks and shoals.

Meander amplitude -- The distance between points of maximum curvature of successive meanders of opposite phase in a direction normal to the general course of the meander belt, measured between center lines of channels.

Meander belt width -- the distance between lines drawn tangential to the extreme limits of fully developed meanders. Not to be confused with meander amplitude.

Meander length -- The lineal distance down valley between two corresponding points of successive meanders of the same phase.

Mid-channel Bars – bars located in the channel away from the banks, generally found in areas where the channel runs straight. Mid-channel bars caused by recent channel instability are unvegetated.

Milligrams per liter (mg/l) -- The weight in milligrams of any substance dissolved in 1 liter of liquid; nearly the same as parts per million by weight.

Moraine – a mass of till either carried by an active glacier or deposited on the land after a glacier recedes.

Natural flow -- The flow past a specified point on a natural stream that is unaffected by stream diversion, storage, import, export, return flow, or change in use caused by modifications in land use.

Neck cutoff -- A channel migration feature where the land that separates a meander bend is cut off by the lateral migration of the channel. This process may be part of the equilibrium regime or associated with channel instability.

Outfall -- The mouth or outlet of a river, stream, lake, drain or sewer.

Outwash – water-transported material carried away from the ablation zone of a melting glacier.

Oxbow -- An abandoned meander in a river or stream, caused by cutoff. Used to describe the U-shaped bend in the river or the land within such a bend of a river.

Peat -- Partially decomposed plants and other organic material that build up in poorly drained wetland habitats.

Perched groundwater -- Groundwater supported by a zone of material of low permeability located above an underlying main body of groundwater with which it is not hydrostatically connected.

Perennial streams -- Streams that flow continuously.

Permeability -- The capability of soil or other geologic formations to transmit water.

pH -- The negative logarithm of the molar concentration of the hydrogen ion, or, more simply acidity.

Planform -- The channel shape as if observed from the air. Changes in planform often involve shifts in large amount of sediment, bank erosion, or the migration of the channel. A channel straightened for agricultural purposes has a highly impacted planform.

Point bar -- The convex side of a meander bend that is built up due to sediment deposition.

Pond -- A body of water smaller than a lake, often artificially formed.

Pool -- A reach of stream that is characterized by deep, low-velocity water and a smooth surface.

Potential plant height -- the height to which a plant, shrub or tree would grow if undisturbed.

Probability of exceedance -- The probability that a random flood will exceed a specified magnitude in a given period of time.

Railroads – Used or unused railroad infrastructure.

Rapids -- A reach of stream that is characterized by small falls and turbulent, high-velocity water.

Reach -- A section of stream having relatively uniform physical attributes, such as valley confinement, valley slope, sinuosity, dominant bed material, and bed form, as determined in the Phase 1 assessment.

Rearing habitat -- Areas in rivers or streams where juvenile fish find food and shelter to live and grow.

Reference stream type --Uses preliminary observations to determine the natural channel form and process that would be present in the absence of anthropogenic impacts to the channel and the surrounding watershed.

Refuge area -- An area within a stream that provides protection to aquatic species during very low and/or high flows.

Regime theory -- A theory of channel formation that applies to streams that make a part of their boundaries from their transported sediment load and a portion of their transported sediment load from their boundaries. Channels are considered in regime or equilibrium when bank erosion and bank formation are equal.

Restoration -- The return of an ecosystem to a close approximation of its condition prior to disturbance.

Riffle -- A reach of stream that is characterized by shallow, fast-moving water broken by the presence of rocks and boulders.

Riffle-pool ratio -- The ratio of surface area or length of pools to the surface area or length of riffles in a given stream reach; frequently expressed as the relative percentage of each category. Used to describe fish habitat rearing quality.

Riffle-step ratio-- ratio of the distance between riffles to the stream width.

Riparian area -- An area of land and vegetation adjacent to a stream that has a direct effect on the stream. This includes woodlands, vegetation, and floodplains. Riparian buffer is the width of naturally vegetated land adjacent to the stream between the top of the bank (or top of slope, depending on site characteristics) and the edge of other land uses. A buffer is largely undisturbed and consists of the trees, shrubs, groundcover plants, duff layer, and naturally uneven ground surface. The buffer serves to protect the water body from the impacts of adjacent land uses. Riparian corridor includes lands defined by the lateral

extent of a stream's meanders necessary to maintain a stable stream dimension, pattern, profile, and sediment regime. For instance, in stable pool-riffle streams, riparian corridors may be as wide as 10-12 times the channel's bankfull width. In addition the riparian corridor typically corresponds to the land area surrounding and including the stream that supports (or could support if unimpacted) a distinct ecosystem, generally with abundant and diverse plant and animal communities (as compared with upland communities).

Riparian habitat -- The aquatic and terrestrial habitat adjacent to streams, lakes, estuaries, or other waterways.

Riparian -- Located on the banks of a stream or other body of water.

Riparian vegetation -- The plants that grow adjacent to a wetland area such as a river, stream, reservoir, pond, spring, marsh, bog, meadow, etc., and that rely upon the hydrology of the associated water body.

Ripple -- (1) A specific undulated bed form found in sand bed streams. (2) Undulations or waves on the surface of flowing water.

Riprap -- Rock or other material with a specific mixture of sizes referred to as a "gradation," used to stabilize streambanks or riverbanks from erosion or to create habitat features in a stream.

River channels --Large natural or artificial open streams that continuously or periodically contain moving water, or which form a connection between two bodies of water.

River miles --Generally, miles from the mouth of a river to a specific destination or, for upstream tributaries, from the confluence with the main river to a specific destination.

River reach -- Any defined length of a river.

River stage -- The elevation of the water surface at a specified station above some arbitrary zero datum (level).

Riverine -- Relating to, formed by, or resembling a river including tributaries, streams, brooks, etc.

Riverine habitat -- The aquatic habitat within streams and rivers.

Roads -- Transportation infrastructure. Includes private, town, state roads, and roads that are dirt, gravel, or paved.

Rock -- A naturally formed mass of minerals.

Rootwad -- The mass of roots associated with a tree adjacent to or in a stream that provides refuge for fish and other aquatic life.

Run (in stream or river) -- A reach of stream characterized by fast-flowing, low-turbulence water.

Runoff -- Water that flows over the ground and reaches a stream as a result of rainfall or snowmelt.

Sand -- Small substrate particles, generally from 0.002 to 0.08 in diameter. Sand is larger than silt and smaller than gravel.

Scour -- The erosive action of running water in streams, which excavates and carries away material from the bed and banks. Scour may occur in both earth and solid rock material and can be classed as general, contraction, or local scour.

Sediment -- Soil or mineral material transported by water or wind and deposited in streams or other bodies of water.

Sedimentation -- (1) The combined processes of soil erosion, entrainment, transport, deposition, and consolidation. (2) Deposition of sediment.

Seepage -- The gradual movement of a fluid into, through, or from a porous medium. Segment: A relatively homogenous section of stream contained within a reach that has the same reference stream characteristics but is distinct from other segments in the reach in one or more of the following parameters: degree of floodplain encroachment, presence/absence of grade controls, bankfull channel dimensions (W/D ratio, entrenchment), channel sinuosity and slope, riparian buffer and corridor conditions, abundance of springs/seeps/adjacent wetlands/stormwater inputs, and degree of channel alterations.

Sensitivity -- of the valley, floodplain, and/or channel condition to change due to natural causes and/or anticipated human activity.

Shoals -- unvegetated deposits of gravels and cobbles adjacent to the banks that have a height less than the average water level. In channels that are over-widened, the stream does not have the power to transport these larger sediments, and thus they are deposited throughout the channel as shoals.

Silt -- Substrate particles smaller than sand and larger than clay; between 0.0001 and 0.002 inches in diameter.

Siltation -- The deposition or accumulation of fine soil particles.

Sinuosity -- The ratio of channel length to direct down-valley distance. Also may be expressed as the ratio of down-valley slope to channel slope.

Slope -- The ratio of the change in elevation over distance.

Slope stability -- The resistance of a natural or artificial slope or other inclined surface to failure by mass movement.

Snag -- Any standing dead, partially dead, or defective (cull) tree at least 10 in. in diameter at breast height and at least 6 ft tall. Snags are important riparian habitat features.

Spawning -- The depositing and fertilizing of eggs (or roe) by fish and other aquatic life.

Spillway -- A channel for reservoir overflow.

Stable channel -- A stream channel with the right balance of slope, planform, and cross section to transport both the water and sediment load without net long-term bed or bank sediment deposition or erosion throughout the stream segment.

Stone -- Rock or rock fragments used for construction.

Straightening -- the removal of meander bends, often done in towns and along roadways, railroads, and agricultural fields.

Stream -- A general term for a body of water flowing by gravity; natural watercourse containing water at least part of the year. In hydrology, the term is generally applied to the water flowing in a natural narrow channel as distinct from a canal. Stream banks are features that define the channel sides and contain stream flow within the channel; this is the portion of the channel bank that is between the toe of the bank slope and the bankfull elevation. The banks are distinct from the streambed, which is normally wetted and provides a substrate that supports aquatic organisms. The top of bank is the point where an abrupt change in slope is evident, and where the stream is generally able to overflow the banks and enter the adjacent floodplain during flows at or exceeding the average annual high water.

Stream channel -- A long narrow depression shaped by the concentrated flow of a stream and covered continuously or periodically by water.

Stream condition -- Given the land use, channel and floodplain modifications documented at the assessment sites, the current degree of change in the channel and floodplain from the reference condition for parameters such as dimension, pattern, profile, sediment regime, and vegetation.

Stream gradient -- A general slope or rate of change in vertical elevation per unit of horizontal distance of the bed, water surface, or energy grade of a stream.

Stream morphology -- The form and structure of streams.

Stream order -- A hydrologic system of stream classification. Each small unbranched tributary is a first-order stream. Two first-order streams join to make a second-order stream. A third-order stream has only first-and second-order tributaries, and so forth.

Stream reach -- An individual segment of stream that has beginning and ending points defined by identifiable features such as where a tributary confluence changes the channel character or order.

Stream type -- Gives the overall physical characteristics of the channel and helps predict the reference or stable condition of the reach.

Stream type departure -- When the current stream type differs from the reference stream type as a response to anthropogenic or severe natural disturbances. These departures are often characterized by large-scale incision, deposition, or changes in planform.

Streambank armoring – The installation of concrete walls, gabions, stone riprap, and other large erosion resistant material along stream banks.

Streambank erosion -- The removal of soil from streambanks by flowing water.

Streambank stabilization -- The lining of streambanks with riprap, matting, etc., or other measures intended to control erosion.

Streambed -- (1) The unvegetated portion of a channel boundary below the baseflow level. (2) The channel through which a natural stream of water runs or used to run, as a dry streambed.

Streamflow -- The rate at which water passes a given point in a stream or river, usually expressed in cubic feet per second (cfs).

Step (in a river system) --A step is a steep, step-like feature in a high gradient stream (> 2%). Steps are composed of large boulders lines across the stream. Steps are important for providing grade-control, and for dissipating energy. As fast-shallow water flows over the steps it takes various flow paths thus dissipating energy during high flow events.

Substrate -- (1) The composition of a streambed, including either mineral or organic materials. (2) Material that forms an attachment medium for organisms.

Surface erosion -- The detachment and transport of soil particles by wind, water, or gravity. Or a group of processes whereby soil materials are removed by running water, waves and currents, moving ice, or wind.

Surface water -- All waters whose surface is naturally exposed to the atmosphere, for example, rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc., and all springs, wells, or other collectors directly influenced by surface water.

Suspended sediment -- Sediment suspended in a fluid by the upward components of turbulent currents, moving ice, or wind.

Suspended sediment load -- That portion of a stream's total sediment load that is transported within the body of water and has very little contact with the streambed.

Tailwater -- (1) The area immediately downstream of a spillway. (2) Applied irrigation water that runs off the end of a field.

Thalweg -- (1) The lowest thread along the axial part of a valley or stream channel. (2) A subsurface, groundwater stream percolating beneath and in the general direction of a surface stream course or valley. (3) The middle, chief, or deepest part of a navigable channel or waterway.

Tractive Force --The drag on a streambed or bank caused by passing water, which tends to pull soil particles along with the streamflow.

Transpiration -- An essential physiological process in which plant tissues give off water vapor to the atmosphere.

Tributary -- A stream that flows into another stream, river, or lake.

Turbidity -- A measure of the content of suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. Suspended sediments are only one component of turbidity.

Urban runoff -- Storm water from city streets and gutters that usually carries a great deal of litter and organic and bacterial wastes into the sewer systems and receiving waters.

Valley confinement -- Referring to the ratio of valley width to channel width. Unconfined channels (confinement of 4 or greater) flow through broader valleys and typically have higher sinuosity and area for floodplain. Confined channels (confinement of less than 4) typically flow through narrower valleys.

Valley wall -- The side slope of a valley, which begins where the topography transitions from the gentle-sloped valley floor. The distance between valley walls is used to calculate the valley confinement.

Variable-stage stream -- Stream flows perennially but water level rises and falls significantly with storm and runoff events.

Velocity -- In this concept, the speed of water flowing in a watercourse, such as a river.

Washout -- (1) Erosion of a relatively soft surface, such as a roadbed, by a sudden gush of water, as from a downpour or floods. (2) A channel produced by such erosion.

Water quality -- A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.

Waterfall -- A sudden, nearly vertical drop in a stream, as it flows over rock.

Watershed -- An area of land whose total surface drainage flows to a single point in a stream.

Watershed management -- The analysis, protection, development, operation, or maintenance of the land, vegetation, and water resources of a drainage basin for the conservation of all its resources for the benefit of its residents.

Watershed project -- A comprehensive program of structural and nonstructural measures to preserve or restore a watershed to good hydrologic condition. These measures may include detention reservoirs, dikes, channels, contour trenches, terraces, furrows, gully plugs, revegetation, and possibly other practices to reduce flood peaks and sediment production.

Watershed restoration -- Improving current conditions of watersheds to restore degraded habitat and provide long-term protection to aquatic and riparian resources.

Weir -- A structure to control water levels in a stream. Depending upon the configuration, weirs can provide a specific "rating" for discharge as a function of the upstream water level.

Wetland -- Areas adjacent to, or within the stream, with sufficient surface/groundwater influence to have present hydric soils and aquatic vegetation (e.g. cattails, sedges, rushes, willows or alders).

Width/depth ratio -- The ratio of channel bankfull width to the average bankfull depth. An indicator of channel widening or aggradation, and used for stream type classification.

APPENDIX A:

Phase 2 Stream Geomorphic Assessment Data

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R10-A**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **impounded**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	**0**			
Road:	**0**			
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**10**			

1.4 Adjacent Side — Left — Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **West River** Reach: **R10-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):
2.2 Max Depth (ft.):
2.3 Mean Depth (tf):
2.4 Floodprone Width (ft.):
2.5 Aband. Floodpn (ft.):
Human Elev FloodPln (ft.):
2.6 Width/Depth Ratio: **0.00**
2.7 Entrenchment Ratio: **0.00**
2.8 Incision Ratio: **0.00**
Human Elevated Inc. Rat.: **0.00**
2.9 Sinuosity:
2.10 Riffles Type:

2.11 Riffle/Step Spacing:
2.12 Substrate Composition
Bedrock: **%**
Boulder: **%**
Cobble: **%**
Coarse Gravel: **%**
Fine Gravel: **%**
Sand: **%**
Silt and Smaller: **%**
Silt/Clay Present:
Detritus: **%**
Large Woody Debris:

2.13 Average Largest Particle on
Bed:
Bar:
2.14 Stream Type
Stream Type:
Bed Material:
Subclass Slope:
Bed Form:
Field Measured Slope:
2.15 Sub-reach Stream Type
Reference Stream Type:
Reference Bed Material:
Reference Subclass Slope:
Reference Bedform:

Step 3. Riparian Features

3.1 Stream Banks
Bank Texture
Upper — Left — Right
Material Type:
Consistency:
Lower
Material Type:
Consistency:

Typical Bank Slope:

Bank Erosion	Left	Right
Erosion Length (ft.):	**0.0**	**0.0**
Erosion Height (ft.):	**0.0**	**0.0**
Revetment Type:	**None**	**None**
Revetment Length:	**0.0**	**0.0**

Near Bank Vegetation Type	Left	Right
Dominant:		
Sub-dominant:		

Bank Canopy
Canopy %:
Mid-Channel Canopy:

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25	**0**	**0**

Buffer Vegitation Type
Dominant
Sub-Dominant

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant		
Sub-dominant		
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R10-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.:

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**

Field Ditch: Road Ditch:

Other: Tile Drain:

Overland Flow: Urb Strm Wtr Pipe:

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal:

Mid: Delta:

Point: Island:

Side: Braiding: **0**

5.2 Other Features

Neck Cutoff: **0**

Flood chutes: **0**

Avulsion: **0**

5.3 Steep Riffles and Head Cuts

Head Cuts: **0**

Steep Riffles: **0**

Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **None**

Straightening Length (ft.): **0**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating

Channel Evolution Model

Channel Evolution Stage

Geomorphic Condition

Stream Sensitivity

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R10-B**
Segment Length(ft): **7,032**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: **8/15/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 30 from Worden Lane to where the water begins to be impounded north of the Townshend dam.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically incised and shows evidence of significant active aggradation and widening. Segment is likely tail-watered by Townshend dam at high flows. There are high sediment inputs from Wardsboro Brook upstream.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Flow Status**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	0		
Road:	608	6	
Railroad:	0		
Imp. Path:	0		
Dev.:	999		

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Steep**	**Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **1,542**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **West River** Reach: **R10-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**156.00**	2.11 Riffle/Step Spacing:	**600 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.50**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**3.37**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**165.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**10.70**	Cobble:	**55.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**46.29**	Fine Gravel:	**4.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.06**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.38**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**14**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**883.5**	**990.9**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**8.5**	**9.0**	Sub-dominant:	**Shrubs/Sapling**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**389.2**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**None**
W less than 25	**379**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**25.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R10-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:		Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**15**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**B to F**	**Yes**	Geomorphic Rating	**0.39**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**31**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R11-0**
Segment Length(ft): **5,570**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: **8/15/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 30 from the confluence with Wardsboro Brook to Worden Ln.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically incised and and is actively aggrading and widening. There are high sediment inputs from Wardsboro Brook. A very large delta bar is present at the mouth of Wardsboro Brook.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		**0**			
Road:		**0**			
Railroad:		**0**			
Imp. Path:		**0**			
Dev.:		**2,047**			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Extr.Steep**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Never**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft):	**1,034**
Width Determination:	**Measured**
Confinement Type:	**BD**
In Rock Gorge:	**No**
Human Caused Change in Valley Width?:	**No**

1.6 Grade Controls:

Stream: **West River** Reach: **R11-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**189.00**	2.11 Riffle/Step Spacing:	**500 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.20**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**1.83**	Bedrock:	**0.0 %**	Bar:	**350**	**mm**
2.4 Floodprone Width (ft.):	**240.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**8.00**	Cobble:	**37.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**47.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**103.28**	Fine Gravel:	**6.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.27**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.90**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**15**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**669.3**	**220.2**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**3.6**	**4.0**	Sub-dominant:	**None**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**51-100**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**Industrial**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R11-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:	**1**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:		Island:	**1**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**3**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.39**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**31**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R12-0**
Segment Length(ft): **2,498**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: **8/16/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the confluence with Turkey Mountain Brook to the the confluence with Wardsboro brook.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically incised with evidence of active aggradation from numerous large bar deposits of cobble material. Minimal erosion or migration indicates that the reach is aggrading but not actively widening. .**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	632	10	1,711	15
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,278		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Very Steep**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Never**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features	
Valley Width (ft):	**702**
Width Determination:	**Measured**
Confinement Type:	**NW**
In Rock Gorge:	**No**

Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R12-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**156.00**	2.11 Riffle/Step Spacing:	**600 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.24**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**215.00**	Boulder:	**9.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.00**	Cobble:	**53.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**26.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**69.64**	Fine Gravel:	**1.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.38**	Sand:	**6.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.33**	Silt and Smaller:	**5.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:		Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**51-100**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Hay**	**Residential**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R12-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**		
Mid:	**2**	Delta:	**1**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R13-A**
Segment Length(ft): **4,014**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: **8/16/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the VT 30 bridge to the confluence with Turkey Mountain Brook**

Step 5 - Notes:

Step 7 - Narrative: **The channel is wide and shallow with signs of active aggradation and some widening. There is a large flood chute from the Ball Mountain Brook delta to just upstream of the manufactured housing units along Route 100. This may account fir the reduced main channel width in segment B.**

From the manufactured housing units to the downstream end of the segment there is encroachment and extensive bank stabilization. There are high sediment loads from Ball Mountain Brook and a large delta bar at the confluence.

Step 1. Valley and Floodplain

1.1 Segmentation: **Corridor Encroachment**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	2,557	12	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	691		394	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	1,088
Width Determination:	Measured
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Stream: **West River** Reach: **R13-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**117.00**	2.11 Riffle/Step Spacing:	**750 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.50**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.70**	Bedrock:	**0.0 %**	Bar:	**450**	**mm**
2.4 Floodprone Width (ft.):	**800.00**	Boulder:	**8.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.80**	Cobble:	**40.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**31.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**43.33**	Fine Gravel:	**15.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**6.84**	Sand:	**6.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.37**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**166.1**	**161.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**4.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**87**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R13-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:		Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**650**
Side:	**7**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R13-B**
Segment Length(ft): **11,243**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC, RS**
Completion Date: **10/19/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the Depot Street bridge to the VT 30 bridge.**

Step 5 - Notes:

Step 7 - Narrative: **Channel is moderately incised (historic) with active aggradation and limited evidence of widening.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,734	11	1,058	16
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,120		3,034	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Hilly
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **1,255**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Stream: **West River** Reach: **R13-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**91.00**	2.11 Riffle/Step Spacing:	**1000 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.60**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**2.53**	Bedrock:	**0.0 %**	Bar:	**260**	**mm**
2.4 Floodprone Width (ft.):	**260.00**	Boulder:	**11.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.80**	Cobble:	**62.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**22.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**35.97**	Fine Gravel:	**3.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.86**	Sand:	**2.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.61**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	**1**	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**23**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Coniferous**	**Coniferous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**374.5**	**746.8**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**115**	**2,249**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R13-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**7**	Delta:		Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**2,433**
Side:	**9**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**None**	**Yes**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**Yes**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**37**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R18-0**
Segment Length(ft): **10,348**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB/RS**
Completion Date: **9/22/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the confluence with T12 to the confluence with the Winhall River.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is very straight, potentially naturally so, and has very limited access to narrow floodplain benches. Coarse substrate and potentially some underlying grade control limit future incision. The channel has limited space to adjust planform or aggrade**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**3,759**	**9**	
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**146**		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Very Steep**	**Very Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **360**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **West River** Reach: **R18-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**112.00**	2.11 Riffle/Step Spacing:	**750 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.00**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.96**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**136.00**	Boulder:	**18.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**51.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**20.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**37.84**	Fine Gravel:	**1.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.21**	Sand:	**9.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.75**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**9**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**207.9**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**6.0**	**0.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**457.6**	**0.0**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**764**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**Commercial**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R18-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**8**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**13**
Side: **4**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**B to F**	**Yes**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**37**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.01-0**
Segment Length(ft): **977**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Also known as Thompsonburg Brook. Along Thompsonburg Road to confluence with West River**

Step 5 - Notes:

Step 7 - Narrative: **The reach is moderately incised, but appears stable with no evidence of active widening, incision, or planform adjustment. Coarse substrate was observed for most of the bed and banks and nice step pool sequences in the lower portion and riffle pool in the upper portion. The reach appears stable.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**				
Road:	**920**	**5**			
Railroad:	**0**				
Imp. Path:	**0**				
Dev.:	**0**				

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Very Steep**	**Very Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Always**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **118**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**2.5**	**1.0**	**No**	**No**

Stream: **Trib 12 to West River** Reach: **T12.01-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**21.20**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**400 mm**
2.3 Mean Depth (tf):	**1.70**	Bedrock:	**0.0 %**	Bar:	**200 mm**
2.4 Floodprone Width (ft.):	**36.00**	Boulder:	**27.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**4.05**	Cobble:	**35.0 %**	Stream Type:	**B**
Human Elev FloodPln (ft.):		Coarse Gravel:	**19.0 %**	Bed Material:	**Cobble**
2.6 Width/Depth Ratio:	**12.47**	Fine Gravel:	**9.0 %**	Subclass Slope:	
2.7 Entrenchment Ratio:	**1.70**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**1.45**	Silt and Smaller:	**2.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**6**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-Dominant	**0-25**	**>100**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Trib 12 to West River** Reach: **T12.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**

4.2 Adjacent Wetlands: **Minimal**

4.3 Flow Status: **Low**

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.: **None**

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch: **0** Road Ditch: **1**

Other: **0** Tile Drain: **0**

Overland Flow: **0** Urb Strm Wtr Pipe: **0**

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Diagonal:

Mid:

Delta:

Point:

Island:

Side: **1**

Braiding: **0**

5.2 Other Features

Flood chutes: **1**

5.3 Steep Riffles and Head Cuts

Steep Riffles: **0**

Neck Cutoff: **0**

Avulsion: **0**

Head Cuts: **0**

Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **None**

Straightening Length (ft.): **0**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score: **0**

Habitat Rating: **0.00**

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**14**	**None**	**Yes**	Geomorphic Rating	**0.65**
7.2 Channel Aggradation		**14**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**I**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**52**			Stream Sensitivity	**Moderate**

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.02-0**
Segment Length(ft): **1,273**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: **10/24/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Also known as Thompsonburg Brook. Along Thompsonburg Road bisected by Cross Road**

Step 5 - Notes:

Step 7 - Narrative: **Majority of the reach is encroached by Thompsonburg Rd with near continuous armoring along the right bank. It is very likely that the reach was straightened when the road was constructed, decreasing valley width, but not likely changing the reference stream type. The reach maintained access to an elevated bench for most of the left bank, but was incised. We assessed as Stage II due to historic incision.**

Step 1. Valley and Floodplain

1.1 Segmentation: **None**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**1,273**	**5**	
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**0**		

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Extr.Steep**	**Extr.Steep**
Continuous w/ Bank:	**Always**	**Always**
Within 1 Bankfull W:	**Always**	**Always**
Texture:	**Cobble**	**Cobble**

1.5 Valley Features
Valley Width (ft): **60**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**8.0**	**3.0**	**No**	**No**

Stream: **Trib 12 to West River** Reach: **T12.02-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**25.00**	2.11 Riffle/Step Spacing:	**60 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**2.0 %**	Bar:	**110**	**mm**
2.4 Floodprone Width (ft.):	**52.00**	Boulder:	**23.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.00**	Cobble:	**36.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**10.04**	Fine Gravel:	**6.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.08**	Sand:	**10.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**1.88**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**11**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Coniferous**	**Shrubs/Sapling**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**785.9**	Canopy %:	**76-100**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**0**	**538**
Buffer Vegitation Type		
Dominant	**Coniferous**	**None**
Sub-Dominant	**None**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Residential**
Sub-dominant	**None**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Trib 12 to West River** Reach: **T12.02-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**

4.2 Adjacent Wetlands: **None**

4.3 Flow Status: **Low**

4.4 # of Debris Jams: **1**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.: **None**

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch:	**0**	Road Ditch:	**1**
Other:	**0**	Tile Drain:	**0**
Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Diagonal:

Mid:

Delta:

Point:

Island:

Side: **1**

Braiding: **0**

5.2 Other Features

Flood chutes: **0**

5.3 Steep Riffles and Head Cuts

Steep Riffles: **0**

Neck Cutoff: **0**

Avulsion: **0**

Head Cuts: **0**

Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **Straightening**

Straightening Length (ft.): **274**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score: **0**

Habitat Rating: **0.00**

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type	Left	Right
6.8 Bank Stability:		
6.9 Bank Vegetation Protection		
6.10 Riparian Veg. Zone Width:		

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**9**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**11**	**None**	**No**
7.4 Change in Planforml	**11**	**None**	**No**
Total Score	**43**		

Geomorphic Rating	**0.54**
Channel Evolution Model	**F**
Channel Evolution Stage	**II**
Geomorphic Condition	**Fair**
Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.03-0**
Segment Length(ft): **5,958**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB JMD**
Completion Date: **10/24/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Also known as Thompsonburg Brook.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is highly variable with portions that were likely reference Bc, however the majority of the reach is reference C with a broad valley. Much of the reach is encroached by Thompsonburg Road leading to an overall change in valley confinement to Narrow. Incision is likely historic and areas of mid channel sediment accumulation and several flood chutes were observed, suggesting that some Stage IV adjustments are occurring. We assessed the reach as Stage II due to historic incision and the lack of actual planform adjustment despite the sediment accumulation.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	**0**			
Road:	**5,958**	**5**		
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**0**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Steep**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features	
Valley Width (ft):	**130**
Width Determination:	**Measured**
Confinement Type:	**NW**
In Rock Gorge:	**No**
Human Caused Change in Valley Width?:	**Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**1.0**	**0.0**	**No**	**No**

Stream: **Trib 12 to West River** Reach: **T12.03-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**27.60**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**48.00**	Boulder:	**23.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.10**	Cobble:	**33.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.08**	Fine Gravel:	**5.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.74**	Sand:	**20.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.28**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**47**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**44.0**	**45.2**	Dominant:	**Deciduous**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.3**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**146.0**	**1,758.7**	Canopy %:	**76-100**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**492**	**2,481**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Shrubs/Sapling**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Residential**	Mass Failures		
Sub-dominant	**Residential**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Trib 12 to West River** Reach: **T12.03-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**2**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**6**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**3**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**2**	Delta:		Flood chutes:	**4**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**2,086**
Side:	**4**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.03-0**
Segment Length(ft): **5,958**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB JMD**
Completion Date: **10/24/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Also known as Thompsonburg Brook.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is highly variable with portions that were likely reference Bc, however the majority of the reach is reference C with a broad valley. Much of the reach is encroached by Thompsonburg Road leading to an overall change in valley confinement to Narrow. Incision is likely historic and areas of mid channel sediment accumulation and several flood chutes were observed, suggesting that some Stage IV adjustments are occurring. We assessed the reach as Stage II due to historic incision and the lack of actual planform adjustment despite the sediment accumulation.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	**0**			
Road:	**5,958**	**5**		
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**0**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Steep**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features	
Valley Width (ft):	**130**
Width Determination:	**Measured**
Confinement Type:	**NW**
In Rock Gorge:	**No**
Human Caused Change in Valley Width?:	**Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**1.0**	**0.0**	**No**	**No**

Stream: **Trib 12 to West River** Reach: **T12.03-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**27.60**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**48.00**	Boulder:	**23.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.10**	Cobble:	**33.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.08**	Fine Gravel:	**5.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.74**	Sand:	**20.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.28**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**47**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**44.0**	**45.2**	Dominant:	**Deciduous**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.3**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**146.0**	**1,758.7**	Canopy %:	**76-100**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**492**	**2,481**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Shrubs/Sapling**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Residential**	Mass Failures		
Sub-dominant	**Residential**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Trib 12 to West River** Reach: **T12.03-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **6**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **0**
Other: **0** Tile Drain: **0**
Overland Flow: **2** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **3**
Mid: **2**
Delta:
Point:
Island:
Side: **4**
Braiding: **0**

5.2 Other Features
Flood chutes: **4**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **Straightening**
Straightening Length (ft.): **2,086**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.04-0**
Segment Length(ft): **5,106**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Also known as Thompsonburg Brook. Along Thompsonburg Road from Mansfield Lane to Fieldstone Way**

Step 5 - Notes:

Step 7 - Narrative: **The reach is variable with areas of naturally or human caused confinement. Encroachment from thomsonsburg road increases incision in some locations. Overall the reach has scattered areas of widening and planform adjustment but this is limited due to coarse native substrate and areas of historic bank armoring. We assessed the reach as Stage II due to historic incision and limited evidence of widening or planform adjustment. The reach is showing active aggradation and may be transitioning to stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation: **None**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	**0**			
Road:	**2,485**	**5**		
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**1,052**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **230**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **Trib 12 to West River** Reach: **T12.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**25.50**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**160 mm**
2.3 Mean Depth (tf):	**2.13**	Bedrock:	**0.0 %**	Bar:	**120 mm**
2.4 Floodprone Width (ft.):	**55.00**	Boulder:	**12.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**44.0 %**	Stream Type:	**C**
Human Elev FloodPln (ft.):		Coarse Gravel:	**21.0 %**	Bed Material:	**Cobble**
2.6 Width/Depth Ratio:	**11.97**	Fine Gravel:	**13.0 %**	Subclass Slope:	
2.7 Entrenchment Ratio:	**2.16**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**1.50**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**40**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**48.1**	**162.7**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**1.9**	**2.5**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**511.5**	**493.8**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,169**	**1,407**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Deciduous**
Sub-Dominant	**Deciduous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Residential**	**Residential**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Trib 12 to West River** Reach: **T12.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**5**	Delta:		Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**1**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**10**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.56**
7.2 Channel Aggradation		**12**	**None**	**Yes**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**45**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-A**
Segment Length(ft): **1,710**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts at the confluence with T12 and continues upstream through a near continuous grade control. Segment break is located at the top of the long grade control.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically straightened and is deeply incised and entrenched due to the elevated roadway on the left bank. Bedrock grade controls were observed through most of the reach, there is no opportunity for further incision or widening.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Grade Controls**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	228	10	1,482	12
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		749	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Always	Always
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **237**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Stream: **West River** Reach: **R19-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**117.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**600**	**mm**
2.3 Mean Depth (tf):	**2.37**	Bedrock:	**0.0 %**	Bar:	**10**	**mm**
2.4 Floodprone Width (ft.):	**130.00**	Boulder:	**50.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**28.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**10.0 %**	Bed Material:	**Boulder**	
2.6 Width/Depth Ratio:	**49.37**	Fine Gravel:	**4.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.11**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Deciduous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**1,333.4**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**738**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Industrial**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R19-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**3**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**1,401**
Side: **1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**Yes**	Geomorphic Rating	**0.35**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**5**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**28**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-B**
Segment Length(ft): **3,205**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts above the long grade control and continues to the segment break upstream of the Route 100 bridge where the valley width increases.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is pinned between two roads with elevated fill along both banks. No opportunity for widening or planform adjustment and limited opportunity for additional incision due to grade control**

Step 1. Valley and Floodplain

1.1 Segmentation: **Grade Controls**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:			0	
Road:			3,205	12
Railroad:			0	
Imp. Path:			0	
Dev.:			3,205	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Always	Always
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **110**
Width Determination: **Measured**
Confinement Type: **NC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R19-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**81.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.90**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**3.49**	Bedrock:	**70.0 %**	Bar:	**10**	**mm**
2.4 Floodprone Width (ft.):	**95.00**	Boulder:	**10.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**16.00**	Cobble:	**0.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**0.0 %**	Bed Material:	**Bedrock**	
2.6 Width/Depth Ratio:	**23.21**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.17**	Sand:	**10.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**3.27**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**0**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type:	**Mix**	**Mix**
Consistency:	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**
Consistency:	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft.):	**0.0**	**0.0**
Erosion Height (ft.):	**0.0**	**0.0**
Revetment Type:	**Multiple**	**Rip-Rap**
Revetment Length:	**2,042.7**	**1,224.9**

Near Bank Vegetation Type	Left	Right
Dominant:	**Herbaceous**	**Herbaceous**
Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Bank Canopy		
Canopy %:	**1-25**	**1-25**
Mid-Channel Canopy:	**Open**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**2,253**	**1,509**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Commercial**	**Residential**
Sub-dominant	**Residential**	**Commercial**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R19-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**2**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**2,719**
Side:	**4**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-B**
Segment Length(ft): **3,205**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts above the long grade control and continues to the segment break upstream of the Route 100 bridge where the valley width increases.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is pinned between two roads with elevated fill along both banks. No opportunity for widening or planform adjustment and limited opportunity for additional incision due to grade control**

Step 1. Valley and Floodplain

1.1 Segmentation: **Grade Controls**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:			0	
Road:			3,205	12
Railroad:			0	
Imp. Path:			0	
Dev.:			3,205	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Always	Always
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **110**
Width Determination: **Measured**
Confinement Type: **NC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R19-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**81.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.90**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**3.49**	Bedrock:	**70.0 %**	Bar:	**10**	**mm**
2.4 Floodprone Width (ft.):	**95.00**	Boulder:	**10.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**16.00**	Cobble:	**0.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**0.0 %**	Bed Material:	**Bedrock**	
2.6 Width/Depth Ratio:	**23.21**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.17**	Sand:	**10.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**3.27**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**0**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type:	**Mix**	**Mix**
Consistency:	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**
Consistency:	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft.):	**0.0**	**0.0**
Erosion Height (ft.):	**0.0**	**0.0**
Revetment Type:	**Multiple**	**Rip-Rap**
Revetment Length:	**2,042.7**	**1,224.9**

Near Bank Vegetation Type	Left	Right
Dominant:	**Herbaceous**	**Herbaceous**
Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Bank Canopy		
Canopy %:	**1-25**	**1-25**
Mid-Channel Canopy:	**Open**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**2,253**	**1,509**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Commercial**	**Residential**
Sub-dominant	**Residential**	**Commercial**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R19-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**2**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**	
Mid:	Delta:	Flood chutes: **0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	Island:	5.3 Steep Riffles and Head Cuts	Head Cuts:	**0**	Straightening Length (ft.):	**2,719**	
Side: **4**	Braiding: **0**	Steep Riffles: **0**	Trib Rejuv.:		5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-C**
Segment Length(ft): **9,046**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts upstream of the Route 100 bridge and continues north through the wider valley to the upstream reach break where the valley naturally returns to a confined setting.**

Step 5 - Notes:

Step 7 - Narrative: **Large cobble bars were observed throughout the segment along with numerous areas of erosion indicating that the reach is widening and aggrading coarse sediment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Valley Width**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	321	15	1,352	19
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,349		1,353	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **839**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**4.0**	**2.0**	**No**	**No**

Stream: **West River** Reach: **R19-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**91.00**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.40**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**186.00**	Boulder:	**16.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.40**	Cobble:	**42.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**36.55**	Fine Gravel:	**11.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.04**	Sand:	**2.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.29**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**6.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**14**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**595.8**	**429.7**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**6.4**	**7.2**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**96.5**	**764.8**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**538**	**1,006**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Hay**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**16.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R19-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Abundant**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **1**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch:	**0**	Road Ditch:	**1**
Other:	**0**	Tile Drain:	**0**
Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**

4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **5**
Mid: **3**
Delta:
Point: **1**
Island:
Side: **23**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **6**
Avulsion: **1**

5.3 Steep Riffles and Head Cuts
Head Cuts: **0**
Steep Riffles: **0**
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type — Left — Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type: **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**No**
7.2 Channel Aggradation	**9**	**None**	**No**
7.3 Widening Channel	**8**	**None**	**No**
7.4 Change in Planforml	**9**	**None**	**No**
Total Score	**40**		

Geomorphic Rating: **0.50**
Channel Evolution Model: **F**
Channel Evolution Stage: **III**
Geomorphic Condition: **Fair**
Stream Sensitivity: **High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R20-0**
Segment Length(ft): **6,024**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/9/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Londonderry Village Market to VT 100 bridge.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is extensively straightened along Route 100 and is pinned against the left valley wall. Historically the reach likely had some sinuousity and small flood benches. The reach is stuck in Stage II with no opportunity for widening or planform adjustment. Incision is unlikely due to coarse bed material.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	**0**			
Road:	**6,024**	**10**		
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**761**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Extr.Steep**	**Extr.Steep**
Continuous w/ Bank:	**Always**	**Sometimes**
Within 1 Bankfull W:	**Always**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **142**
Width Determination: **Measured**
Confinement Type: **NC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R20-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**91.00**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.00**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.55**	Bedrock:	**0.0 %**	Bar:	**200**	**mm**
2.4 Floodprone Width (ft.):	**110.00**	Boulder:	**21.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**11.20**	Cobble:	**46.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**21.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**35.69**	Fine Gravel:	**4.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.21**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.80**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**2**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**89.0**	**4,211.3**	Canopy %:	**26-50**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**None**	**26-50**
W less than 25	**0**	**5,846**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Herbaceous**
Sub-Dominant	**None**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Commercial**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R20-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**6**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**5,812**
Side:	**4**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**Yes**	Geomorphic Rating	**0.34**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**27**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R21-0**
Segment Length(ft): **3,191**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/9/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From VT11 bridge to Londonderry Village Market.**

Step 5 - Notes:

Step 7 - Narrative: **Channel is pinned against the left valley wall for most of the length and is encroached by development along most fo the right bank, leading to a change in valley confinment. The channel is incised and the right floodplain is fully developed. Upstream dam is interupting sediment transport and likely contributing to incision. The reach is stuck in Stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	83	2	0	
Road:	2,546	6	642	15
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	2,520		654	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Very Steep**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **374**
Width Determination: **Measured**
Confinement Type: **NW**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**6.0**	**4.0**	**No**	**No**

Stream: **West River** Reach: **R21-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**82.90**	2.11 Riffle/Step Spacing:	**450 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.10**	2.12 Substrate Composition		Bed:	**240**	**mm**
2.3 Mean Depth (tf):	**2.86**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**175.00**	Boulder:	**18.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.40**	Cobble:	**46.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**28.99**	Fine Gravel:	**7.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.11**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.80**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**2**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**69.3**	**497.2**	Dominant:	**Coniferous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.0**	**3.3**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**384.0**	**423.6**	Canopy %:	**51-75**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**0**	**827**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Herbaceous**
Sub-Dominant	**None**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Commercial**	Mass Failures		
Sub-dominant	**Hay**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**17.5**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R21-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**Up Stream**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**110**
Side:	**5**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to F**	**Yes**	Geomorphic Rating	**0.36**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**6**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**29**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R22-A**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers:
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **impounded**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**			**0**	
Road:	**1,355**	**7**		**1,054**	**4**
Railroad:	**0**			**0**	
Imp. Path:	**0**			**0**	
Dev.:	**299**			**1,159**	

1.4 Adjacent Side — Left — Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Dam	**Mid-Segment**	**20.0**	**30.0**	**No**	**No**

Stream: **West River** Reach: **R22-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):
2.2 Max Depth (ft.):
2.3 Mean Depth (tf):
2.4 Floodprone Width (ft.):
2.5 Aband. Floodpn (ft.):
Human Elev FloodPln (ft.):
2.6 Width/Depth Ratio: **0.00**
2.7 Entrenchment Ratio: **0.00**
2.8 Incision Ratio: **0.00**
Human Elevated Inc. Rat.: **0.00**
2.9 Sinuosity:
2.10 Riffles Type:

2.11 Riffle/Step Spacing:
2.12 Substrate Composition
Bedrock: %
Boulder: %
Cobble: %
Coarse Gravel: %
Fine Gravel: %
Sand: %
Silt and Smaller: %
Silt/Clay Present:
Detritus: %
Large Woody Debris:

2.13 Average Largest Particle on
Bed:
Bar:
2.14 Stream Type
Stream Type:
Bed Material:
Subclass Slope:
Bed Form:
Field Measured Slope:
2.15 Sub-reach Stream Type
Reference Stream Type:
Reference Bed Material:
Reference Subclass Slope:
Reference Bedform:

Step 3. Riparian Features

3.1 Stream Banks

Bank Texture
Upper — Left — Right
Material Type:
Consistency:
Lower
Material Type:
Consistency:

Typical Bank Slope:

Bank Erosion	Left	Right
Erosion Length (ft.):	**99.1**	**330.0**
Erosion Height (ft.):	**4.0**	**3.9**
Revetment Type:	**Rip-Rap**	**Other**
Revetment Length:	**226.4**	**92.3**

Near Bank Vegetation Type — Left — Right
Dominant:
Sub-dominant:
Bank Canopy
Canopy %:
Mid-Channel Canopy:

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25	**1,341**	**114**

Buffer Vegitation Type
Dominant
Sub-Dominant

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant		
Sub-dominant		
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**One**	**3.0**

	Left	Right
Mass Failures		
Height		
Gullies Number	**1**	
Gullies Length	**50**	

Stream: **West River** Reach: **R22-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.:

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch: **0** Road Ditch: **1**

Other: **0** Tile Drain: **0**

Overland Flow: **0** Urb Strm Wtr Pipe: **0**

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Diagonal:

Mid:

Delta:

Point:

Island:

Side:

Braiding: **0**

5.2 Other Features

Flood chutes: **0**

5.3 Steep Riffles and Head Cuts

Steep Riffles: **0**

Neck Cutoff: **0**

Avulsion: **0**

Head Cuts: **0**

Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **None**

Straightening Length (ft.): **0**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating

Channel Evolution Model

Channel Evolution Stage

Geomorphic Condition

Stream Sensitivity

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R22-B**
Segment Length(ft): **1,210**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **10/19/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT100**

Step 5 - Notes:

Step 7 - Narrative: **Route 100 is a major encroachment on the channel and has pinned the river against the left valley wall. The channel is incised with no floodplain access due to Route 100. The channel has no opportunity for widening or planform and therefore stuck in stage II. The downstream dam affects sediment transport and has reduced the channel slope.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Flow Status**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	1,210	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	652		168	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Sand**	**Sand**

1.5 Valley Features
Valley Width (ft): **251**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R22-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**54.70**	2.11 Riffle/Step Spacing:	**550 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.35**	2.12 Substrate Composition		Bed:	**100**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**12.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**59.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**21.97**	Fine Gravel:	**6.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.37**	Sand:	**21.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.09**	Silt and Smaller:	**2.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**171.4**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.0**	**0.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**592.5**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**0**	**676**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Herbaceous**
Sub-Dominant	**None**	**Invasives**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R22-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**681**
Side: **2**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**C to F**	**Yes**	Geomorphic Rating	**0.43**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**34**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R23-0**
Segment Length(ft): **5,084**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT100**

Step 5 - Notes:

Step 7 - Narrative: **Channel is incised with signs of active widening and planform adjustment as increased sediment (gravel) works through the reach.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	766	10		274	10
Railroad:	0			0	
Imp. Path:	1,181	18		0	
Dev.:	0			67	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **425**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R23-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**71.30**	2.11 Riffle/Step Spacing:	**650 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.50**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.71**	Bedrock:	**0.0 %**	Bar:	**50**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**3.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.90**	Cobble:	**9.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**44.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**26.31**	Fine Gravel:	**25.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.12**	Sand:	**17.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.26**	Silt and Smaller:	**2.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**12**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**470.7**	**147.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.8**	**6.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**115.5**	**444.5**	Canopy %:	**51-75**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**108**	**413**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**Multiple**	**20.0**	Gullies Length	**100**	
Gullies	**One**	**4.0**			

Stream: **West River** Reach: **R23-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**4**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**4**	Delta:	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:		Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**477**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**C to F**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R24-A**
Segment Length(ft): **3,039**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Between VT100 and Boynton Road**

Step 5 - Notes:

Step 7 - Narrative: **Channel has active widening, aggradation, and planform adjustment processes. The floodplain is elevated but incision is generally <2. Review of historic imagery shows several areas of migration, which is ongoing.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:					
Road:					
Railroad:					
Imp. Path:					
Dev.:					

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Sand**	**Sand**

1.5 Valley Features
Valley Width (ft): **1,306**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R24-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**64.00**	2.11 Riffle/Step Spacing:	**550 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**140**	**mm**
2.3 Mean Depth (tf):	**1.62**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**140.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.20**	Cobble:	**26.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**34.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**39.51**	Fine Gravel:	**28.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.19**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.73**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Oxbows**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**9**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**698.1**	**202.5**	Dominant:	**Herbaceous**	**Invasives**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.5**	**3.9**	Sub-dominant:	**Invasives**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**0**	**0**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**1,100**	**173**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Invasives**
Sub-Dominant	**Invasives**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Shrubs/Sapling**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R24-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**1**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**60**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**3**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**4**	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**	
Point:	**4**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**9**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.40**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**6**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**32**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R24-B**
Segment Length(ft): **4,394**
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From VT100 bridge to between VT100 and Boynton Road**

Step 5 - Notes:

Step 7 - Narrative: **The segment is moderately incised with a large floodplain available on one or both banks throughout. We did not observe many areas of active widening, partially slowed by historic bank armoring. The channel had increased sediment load with numerous mid channel bars and partially filled riffles. We assessed the reach as early stage III with aggradation being the dominant process.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		**0**			
Road:		**737**	**8**		
Railroad:		**0**			
Imp. Path:		**0**			
Dev.:		**1,510**			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Hilly**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **1,528**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R24-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**80.60**	2.11 Riffle/Step Spacing:	**700 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**1.59**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**1,100.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.30**	Cobble:	**45.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**31.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**50.69**	Fine Gravel:	**12.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**13.65**	Sand:	**7.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.77**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**10**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**556.1**	**359.6**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.0**	**2.8**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**369.6**	**192.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**1,350**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Pasture**	**Residential**	Mass Failures		
Sub-dominant	**Forest**	**Forest**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R24-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**4**	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**	
Point:	**3**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**5**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic		
7.1 Channel Degradation	**9**	**None**	**Yes**	Geomorphic Rating	**0.47**
7.2 Channel Aggradation	**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel	**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml	**13**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score	**38**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-A**
Segment Length(ft): **2,935**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **9/23/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From between Highland View Road and VT 100 to VT 100 bridge**

Step 5 - Notes:

Step 7 - Narrative: **The reach is incised leading to a departure to F type. Incision is likely due to historic straightening. Minimal evidence of widening or aggradation.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**				
Road:	**0**				
Railroad:	**0**				
Imp. Path:	**958**	**8**			
Dev.:	**0**				

1.6 Grade Controls:

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **1,121**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

Stream: **West River** Reach: **R25-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**68.30**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.16**	Bedrock:	**0.0 %**	Bar:	**160**	**mm**
2.4 Floodprone Width (ft.):	**90.00**	Boulder:	**1.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**57.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**27.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**31.62**	Fine Gravel:	**4.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.32**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:		Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**80.3**	**26.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.0**	**6.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**62.7**	**209.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**0**	**955**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Hay**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R25-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**1,249**
Side: **6**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to F**	**Yes**	Geomorphic Rating	**0.47**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**38**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-B**
Segment Length(ft): **3,321**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Valley parallel to Highland View Road/Summit Trail Road (west) and VT 100 (east).**

Step 5 - Notes:

Step 7 - Narrative: **Aggradation is the dominant process within this segment. The channel is overwidened in many places with large mid channel and diagonal bars. Active bank erosion is limited, suggesting that the channel is not actively adjusting planform.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Valley Width**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Steep**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **1,093**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **West River** Reach: **R25-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**199.70**	2.11 Riffle/Step Spacing:	**650 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.60**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**1.05**	Bedrock:	**0.0 %**	Bar:	**200**	**mm**
2.4 Floodprone Width (ft.):	**600.00**	Boulder:	**2.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**52.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**190.19**	Fine Gravel:	**5.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.00**	Sand:	**12.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.25**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**2.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**18**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**139.4**	**53.7**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.7**	**5.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**0**	**550**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Residential**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**One**	**25.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R25-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**2**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**317**
Side:	**8**	Braiding:	**4**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.52**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**42**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-C**
Segment Length(ft): **4,221**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Valley parallel to Holden Hill Road (west) and VT 100 (east).**

Step 5 - Notes:

Step 7 - Narrative: **The channel was historically straightened and is pinned against the right valley wall. Large unvegetated side bars were observed through most of the segment suggesting that aggradation is the dominant process. We observed some areas of erosion, but the widened channel appears to be historic and not actively widening.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:			
Road:			
Railroad:			
Imp. Path:			
Dev.:			

1.6 Grade Controls:

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Very Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **735**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

Stream: **West River** Reach: **R25-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**96.80**	2.11 Riffle/Step Spacing:	**1000 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.80**	2.12 Substrate Composition		Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**2.09**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**400.00**	Boulder:	**13.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.00**	Cobble:	**65.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**14.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**46.32**	Fine Gravel:	**1.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**4.13**	Sand:	**7.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.32**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**12**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**206.3**	**212.9**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**8.0**	**6.0**	Sub-dominant:	**Coniferous**	**Coniferous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**1-25**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**51-100**	**None**
W less than 25	**1,542**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Coniferous**
Sub-Dominant	**Coniferous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**17.5**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R25-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**2,263**
Side: **7**	Braiding: **1**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**Yes**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-D**
Segment Length(ft): **4,360**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RFS**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Valley parallel to Morgan Hill Road (west) and VT 100 (east).**

Step 5 - Notes:

Step 7 - Narrative: **The segment is historically straightened and is deeply incised. Incision is the dominant process, however we did observe formation of large side bars suggesting that aggradation may be starting.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	**0**			
Road:	**0**			
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**828**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Steep**	**Steep**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **600**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R25-D**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**61.10**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.40**	2.12 Substrate Composition		Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**2.24**	Bedrock:	**0.0 %**	Bar:	**120**	**mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**17.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**8.50**	Cobble:	**48.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**27.28**	Fine Gravel:	**2.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.23**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.50**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**8**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**247.8**	**0.0**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.2**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**36.5**	**0.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**51-100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**1,598**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Mixed Trees**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Forest**	Mass Failures		
Sub-dominant	**Forest**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**2**	
Failures	**One**	**30.0**	Gullies Length	**280**	
Gullies	**Multiple**	**7.5**			

Stream: **West River** Reach: **R25-D**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**3**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,579**
Side:	**3**	Braiding:	**1**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**6**	**C to F**	**Yes**	Geomorphic Rating	**0.47**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**38**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R26-0**
Segment Length(ft): **1,412**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 100 bisected by the Lawrence Hill Road**

Step 5 - Notes:

Step 7 - Narrative: **The entire reach is straightened and deeply incised with extensive bank armoring. The sediment regime is strongly affected by the large upstream dam. The reach is stuck in Stage II with no chance of adjustment.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	204	20	372	6
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,109		294	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Very Steep	Very Steep
Continuous w/ Bank:	Always	Sometimes
Within 1 Bankfull W:	Always	Sometimes
Texture:	Boulder	Boulder

1.5 Valley Features

Valley Width (ft): **200**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R26-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**41.00**	2.11 Riffle/Step Spacing:	**100 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.80**	2.12 Substrate Composition		Bed:	**600**	**mm**
2.3 Mean Depth (tf):	**2.89**	Bedrock:	**15.0 %**	Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**50.00**	Boulder:	**40.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**12.00**	Cobble:	**30.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**5.0 %**	Bed Material:	**Boulder**	
2.6 Width/Depth Ratio:	**14.19**	Fine Gravel:	**5.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.22**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**3.16**	Silt and Smaller:	**%**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**1.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**1**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**34.6**	**32.7**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Cohesive**	**Cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**1,023.0**	**999.3**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**51-100**	**51-100**
W less than 25	**942**	**332**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Residential**	**Residential**
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R26-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**1**
		4.6 Up/Down Strm flow reg.:	**Up Stream**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,031**
Side:	**1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**3**	**C to F**	**Yes**	Geomorphic Rating	**0.29**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**5**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**6**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**23**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R27-0**
Segment Length(ft): **2,698**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 100, Weston Dam backwaters most of the reach.**

Step 5 - Notes:

Step 7 - Narrative: **The majority of the reach is backwatered by the historic dam. The upper portion of the reach shows signs of aggradation of gravel. Elevated but accessible floodplain is located through most of the reach. Incision has caused a departure from C to Bc.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	**0**			
Road:	**2,120**	**4**	**519**	**4**
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**1,426**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **415**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Dam	**Mid-Segment**	**15.0**	**15.0**	**No**	**No**

Stream: **West River** Reach: **R27-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**73.90**	2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**4.20**	2.12 Substrate Composition		Bed:	**30 mm**
2.3 Mean Depth (tf):	**3.19**	Bedrock:	**0.0 %**	Bar:	**20 mm**
2.4 Floodprone Width (ft.):	**140.00**	Boulder:	**3.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**7.70**	Cobble:	**9.0 %**	Stream Type:	**B**
Human Elev FloodPln (ft.):		Coarse Gravel:	**47.0 %**	Bed Material:	**Gravel**
2.6 Width/Depth Ratio:	**23.17**	Fine Gravel:	**25.0 %**	Subclass Slope:	**c**
2.7 Entrenchment Ratio:	**1.89**	Sand:	**16.0 %**	Bed Form:	**Plane Bed**
2.8 Incision Ratio:	**1.83**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Not Applicable**	# Large Woody Debris:	**2**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**23.8**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**737.5**	**237.7**	Canopy %:	**0**	**0**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**1,284**	**1,269**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R27-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**1**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**1,044**
Side: **3**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to B**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**8**	**None**	**Yes**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R28-A**
Segment Length(ft): **1,634**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: **7/28/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT100**

Step 5 - Notes:

Step 7 - Narrative: **The segment typically has a narrower channel than the upstream segment with signs of active aggradation. Small areas of erosion and bank armor were observed but active widening is minimal.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	0		
Road:	594	5	
Railroad:	0		
Imp. Path:	0		
Dev.:	97		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Flat	Flat
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Never
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	920
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No

Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R28-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**32.40**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.50**	2.12 Substrate Composition		Bed:	**90**	**mm**
2.3 Mean Depth (tf):	**2.55**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**100.00**	Boulder:	**2.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.80**	Cobble:	**26.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**12.71**	Fine Gravel:	**12.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.09**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.66**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**67.7**	**13.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.0**	**2.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**130.2**	**111.4**	Canopy %:	**0**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**1,171**	**335**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Commercial**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R28-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**1**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**158**
Side:	**6**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.54**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**43**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R28-B**
Segment Length(ft): **7,377**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: **7/28/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Greendale Road bridge to between VT 100 and Lawrence Hill Road**

Step 5 - Notes:

Step 7 - Narrative: **The channel is actively widening and aggrading with many large depositional features and undercut banks. We assessed the reach as late stage III progressing towards planform adjustment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0			
Road:	3,782	7		
Railroad:	0			
Imp. Path:	617	5		
Dev.:	1,283			

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	911
Width Determination:	Measured
Confinement Type:	VB
In Rock Gorge:	No

Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		4.0	1.0	No	No

Stream: **West River** Reach: **R28-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**85.70**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**3.30**	2.12 Substrate Composition		Bed:	**160 mm**
2.3 Mean Depth (tf):	**1.78**	Bedrock:	**0.0 %**	Bar:	**50 mm**
2.4 Floodprone Width (ft.):	**300.00**	Boulder:	**5.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**5.60**	Cobble:	**32.0 %**	Stream Type:	**C**
Human Elev FloodPln (ft.):		Coarse Gravel:	**33.0 %**	Bed Material:	**Gravel**
2.6 Width/Depth Ratio:	**48.15**	Fine Gravel:	**10.0 %**	Subclass Slope:	
2.7 Entrenchment Ratio:	**3.50**	Sand:	**20.0 %**	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**1.70**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**22**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**127.9**	**13.0**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.4**	**3.0**	Sub-dominant:	**Herbaceous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**572.9**	**327.4**	Canopy %:	**51-75**	**51-75**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**51-100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**337**	**705**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Pasture**	**Forest**
Sub-dominant	**Forest**	**Pasture**
(Legacy)	Amount	Mean Hieght
Failures	**Multiple**	**20.7**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R28-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**4**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**12**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**
Mid:	**6**	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	**4**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**1,517**
Side:	**19**	Braiding: **0**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**None**	**Yes**	Geomorphic Rating	**0.43**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**34**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R29-A**
Segment Length(ft): **2,673**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Felton Road to Greendale Road bridge along VT 100**

Step 5 - Notes:

Step 7 - Narrative: **The lower portion of the segment is stable with well formed steps. The middle and upper portions have large depositional features and indicate that aggradation is active.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	822	10	442	9
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	563		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Very Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **180**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		8.0	6.0	No	No

Stream: **West River** Reach: **R29-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**32.80**	2.11 Riffle/Step Spacing:	**170 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.50**	2.12 Substrate Composition		Bed:	**220**	**mm**
2.3 Mean Depth (tf):	**1.92**	Bedrock:	**0.0 %**	Bar:	**200**	**mm**
2.4 Floodprone Width (ft.):	**56.00**	Boulder:	**49.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.40**	Cobble:	**22.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**13.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**17.08**	Fine Gravel:	**8.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.71**	Sand:	**8.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**2.16**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**14**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**121.1**	**73.8**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.1**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**217.1**	**92.1**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-Dominant	**None**	**51-100**
W less than 25	**109**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Residential**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R29-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**4**	Delta:		Flood chutes:	**1**	Avulsion:	**1**	5.5 Straightening:	**Straightening**
Point:		Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**211**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**Yes**	Geomorphic Rating	**0.61**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**13**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**49**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R29-B**
Segment Length(ft): **946**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Between VT 100 and Felton Road**

Step 5 - Notes:

Step 7 - Narrative: **Short segment with major historic impacts from straightening and encroachment resulting in an incised channel. We observed large deposits of coarse gravel suggesting that the channel is aggrading and in stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Subreach**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	908	10	29	10
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	103		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Steep**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **426**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R29-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**34.90**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.70**	2.12 Substrate Composition		Bed:	**359**	**mm**
2.3 Mean Depth (tf):	**1.77**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**52.00**	Boulder:	**15.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.80**	Cobble:	**45.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**19.72**	Fine Gravel:	**7.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.49**	Sand:	**14.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.78**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**1**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**66.8**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.5**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-Dominant	**None**	**26-50**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Shrubs/Sapling**
Sub-Dominant	**Herbaceous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Mass Failures		
Sub-dominant	**Residential**	**Commercial**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R29-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**		
Mid:	**2**	Delta:	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**1**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**827**	
Side:		Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to B**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-A**
Segment Length(ft): **2,273**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 100 from Kile Road to Felton Road**

Step 5 - Notes:

Step 7 - Narrative: **Segment is moderately incised, likely due to historic straightening. We did not observe signs of active widening or planform adjustment. The reach is stuck in Stage II due to moderate incision.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One Height	Both	Height
Berm:			
Road:			
Railroad:			
Imp. Path:			
Dev.:			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Silt/Clay**	**Silt/Clay**

1.5 Valley Features
Valley Width (ft): **530**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**1.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R30-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**14.60**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.90**	2.12 Substrate Composition		Bed:	**150**	**mm**
2.3 Mean Depth (tf):	**2.87**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**170.00**	Boulder:	**1.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.00**	Cobble:	**5.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**5.09**	Fine Gravel:	**26.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**11.64**	Sand:	**14.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.54**	Silt and Smaller:	**%**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:	**E**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:	**Gravel**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**179.8**	**110.9**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**3.1**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**67.5**	**82.3**	Canopy %:	**0**	**0**
Material Type:	**Silt**	**Silt**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R30-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**3**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**8**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:		Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**1**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**683**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.55**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**44**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-B**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers:
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **beaver dam**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan:
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side Left Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **West River** Reach: **R30-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):
2.2 Max Depth (ft.):
2.3 Mean Depth (tf):
2.4 Floodprone Width (ft.):
2.5 Aband. Floodpn (ft.):
Human Elev FloodPln (ft.):
2.6 Width/Depth Ratio: **0.00**
2.7 Entrenchment Ratio: **0.00**
2.8 Incision Ratio: **0.00**
Human Elevated Inc. Rat.: **0.00**
2.9 Sinuosity:
2.10 Riffles Type:

2.11 Riffle/Step Spacing:
2.12 Substrate Composition
Bedrock: %
Boulder: %
Cobble: %
Coarse Gravel: %
Fine Gravel: %
Sand: %
Silt and Smaller: %
Silt/Clay Present:
Detritus: %
Large Woody Debris:

2.13 Average Largest Particle on
Bed:
Bar:
2.14 Stream Type
Stream Type:
Bed Material:
Subclass Slope:
Bed Form:
Field Measured Slope:
2.15 Sub-reach Stream Type
Reference Stream Type:
Reference Bed Material:
Reference Subclass Slope:
Reference Bedform:

Step 3. Riparian Features

3.1 Stream Banks
Bank Texture
Upper Left Right
Material Type:
Consistency:
Lower
Material Type:
Consistency:

Bank Erosion Left Right
Erosion Length (ft.):
Erosion Height (ft.):
Revetment Type:
Revetment Length:

Typical Bank Slope:
Near Bank Vegetation Type Left Right
Dominant:
Sub-dominant:
Bank Canopy
Canopy %:
Mid-Channel Canopy:

3.2 Riparian Buffer

Buffer Width Left Right
Dominant
Sub-Dominant
W less than 25
Buffer Vegitation Type
Dominant
Sub-Dominant

3.3 Riparian Corridor

Corridor Land Left Right
Dominant
Sub-dominant
(Legacy) Amount Mean Hieght
Failures
Gullies

Left Right
Mass Failures
Height
Gullies Number
Gullies Length

Stream: **West River** Reach: **R30-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:
4.2 Adjacent Wetlands:
4.3 Flow Status:
4.4 # of Debris Jams:
4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.:
(old) Upstrm Flow Reg.:
4.7 Stormwater Inputs **None**
Field Ditch:
Road Ditch:
Other:
Tile Drain:
Overland Flow:
Urb Strm Wtr Pipe:
4.9 # of Beaver Dams:
Affected Length (ft):

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid:
Delta:
Point:
Island:
Side:
Braiding:
5.2 Other Features
Flood chutes:
5.3 Steep Riffles and Head Cuts
Steep Riffles:
Neck Cutoff:
Avulsion:
Head Cuts:
Trib Rejuv.:
5.4 Stream Ford or Animal Crossing:
5.5 Straightening:
Straightening Length (ft.): **0**
5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score:
Habitat Rating:
Habitat Stream Condition:
6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:
Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating
Channel Evolution Model
Channel Evolution Stage
Geomorphic Condition
Stream Sensitivity

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-C**
Segment Length(ft): **7,152**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 155 from Shattuck Road to above the beaver meadow north of Kile Road**

Step 5 - Notes:

Step 7 - Narrative: **Segment has extensive historic straightening and is general moderate to severely incised. Some areas of bank erosion show that widening and planform adjustment are starting, however the majority of the segment remains in Stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	934	4	0	
Road:	1,642	8	425	6
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	371		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **615**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R30-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**16.67**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**180**	**mm**
2.3 Mean Depth (tf):	**2.30**	Bedrock:	**0.0 %**	Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**28.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.90**	Cobble:	**34.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**42.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**7.25**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.68**	Sand:	**10.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.03**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**11**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**413.3**	**501.4**	Dominant:	**Shrubs/Sapling**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.1**	**2.4**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**591.7**	**343.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**>100**	**26-50**
W less than 25	**2,428**	**3,221**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Mixed Trees**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**Forest**	**Forest**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R30-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Abundant**
4.2 Adjacent Wetlands: **Abundant**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **4**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **1** Road Ditch: **0**
Other: **0** Tile Drain: **0**
Overland Flow: **0** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid: **4**
Delta:
Point: **2**
Island:
Side: **13**
Braiding: **0**

5.2 Other Features
Flood chutes: **1**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **4**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **Yes**
5.5 Straightening: **Straightening**
Straightening Length (ft.): **3,337**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**6**	**C to F**	**Yes**
7.2 Channel Aggradation	**9**	**None**	**No**
7.3 Widening Channel	**10**	**None**	**No**
7.4 Change in Planforml	**10**	**None**	**No**
Total Score	**35**		

Geomorphic Rating **0.44**
Channel Evolution Model **F**
Channel Evolution Stage **II**
Geomorphic Condition **Fair**
Stream Sensitivity **Extreme**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-C**
Segment Length(ft): **7,152**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 155 from Shattuck Road to above the beaver meadow north of Kile Road**

Step 5 - Notes:

Step 7 - Narrative: **Segment has extensive historic straightening and is general moderate to severely incised. Some areas of bank erosion show that widening and planform adjustment are starting, however the majority of the segment remains in Stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	934	4	0	
Road:	1,642	8	425	6
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	371		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **615**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R30-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**16.67**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**180**	**mm**
2.3 Mean Depth (tf):	**2.30**	Bedrock:	**0.0 %**	Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**28.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.90**	Cobble:	**34.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**42.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**7.25**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.68**	Sand:	**10.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.03**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**11**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**413.3**	**501.4**	Dominant:	**Shrubs/Sapling**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.1**	**2.4**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**591.7**	**343.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**>100**	**26-50**
W less than 25	**2,428**	**3,221**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Mixed Trees**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**Forest**	**Forest**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R30-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**4**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**	
Mid:	**4**	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**3,337**	
Side:	**13**	Braiding: **0**	Steep Riffles:	**4**	Trib Rejuv.:		5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**6**	**C to F**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.01-A**
Segment Length(ft): **4,669**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **11/11/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Barker Road from east of Landgrove Road to confluence with West River**

Step 5 - Notes:

Step 7 - Narrative: **The channel is incised likely due to historic manipulation, almost resulting in a departure to B. Banks indicated scour/erosion through most of the reach and the channel is overwidened, suggesting that widening is the dominant process.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	983		720	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **303**
Width Determination: **Measured**
Confinement Type: **NW**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Stream: **Utley Brook** Reach: **T14.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**69.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.42**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**200.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.70**	Cobble:	**39.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**22.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**28.51**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.90**	Sand:	**24.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.78**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**10**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**364.6**	**617.3**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.5**	**4.5**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**259.8**	**319.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**382**	**694**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**3**	
Failures	**Multiple**	**25.0**	Gullies Length	**290**	
Gullies	**Multiple**	**5.3**			

Stream: **Utley Brook** Reach: **T14.01-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **2**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **4**
Affected Length (ft): **9**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Mid: **1**
Point: **2**
Side: **10**
Diagonal:
Delta:
Island:
Braiding: **0**

5.2 Other Features
Flood chutes: **2**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**9**	**None**	**Yes**
7.2 Channel Aggradation	**10**	**None**	**No**
7.3 Widening Channel	**9**	**None**	**No**
7.4 Change in Planforml	**12**	**None**	**No**
Total Score	**40**		

Geomorphic Rating **0.50**
Channel Evolution Model **F**
Channel Evolution Stage **III**
Geomorphic Condition **Fair**
Stream Sensitivity **Very High**

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.01-B**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers:
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **beaver dam**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan:
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side Left Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **Utley Brook** Reach: **T14.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):
2.2 Max Depth (ft.):
2.3 Mean Depth (tf):
2.4 Floodprone Width (ft.):
2.5 Aband. Floodpn (ft.):
Human Elev FloodPln (ft.):
2.6 Width/Depth Ratio: **0.00**
2.7 Entrenchment Ratio: **0.00**
2.8 Incision Ratio: **0.00**
Human Elevated Inc. Rat.: **0.00**
2.9 Sinuosity:
2.10 Riffles Type:

2.11 Riffle/Step Spacing:
2.12 Substrate Composition
Bedrock: %
Boulder: %
Cobble: %
Coarse Gravel: %
Fine Gravel: %
Sand: %
Silt and Smaller: %
Silt/Clay Present:
Detritus: %
Large Woody Debris:

2.13 Average Largest Particle on
Bed:
Bar:
2.14 Stream Type
Stream Type:
Bed Material:
Subclass Slope:
Bed Form:
Field Measured Slope:
2.15 Sub-reach Stream Type
Reference Stream Type:
Reference Bed Material:
Reference Subclass Slope:
Reference Bedform:

Step 3. Riparian Features

3.1 Stream Banks
Bank Texture
Upper Left Right
Material Type:
Consistency:
Lower
Material Type:
Consistency:

Bank Erosion Left Right
Erosion Length (ft.):
Erosion Height (ft.):
Revetment Type:
Revetment Length:

Typical Bank Slope:
Near Bank Vegetation Type Left Right
Dominant:
Sub-dominant:
Bank Canopy
Canopy %:
Mid-Channel Canopy:

3.2 Riparian Buffer

Buffer Width Left Right
Dominant
Sub-Dominant
W less than 25
Buffer Vegitation Type
Dominant
Sub-Dominant

3.3 Riparian Corridor

Corridor Land Left Right
Dominant
Sub-dominant
(Legacy) Amount Mean Hieght
Failures
Gullies

Left Right
Mass Failures
Height
Gullies Number
Gullies Length

Stream: **Utley Brook** Reach: **T14.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:
4.2 Adjacent Wetlands:
4.3 Flow Status:
4.4 # of Debris Jams:
4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.:
(old) Upstrm Flow Reg.:
4.7 Stormwater Inputs **None**
Field Ditch:
Road Ditch:
Other:
Tile Drain:
Overland Flow:
Urb Strm Wtr Pipe:
4.9 # of Beaver Dams:
Affected Length (ft):
4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid:
Delta:
Point:
Island:
Side:
Braiding:
5.2 Other Features
Flood chutes:
5.3 Steep Riffles and Head Cuts
Steep Riffles:
Neck Cutoff:
Avulsion:
Head Cuts:
Trib Rejuv.:
5.4 Stream Ford or Animal Crossing:
5.5 Straightening:
Straightening Length (ft.): **0**
5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score:
Habitat Rating:
Habitat Stream Condition:
6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:
Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic		
7.1 Channel Degradation				Geomorphic Rating	
7.2 Channel Aggradation				Channel Evolution Model	
7.3 Widening Channel				Channel Evolution Stage	
7.4 Change in Planforml				Geomorphic Condition	
Total Score				Stream Sensitivity	

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.02-0**
Segment Length(ft): **10,803**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, FCP**
Completion Date: **6/14/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Landgrove Road**

Step 5 - Notes:

Step 7 - Narrative: **The reach is highly variable but consistently showing signs of active aggradation and areas of widening. The lower portion has a split channel that likely formed during recent floods (Irene?) with even flow between the two channels at baseflow. Significant midchannel sediment accumulation was observed throughout.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	**0**			
Road:	**555**	**12**		
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**0**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **512**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**3.0**	**2.0**	**No**	**No**

Stream: **Utley Brook** Reach: **T14.02-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**58.40**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**280**	**mm**
2.3 Mean Depth (tf):	**1.82**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**110.00**	Boulder:	**25.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.70**	Cobble:	**41.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**32.09**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.88**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.32**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**63**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**227.7**	**223.4**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.2**	**2.8**	Sub-dominant:	**None**	**Invasives**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**103.5**	**105.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,919**	**102**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**One**	**20.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Utley Brook** Reach: **T14.02-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**6**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**8**	Delta:	Flood chutes:	**8**	Avulsion:	**1**	5.5 Straightening:	**None**	
Point:	**4**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**27**	Braiding:	**0**	Steep Riffles:	**5**	Trib Rejuv.:	5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.04-0**
Segment Length(ft): **4,676**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, FCP**
Completion Date: **6/15/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Hapgood Pond Road crossing to Cody Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **The channel is deeply incised due to historical straightening. We assessed the reach as Stage II, however aggradation and areas of widening were observed, suggesting that it is slowly transitioning to Stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**670**	**8**	
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**0**		

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft): **630**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **Utley Brook** Reach: **T14.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**45.80**	2.11 Riffle/Step Spacing:	**600 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**80**	**mm**
2.3 Mean Depth (tf):	**2.62**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**58.00**	Boulder:	**1.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**0.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**49.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**17.48**	Fine Gravel:	**38.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.27**	Sand:	**12.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**32**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**304.7**	**314.8**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**4.2**	**4.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**57.4**	**61.3**	Canopy %:	**1-25**	**1-25**
Material Type:	**Sand**	**Sand**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**1,880**	**97**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Shrubs/Sapling**
Sub-dominant	**Shrubs/Sapling**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**One**	**17.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Utley Brook** Reach: **T14.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**		
Mid:	**2**	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**5**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,869**	
Side:	**16**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**6**	**C to F**	**Yes**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.05-0**
Segment Length(ft): **6,451**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, FCP**
Completion Date: **6/15/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Little Michigan Road crossing to Hapgood Pond Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **The reach was dominated by aggradation and widening with areas of bank erosion and large sediment deposits observed throughout. The channel is incised, likely due to historic management.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**				
Road:	**816**	**9**			
Railroad:	**0**				
Imp. Path:	**0**				
Dev.:	**306**				

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **898**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **Utley Brook** Reach: **T14.05-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**40.75**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**100**	**mm**
2.3 Mean Depth (tf):	**1.37**	Bedrock:	**0.0 %**	Bar:	**40**	**mm**
2.4 Floodprone Width (ft.):	**100.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.40**	Cobble:	**7.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**68.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**29.74**	Fine Gravel:	**17.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.45**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.93**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Oxbows**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**53**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**245.9**	**709.6**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.4**	**5.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Multiple**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**397.6**	**310.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**>100**
W less than 25	**568**	**3,176**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Utley Brook** Reach: **T14.05-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **4**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch:	**1**	Road Ditch:	**0**
Other:	**0**	Tile Drain:	**0**
Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**

4.9 # of Beaver Dams: **1**
Affected Length (ft): **1**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **7**
Mid: **3**
Delta:
Point: **9**
Island:
Side: **25**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **1**
Avulsion: **0**

5.3 Steep Riffles and Head Cuts
Steep Riffles: **1**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **Straightening**
Straightening Length (ft.): **774**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type — Left — Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type: **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**11**	**None**	**Yes**
7.2 Channel Aggradation	**8**	**None**	**No**
7.3 Widening Channel	**8**	**None**	**No**
7.4 Change in Planforml	**10**	**None**	**No**
Total Score	**37**		

Geomorphic Rating: **0.46**
Channel Evolution Model: **F**
Channel Evolution Stage: **III**
Geomorphic Condition: **Fair**
Stream Sensitivity: **Very High**

Phase 2 Segment Summary Report West River

Stream: **Jones Brook**
Reach: **T14.S3.01-0**
Segment Length(ft): **2,058**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/2/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From above Hapgood Pond Road crossing (bisecting reach) to confluence with Utley Brook**

Step 5 - Notes:

Step 7 - Narrative: **The reach is overwidened with many areas of active meander development. Large sediment deposits and erosion were observed throughout. We assessed the reach as stage IV with active planform adjustment along the widened and historically incised channel. We classified the reach as a departure from E to B due to incision.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**0**		
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**559**		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **321**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **Jones Brook** Reach: **T14.S3.01-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**21.00**	2.11 Riffle/Step Spacing:	**80 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition			Bed:	**80**	**mm**
2.3 Mean Depth (tf):	**1.29**	Bedrock:	**0.0 %**		Bar:	**30**	**mm**
2.4 Floodprone Width (ft.):	**35.00**	Boulder:	**0.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**0.0 %**	Stream Type:	**B**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**16.28**	Fine Gravel:	**29.0 %**	Subclass Slope:	**c**		
2.7 Entrenchment Ratio:	**1.67**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**1.96**	Silt and Smaller:	**7.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**8**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**223.6**	**172.3**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**3.6**	**3.5**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**91.7**	**0.0**	Canopy %:	**0**	**0**
Material Type:	**Sand**	**Sand**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**51-100**	**51-100**
W less than 25	**842**	**847**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Pasture**	**Pasture**
Sub-dominant	**Commercial**	**Commercial**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Jones Brook** Reach: **T14.S3.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**2**	Tile Drain:	**0**
4.4 # of Debris Jams:	**6**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**1**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**2**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**	
Mid:	**2**	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**699**	
Side:	**19**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**C to B**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Jones Brook**
Reach: **T14.S3.01-0**
Segment Length(ft): **2,058**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/2/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From above Hapgood Pond Road crossing (bisecting reach) to confluence with Utley Brook**

Step 5 - Notes:

Step 7 - Narrative: **The reach is overwidened with many areas of active meander development. Large sediment deposits and erosion were observed throughout. We assessed the reach as stage IV with active planform adjustment along the widened and historically incised channel. We classified the reach as a departure from E to B due to incision.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**0**		
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**559**		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **321**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **Jones Brook** Reach: **T14.S3.01-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**21.00**	2.11 Riffle/Step Spacing:	**80 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition			Bed:	**80**	**mm**
2.3 Mean Depth (tf):	**1.29**	Bedrock:	**0.0 %**		Bar:	**30**	**mm**
2.4 Floodprone Width (ft.):	**35.00**	Boulder:	**0.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**0.0 %**	Stream Type:	**B**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**16.28**	Fine Gravel:	**29.0 %**	Subclass Slope:	**c**		
2.7 Entrenchment Ratio:	**1.67**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**1.96**	Silt and Smaller:	**7.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**8**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**223.6**	**172.3**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**3.6**	**3.5**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**91.7**	**0.0**	Canopy %:	**0**	**0**
Material Type:	**Sand**	**Sand**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**51-100**	**51-100**
W less than 25	**842**	**847**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Pasture**	**Pasture**
Sub-dominant	**Commercial**	**Commercial**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Jones Brook** Reach: **T14.S3.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**2**
4.4 # of Debris Jams:	**6**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**1**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**2**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**	
Mid:	**2**	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**699**	
Side:	**19**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**C to B**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Flood Brook**
Reach: **T13.04-0**
Segment Length(ft): **2,951**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the confluence with Farnum Brook to Forest Mountain Road**

Step 5 - Notes:

Step 7 - Narrative: **The channel is slightly overwidened with extensive gravel deposition throughout the reach. We assessed the reach as Stage III due to aggradation.**

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **468**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **Flood Brook** Reach: **T13.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**35.20**	2.11 Riffle/Step Spacing:	**100 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.10**	2.12 Substrate Composition		Bed:	**60**	**mm**
2.3 Mean Depth (tf):	**1.65**	Bedrock:	**0.0 %**	Bar:	**130**	**mm**
2.4 Floodprone Width (ft.):	**120.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.90**	Cobble:	**47.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**35.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**21.33**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.41**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.58**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**91**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**134.6**	**0.0**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**0.0**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**33.3**	**0.0**	Canopy %:	**51-75**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Deciduous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Flood Brook** Reach: **T13.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**6**	Delta:	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**None**	
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**25**	Braiding: **0**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.55**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**44**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **Farnum Brook**
Reach: **T13.S2.01-A**
Segment Length(ft): **5,301**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Hapgood Pond Road crossing to confluence with Flood Brook**

Step 5 - Notes:

Step 7 - Narrative: **The segment showed evidence of recent but not active widening and very active aggradation throughout. Large side bars or coarse gravel and cobble were near continuous through the segment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Valley Width**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One Height	Both Height
Berm:		
Road:		
Railroad:		
Imp. Path:		
Dev.:		

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **90**
Width Determination: **Measured**
Confinement Type: **NW**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **Farnum Brook** Reach: **T13.S2.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**20.50**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**1.25**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**31.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.00**	Cobble:	**48.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**38.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**16.40**	Fine Gravel:	**3.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.51**	Sand:	**6.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**1.67**	Silt and Smaller:	**%**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**112**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**26.6**	**37.8**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**6.0**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**33.8**	**78.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**14**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**11.7**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Farnum Brook** Reach: **T13.S2.01-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**7**	Delta:		Flood chutes:	**4**	Avulsion:	**1**	5.5 Straightening:	**None**
Point:	**1**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**44**	Braiding:	**1**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**No**	Geomorphic Rating	**0.59**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**14**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**47**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Farnum Brook**
Reach: **T13.S2.01-B**
Segment Length(ft): **1,910**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Moss Brook Road from Batchelder Barn Road crossing to Hapgood Pond Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **This segment was assessed as Stage II due to historic incision. Coarse sediment deposition indicates that the segment may be aggrading, however widening and planform adjustment were not active.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Subreach**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		**19**	**3**		
Road:		**0**			
Railroad:		**0**			
Imp. Path:		**0**			
Dev.:		**0**			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Steep**	**Steep**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **628**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **Farnum Brook** Reach: **T13.S2.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**14.00**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition		Bed:	**180**	**mm**
2.3 Mean Depth (tf):	**1.22**	Bedrock:	**0.0 %**	Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**1.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.80**	Cobble:	**54.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**36.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.48**	Fine Gravel:	**6.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**5.71**	Sand:	**3.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.56**	Silt and Smaller:	**%**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**4.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**1**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**204.8**	**179.4**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.7**	**3.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**138.1**	**134.9**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**26-50**
Sub-Dominant	**None**	**None**
W less than 25	**1,046**	**758**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Residential**	**Residential**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Farnum Brook** Reach: **T13.S2.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**	
Mid:	**1**	Delta:	Flood chutes:	**0**	Avulsion:	**1**	5.5 Straightening:	**None**	
Point:		Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**7**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**None**	**Yes**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Farnum Brook**
Reach: **T13.S2.01-C**
Segment Length(ft): **1,866**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Moss Brook Road from confluence of 2 small streams to form Farnum Brook to Batchelder Barn Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **The reach is moderately incised due to historic straightening and a large historic berm that significantly reduces access to the left floodplain. Large deposits of coarse gravel and cobble throughout indicate that aggradation is the dominant process. Minimal widening or erosion was observed.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	505	3	
Road:	0		
Railroad:	0		
Imp. Path:	0		
Dev.:	0		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **331**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **Farnum Brook** Reach: **T13.S2.01-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**17.80**	2.11 Riffle/Step Spacing:	**60 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**1.40**	2.12 Substrate Composition		Bed:	**250 mm**
2.3 Mean Depth (tf):	**0.97**	Bedrock:	**0.0 %**	Bar:	**100 mm**
2.4 Floodprone Width (ft.):	**26.00**	Boulder:	**2.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**3.80**	Cobble:	**36.0 %**	Stream Type:	**C**
Human Elev FloodPln (ft.):	**5.00**	Coarse Gravel:	**41.0 %**	Bed Material:	**Gravel**
2.6 Width/Depth Ratio:	**18.35**	Fine Gravel:	**10.0 %**	Subclass Slope:	**b**
2.7 Entrenchment Ratio:	**1.46**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**2.71**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**3.57**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**8.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**32**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**32.2**	**66.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.0**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**One**	**15.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Farnum Brook** Reach: **T13.S2.01-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**2**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**	
Mid:	**4**	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**	
Point:	**1**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**8**	Braiding:	**0**	Steep Riffles:	**2**	Trib Rejuv.:	5.5 Dredging:	**Dredging**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**37**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-A**
Segment Length(ft): **4,274**
Rain: **No**
Segment Version: West Reassessment 2022

SGAT Version: **4.53**
Organization:
Observers: **JHB JWC**
Completion Date: **11/10/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Just downstream of Lightfoot Camp Rd crossing, along Kendall Farm Rd**

Step 5 - Notes:

Step 7 - Narrative: **The reach shows signs of recent incision and active aggradation with very large cobble/gravel bars filling the widened channel. Many food chutes both active and recently abandoned were observed. The reach is in Stage III transitioning to Stage IV, with limited evidence of active erosion along the flood scoured banks.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **Yes**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**201**	**5**	
Road:	**586**	**10**	
Railroad:			
Imp. Path:			
Dev.:			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Steep**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **550**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **Winhall River** Reach: **T11.08-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**49.00**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.50**	Bedrock:	**0.0 %**	Bar:	**130**	**mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**29.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**56.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**19.60**	Fine Gravel:	**5.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.53**	Sand:	**5.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.41**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**64**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**432.3**	**758.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.1**	**4.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:			Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**229**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Hay**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number		
Failures			Gullies Length		
Gullies					

Stream: **Winhall River** Reach: **T11.08-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **6**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams:
Affected Length (ft):

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **5**
Mid: **5**
Delta:
Point: **2**
Island:
Side: **16**
Braiding: **1**

5.2 Other Features
Neck Cutoff:
Flood chutes: **10**
Avulsion: **3**

5.3 Steep Riffles and Head Cuts
Steep Riffles: **3**
Head Cuts:
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**10**	**C to B**	**No**
7.2 Channel Aggradation	**8**	**None**	**No**
7.3 Widening Channel	**10**	**None**	**No**
7.4 Change in Planforml	**11**	**None**	**No**
Total Score	**39**		

Geomorphic Rating	**0.49**
Channel Evolution Model	**F**
Channel Evolution Stage	**III**
Geomorphic Condition	**Fair**
Stream Sensitivity	**High**

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-A**
Segment Length(ft): **4,274**
Rain: **No**
Segment Version: West Reassessment 2022

SGAT Version: **4.53**
Organization:
Observers: **JHB JWC**
Completion Date: **11/10/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Just downstream of Lightfoot Camp Rd crossing, along Kendall Farm Rd**

Step 5 - Notes:

Step 7 - Narrative: **The reach shows signs of recent incision and active aggradation with very large cobble/gravel bars filling the widened channel. Many food chutes both active and recently abandoned were observed. The reach is in Stage III transitioning to Stage IV, with limited evidence of active erosion along the flood scoured banks.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **Yes**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**201**	**5**	
Road:	**586**	**10**	
Railroad:			
Imp. Path:			
Dev.:			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Steep**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **550**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **Winhall River** Reach: **T11.08-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**49.00**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.50**	Bedrock:	**0.0 %**	Bar:	**130**	**mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**29.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**56.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**19.60**	Fine Gravel:	**5.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.53**	Sand:	**5.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.41**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**64**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**432.3**	**758.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.1**	**4.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:			Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**229**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Hay**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number		
Failures			Gullies Length		
Gullies					

Stream: **Winhall River** Reach: **T11.08-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **6**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams:
Affected Length (ft):

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **5**
Mid: **5**
Delta:
Point: **2**
Island:
Side: **16**
Braiding: **1**

5.2 Other Features
Neck Cutoff:
Flood chutes: **10**
Avulsion: **3**

5.3 Steep Riffles and Head Cuts
Steep Riffles: **3**
Head Cuts:
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**10**	**C to B**	**No**
7.2 Channel Aggradation	**8**	**None**	**No**
7.3 Widening Channel	**10**	**None**	**No**
7.4 Change in Planforml	**11**	**None**	**No**
Total Score	**39**		

Geomorphic Rating **0.49**
Channel Evolution Model **F**
Channel Evolution Stage **III**
Geomorphic Condition **Fair**
Stream Sensitivity **High**

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-A**
Segment Length(ft): **4,921**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization: **Bear Creek Environmental**
Observers: **MB, AM**
Completion Date: **8/5/2013**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Just downstream of Lightfoot Camp Rd crossing, along Kendall Farm Rd**

Step 5 - Notes: **Most likely braided by reference due to change in slope and alluvial fan conditions. Aggradation and braided bedform exacerbated by TSI. Debris that came down from TSI is also contributing to the braided condition.**

Step 7 - Narrative: **FIV-->FV**
C4 Braided riffle pool channel. Likely a historic incision but active aggradation and planform is supporting a new healthy floodplain. Multiple avulsions and braiding through multiple channels likely the result in a slope and confinement change. Historic photos may support that this is an alluvial active area.

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0	5	0	3
Road:	0	10	0	
Railroad:	0		0	
Imp. Path:	0		0	0
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	N.E.	N.E.

1.5 Valley Features
Valley Width (ft): **690**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls: **None**

Stream: **Winhall River** Reach: **T11.08-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**68.50**	2.11 Riffle/Step Spacing:	**258.4 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.30**	2.12 Substrate Composition		Bed:	**8**	**inches**
2.3 Mean Depth (tf):	**1.90**	Bedrock:	**0.0 %**	Bar:	**3.24**	**inches**
2.4 Floodprone Width (ft.):	**466.00**	Boulder:	**8.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.60**	Cobble:	**36.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**30.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**36.05**	Fine Gravel:	**15.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**6.80**	Sand:	**11.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.70**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**53**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Pasture**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Winhall River** Reach: **T11.08-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Abundant**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments: **None**
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **Down Stream**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions: **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **8**
Mid: **3**
Delta: **0**
Point: **1**
Island: **0**
Side: **20**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **0**
Avulsion: **0**

5.3 Steep Riffles and Head Cuts
Head Cuts: **0**
Steep Riffles: **0**
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**10**	**C to B**	**No**
7.2 Channel Aggradation	**8**	**None**	**No**
7.3 Widening Channel	**10**	**None**	**No**
7.4 Change in Planforml	**11**	**None**	**No**
Total Score	**39**		

Geomorphic Rating **0.49**
Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Poor**
Stream Sensitivity **Very High**

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-A**
Segment Length(ft): **4,921**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization: **Bear Creek Environmental**
Observers: **MB, AM**
Completion Date: **8/5/2013**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Just downstream of Lightfoot Camp Rd crossing, along Kendall Farm Rd**

Step 5 - Notes: **Most likely braided by reference due to change in slope and alluvial fan conditions. Aggradation and braided bedform exacerbated by TSI. Debris that came down from TSI is also contributing to the braided condition.**

Step 7 - Narrative: **FIV-->FV**
C4 Braided riffle pool channel. Likely a historic incision but active aggradation and planform is supporting a new healthy floodplain. Multiple avulsions and braiding through multiple channels likely the result in a slope and confinement change. Historic photos may support that this is an alluvial active area.

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0	5	0	3
Road:	0	10	0	
Railroad:	0		0	
Imp. Path:	0		0	0
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	N.E.	N.E.

1.5 Valley Features
Valley Width (ft): **690**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls: **None**

Stream: **Winhall River** Reach: **T11.08-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**68.50**	2.11 Riffle/Step Spacing:	**258.4 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.30**	2.12 Substrate Composition		Bed:	**8**	**inches**
2.3 Mean Depth (tf):	**1.90**	Bedrock:	**0.0 %**	Bar:	**3.24**	**inches**
2.4 Floodprone Width (ft.):	**466.00**	Boulder:	**8.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.60**	Cobble:	**36.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**30.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**36.05**	Fine Gravel:	**15.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**6.80**	Sand:	**11.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.70**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**53**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Pasture**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Winhall River** Reach: **T11.08-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:	**None**	Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**8**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**		
Mid:	**3**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**1**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**20**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**C to B**	**No**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**39**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-B**
Segment Length(ft): **2,031**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization: **Bear Creek Environmental**
Observers: **MB, AM BCE**
Completion Date: **8/5/2013**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **upstream of Lightfoot Camp Rd crossing**

Step 5 - Notes: **Cross sectional area was 86% of the regional curve. If the bankfull elevation was raised to be closer to the curve, it would change the stream type to be more of an "F" channel. The benches, pools, and floodplain outlets warrant this segment to be a C to B departure and not a C to F.**

Step 7 - Narrative: **Historic incision but berming and road fill are mostly responsible for incision and entrenchment. Looks like stream may have accessed wetland to north. Re-routing road would be good project. Significant widening and aggradation and planform along with stream power at this slope (~1.3%) could yield a volatile reach.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0	3	0	3
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0	4	0	
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Very Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Never	Sometimes
Texture:	N.E.	N.E.

1.5 Valley Features

Valley Width (ft): **455**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls: **None**

Stream: **Winhall River** Reach: **T11.08-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**59.00**	2.11 Riffle/Step Spacing:	**280 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**14.4 inches**
2.3 Mean Depth (tf):	**1.72**	Bedrock:	**1.0 %**	Bar:	**5.1 inches**
2.4 Floodprone Width (ft.):	**80.50**	Boulder:	**30.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**4.40**	Cobble:	**28.0 %**	Stream Type:	**B**
Human Elev FloodPln (ft.):	**7.30**	Coarse Gravel:	**22.0 %**	Bed Material:	**Cobble**
2.6 Width/Depth Ratio:	**34.30**	Fine Gravel:	**14.0 %**	Subclass Slope:	**c**
2.7 Entrenchment Ratio:	**1.36**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**1.57**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	**1.27**
Human Elevated Inc. Rat.:	**2.61**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:	**C**
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**11**	Reference Bed Material:	**Cobble**
				Reference Subclass Slope:	**None**
				Reference Bedform:	**Riffle-Pool**

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type:	**Mix**	**Mix**
Consistency:	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**
Consistency:	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft.):	**0.0**	**0.0**
Erosion Height (ft.):	**0.0**	**0.0**
Revetment Type:	**None**	**None**
Revetment Length:	**0.0**	**0.0**

Near Bank Vegetation Type	Left	Right
Dominant:	**Deciduous**	**Deciduous**
Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Bank Canopy		
Canopy %:	**51-75**	**76-100**
Mid-Channel Canopy:	**Open**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Shrubs/Sapling**	**Mixed Trees**
Sub-Dominant	**Mixed Trees**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Winhall River** Reach: **T11.08-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:	**None**	Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**3**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**60**	**Yes**	**Yes**	**No**	**Yes**	**Scour Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**2**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**4**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**12**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**C to B**	**No**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**37**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-B**
Segment Length(ft): **2,678**
Rain: **No**
Segment Version: West Reassessment 2022

SGAT Version: **4.53**
Organization:
Observers: **JHB JWC**
Completion Date: **11/10/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **upstream of Lightfoot Camp Rd crossing**

Step 5 - Notes:

Step 7 - Narrative: **The channel is moderately incised with evidence that incision was recent and may be ongoing during large flow events. Incision is likely exacerbated by the forest road encroachment. A stream type departure of C to B was assessed due to incision. The channel is overwidened and filling with coarse sediment deposits along the sides. Much less mid channel accumulation than downstream. Forest road along left bank is a significant encroachment and cuts off the historic valley/floodplain.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan:
1.3 Corridor Encroachments:

Length (ft)	One Height	Both Height
Berm:	**256**	**3**
Road:		
Railroad:		
Imp. Path:	**1,197**	**4**
Dev.:		

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Very Steep**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Never**	**Sometimes**
Texture:	**Cobble**	**Cobble**

1.5 Valley Features
Valley Width (ft): **160**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **Winhall River** Reach: **T11.08-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**55.30**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**700**	**mm**
2.3 Mean Depth (tf):	**2.03**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**39.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.20**	Cobble:	**20.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):	**6.20**	Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**27.24**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.45**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.79**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**2.14**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**4**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**48.7**	**421.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**3.8**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**41.5**	**30.1**	Canopy %:	**76-100**	**76-100**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**		Height		
(Legacy)	Amount	Mean Hieght	Gullies Number		
Failures			Gullies Length		
Gullies					

Stream: **Winhall River** Reach: **T11.08-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams:

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.:
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch:	**0**	Road Ditch:	**4**
Other:	**0**	Tile Drain:	**0**
Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**

4.9 # of Beaver Dams:
Affected Length (ft):

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**60**	**Yes**	**Yes**	**No**	**Yes**	**Scour Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Mid: **2**
Point:
Side: **4**
Diagonal:
Delta:
Island:
Braiding:

5.2 Other Features
Flood chutes: **1**
5.3 Steep Riffles and Head Cuts
Steep Riffles:

Neck Cutoff:
Avulsion:
Head Cuts:
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**9**	**C to B**	**No**
7.2 Channel Aggradation	**10**	**None**	**No**
7.3 Widening Channel	**8**	**None**	**No**
7.4 Change in Planforml	**10**	**None**	**No**
Total Score	**37**		

Geomorphic Rating	**0.46**
Channel Evolution Model	**F**
Channel Evolution Stage	**III**
Geomorphic Condition	**Fair**
Stream Sensitivity	**High**

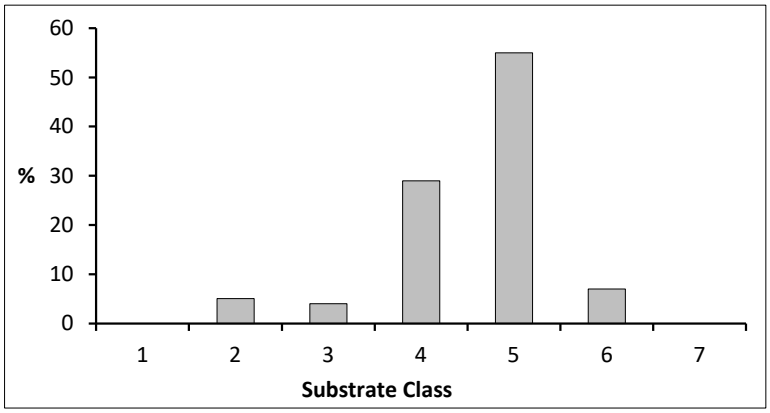
APPENDIX B**:**

Reach Habitat Data
Summary Sheets

Rapid Habitat Assessment and Substrate Summary **West River Phase 2**

Fitzgerald Environmental Associates, LLC. West River

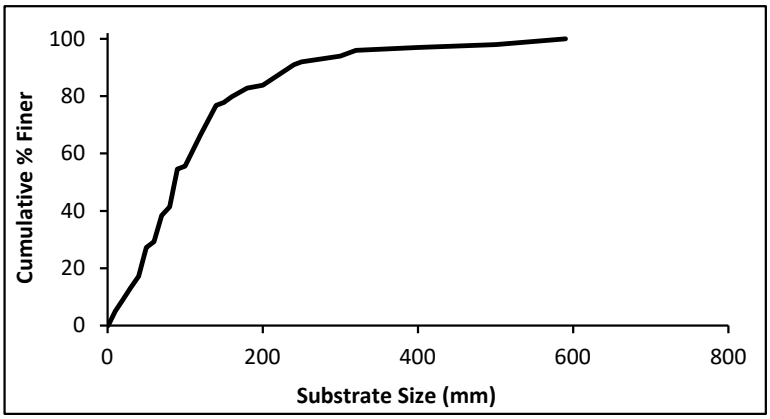
Reach/Segment Information	
SGA ID:	R10.B
Length (ft):	7,032
Reference Bedform Type:	Dune-Ripple
Total RHA Score:	74
RHA Percentage:	46%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	5
F. Gravel	2 - 16	4
C. Gravel	16 - 64	29
Cobble	64 - 256	55
Boulder	256 - 4096	7
Bedrock	> 4096	0

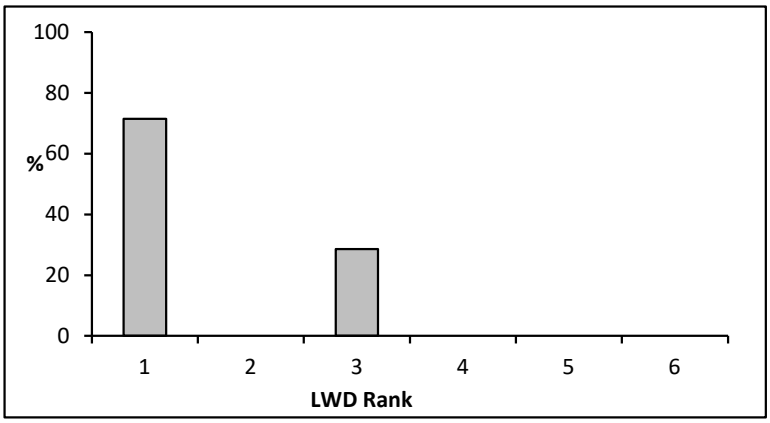
Median Substrate Size:	90	mm
Avg. Largest Particle (Bar):	300	mm
Riffle Stability Index (RSI):	94	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	10
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	4
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

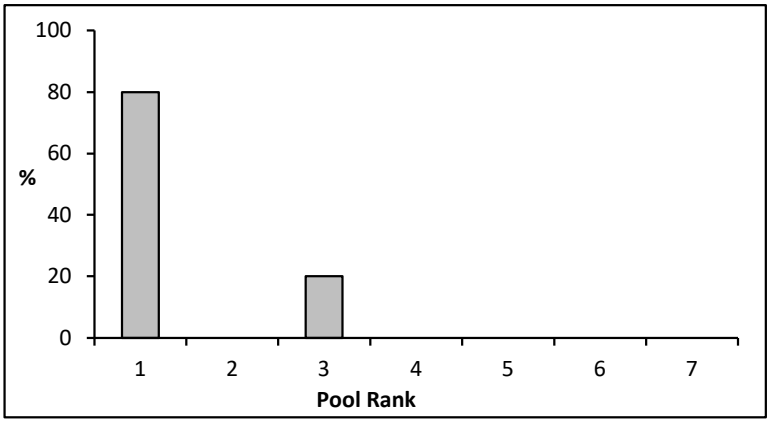
 # LWDs/mile: 11



Pools

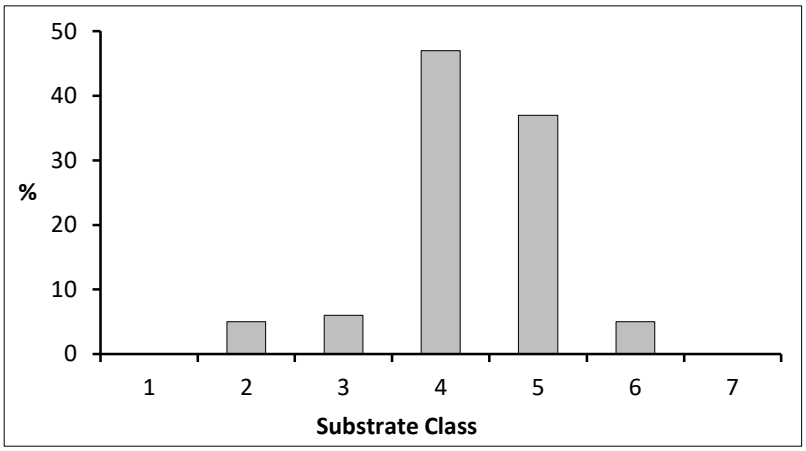
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	4
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	1
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 3.75427



Reach/Segment Information

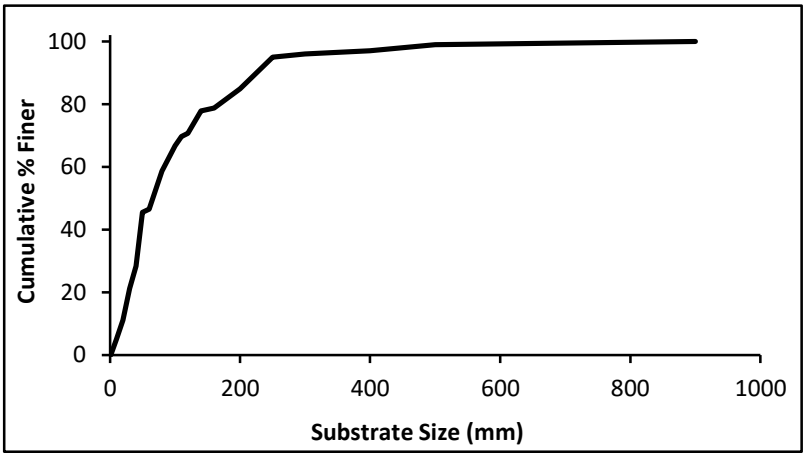
SGA ID:	R11
Length (ft):	5,570
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	83
RHA Percentage:	52%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	5
F. Gravel	2 - 16	6
C. Gravel	16 - 64	47
Cobble	64 - 256	37
Boulder	256 - 4096	5
Bedrock	> 4096	0

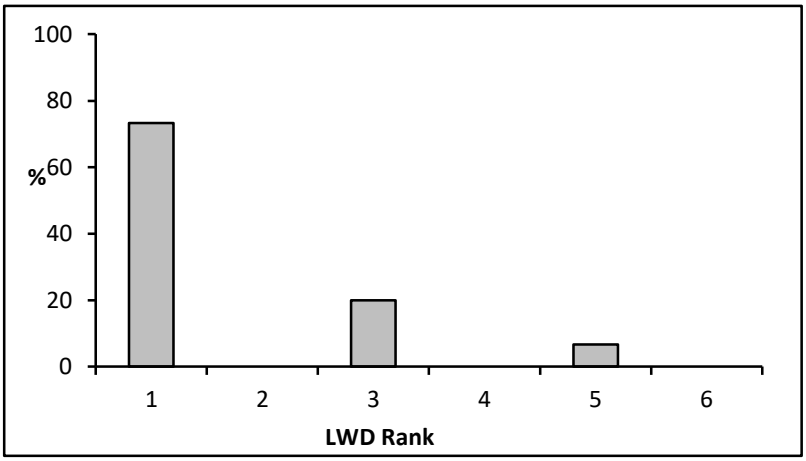
Median Substrate Size:	60	mm
Avg. Largest Particle (Bar):	350	mm
Riffle Stability Index (RSI):	96	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	11
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	3
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	1
6	D ≥ 2.0	≥ 0.5	0

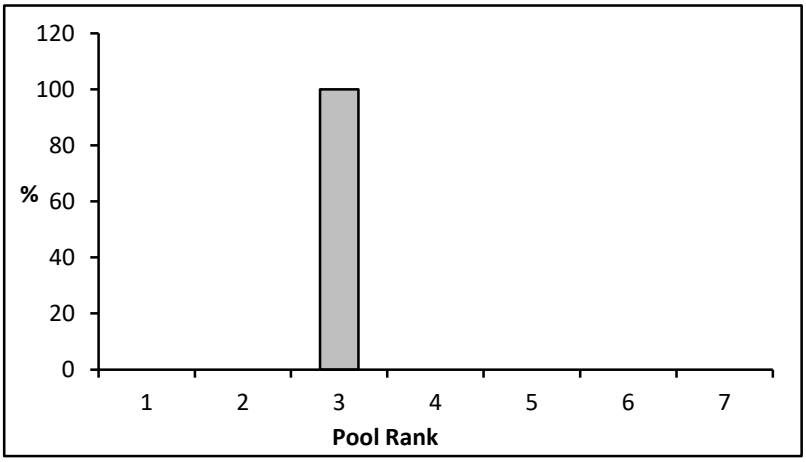
 # LWDs/mile: 14



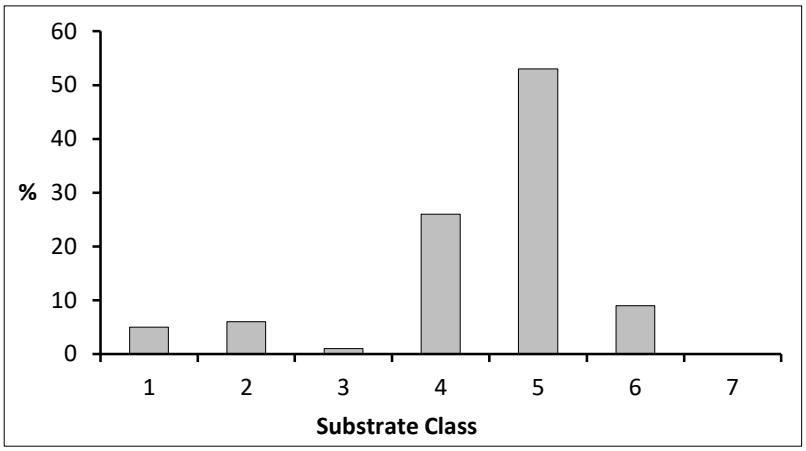
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	1
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0.94794



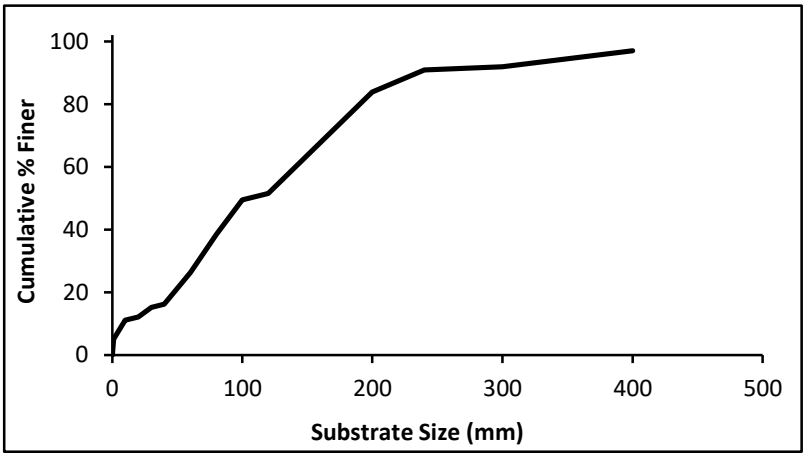
Reach/Segment Information	
SGA ID:	R12
Length (ft):	2,498
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	76
RHA Percentage:	48%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	5
Sand	0.06 - 2	6
F. Gravel	2 - 16	1
C. Gravel	16 - 64	26
Cobble	64 - 256	53
Boulder	256 - 4096	9
Bedrock	> 4096	0

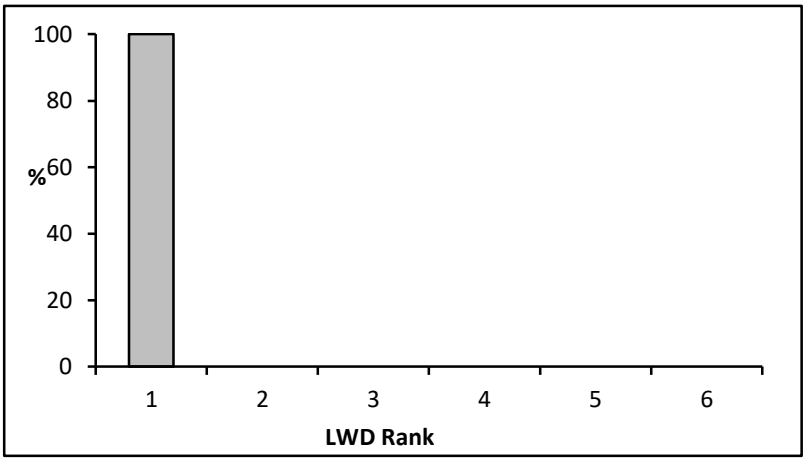
Median Substrate Size:	100	mm
Avg. Largest Particle (Bar):	300	mm
Riffle Stability Index (RSI):	92	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

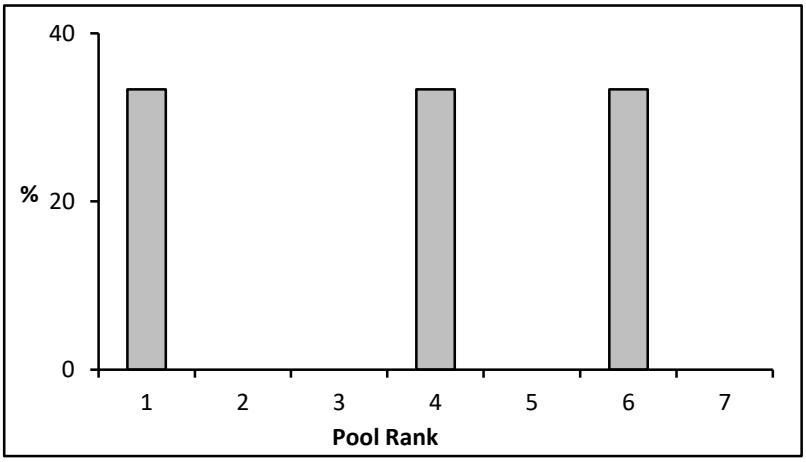
 # LWDs/mile: 2



Pools

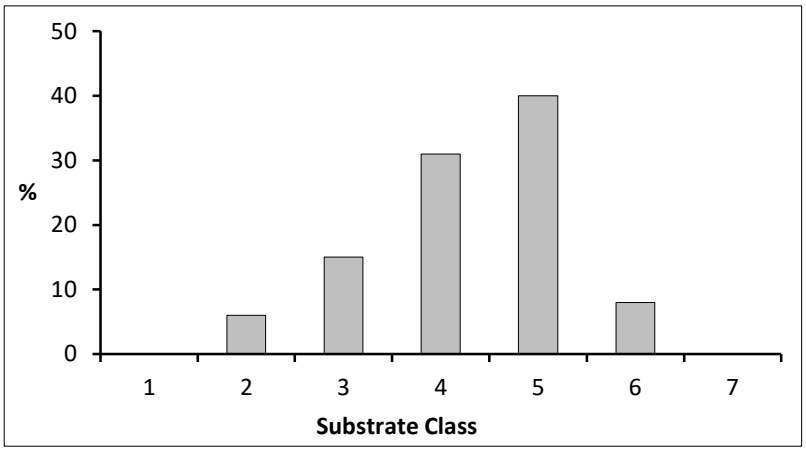
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	1
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 6.34107



Reach/Segment Information

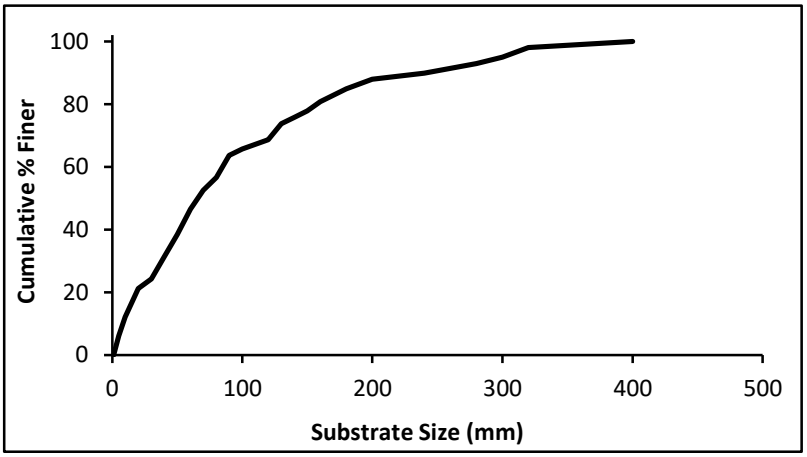
SGA ID:	R13.A
Length (ft):	4,014
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	80
RHA Percentage:	50%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	6
F. Gravel	2 - 16	15
C. Gravel	16 - 64	31
Cobble	64 - 256	40
Boulder	256 - 4096	8
Bedrock	> 4096	0

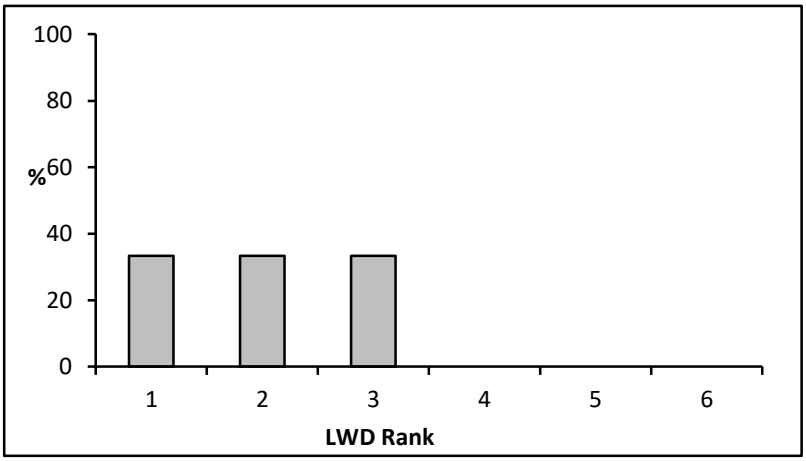
Median Substrate Size:	60	mm
Avg. Largest Particle (Bar):	450	mm
Riffle Stability Index (RSI):	100	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	1
3	1.0 ≤ D < 2.0	< 0.5	1
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

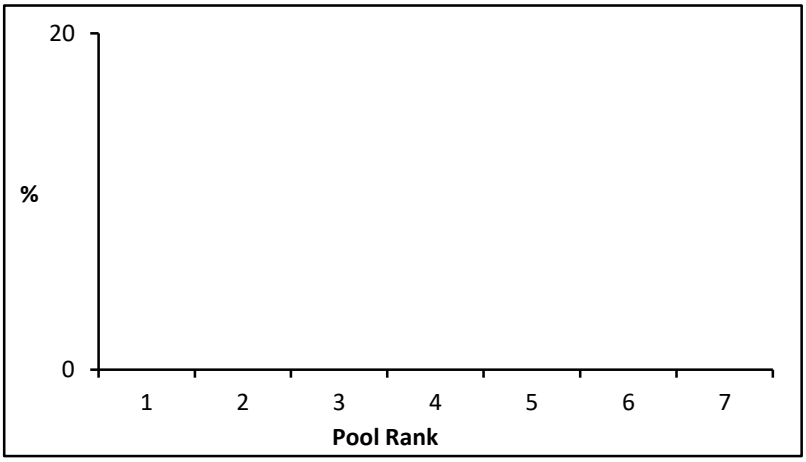
 # LWDs/mile: 4



Pools

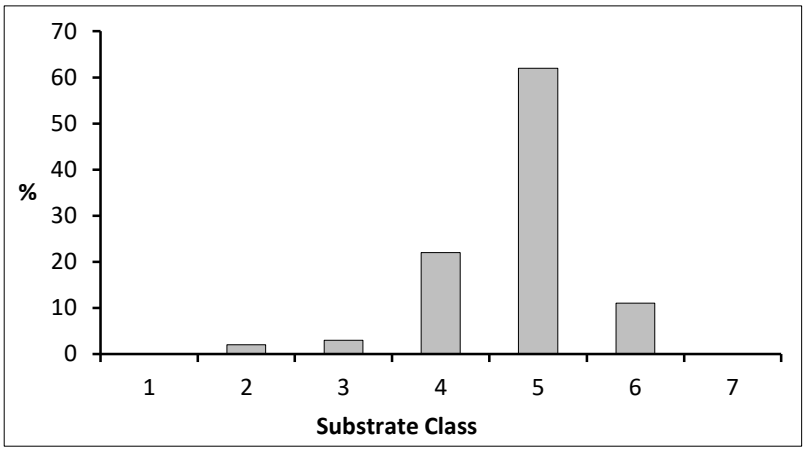
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



Reach/Segment Information

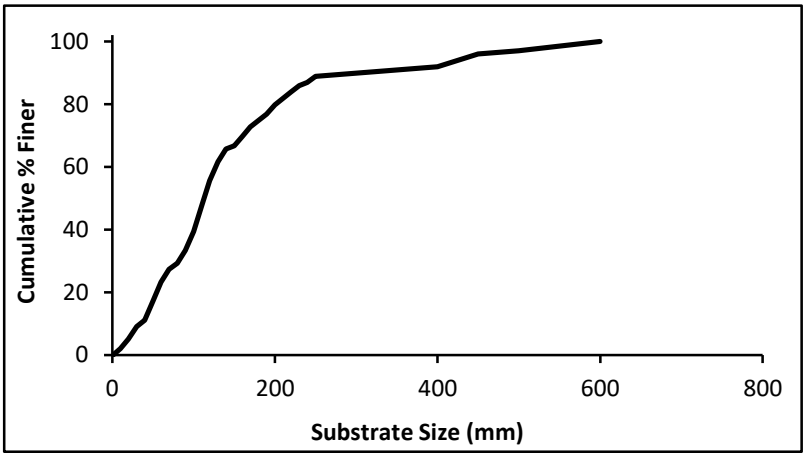
SGA ID:	R13.B
Length (ft):	11,243
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	81
RHA Percentage:	51%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	2
F. Gravel	2 - 16	3
C. Gravel	16 - 64	22
Cobble	64 - 256	62
Boulder	256 - 4096	11
Bedrock	> 4096	0

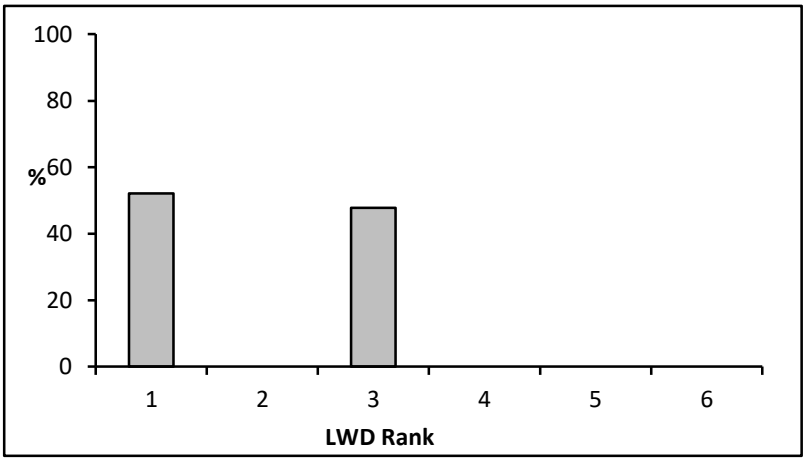
Median Substrate Size:	110	mm
Avg. Largest Particle (Bar):	260	mm
Riffle Stability Index (RSI):	89	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	12
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	11
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

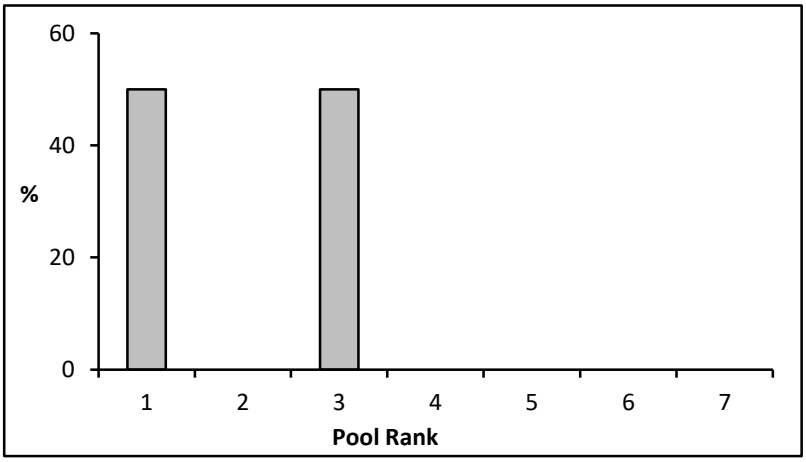
 # LWDs/mile: 11



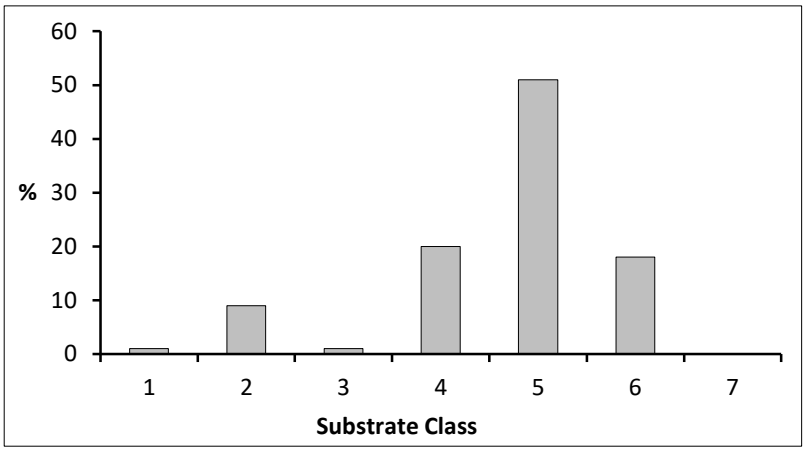
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	1
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0.93925



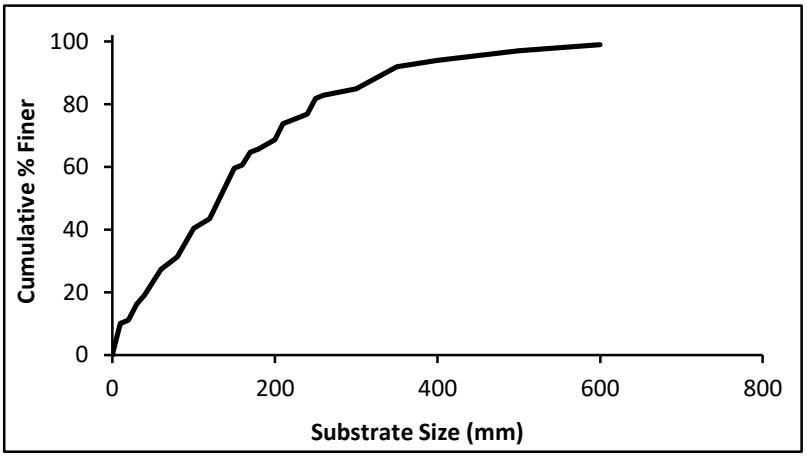
Reach/Segment Information	
SGA ID:	R18
Length (ft):	10,349
Reference Bedform Type:	Cascade
Total RHA Score:	80
RHA Percentage:	50%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	1
Sand	0.06 - 2	9
F. Gravel	2 - 16	1
C. Gravel	16 - 64	20
Cobble	64 - 256	51
Boulder	256 - 4096	18
Bedrock	> 4096	0

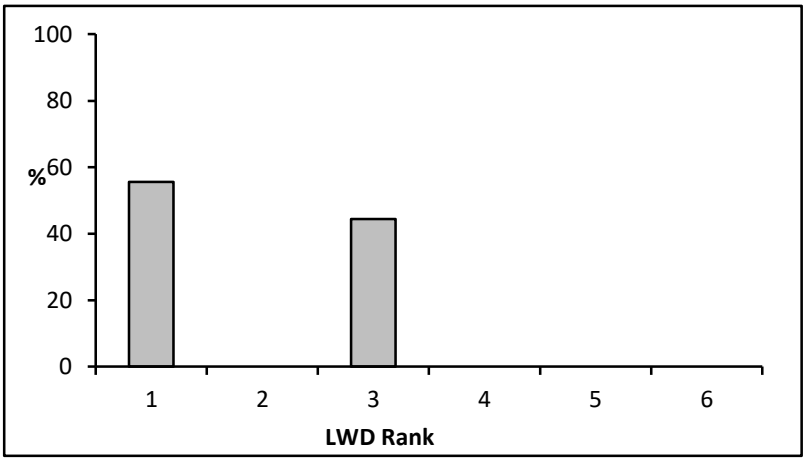
Median Substrate Size:	120	mm
Avg. Largest Particle (Bar):	300	mm
Riffle Stability Index (RSI):	85	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	5
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	4
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

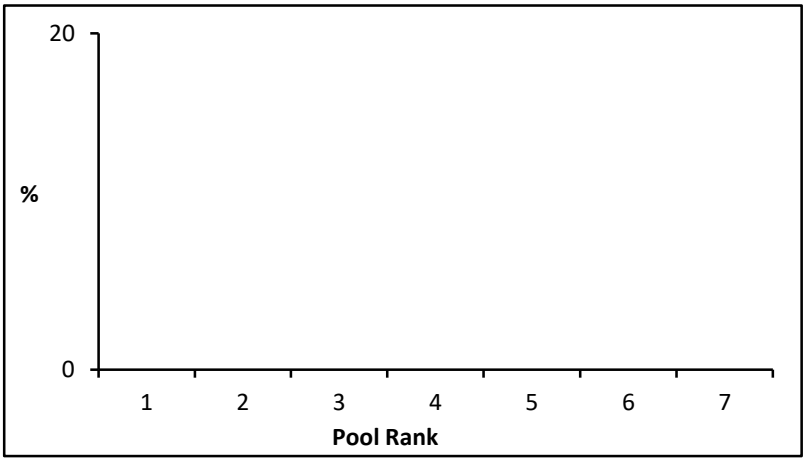
 # LWDs/mile: 5



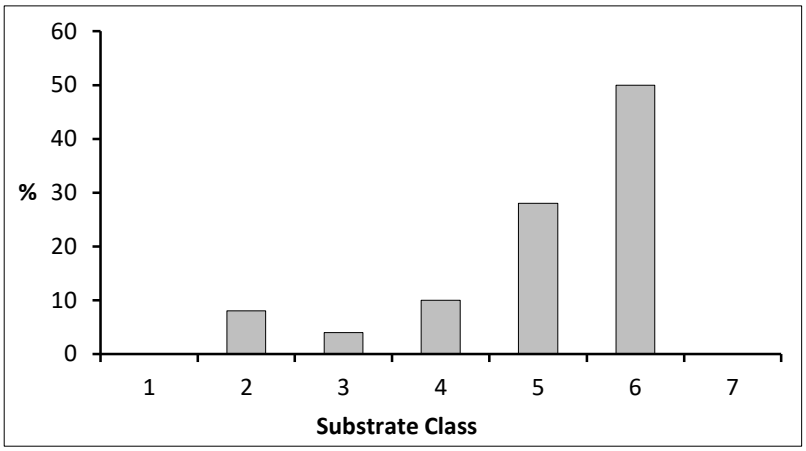
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



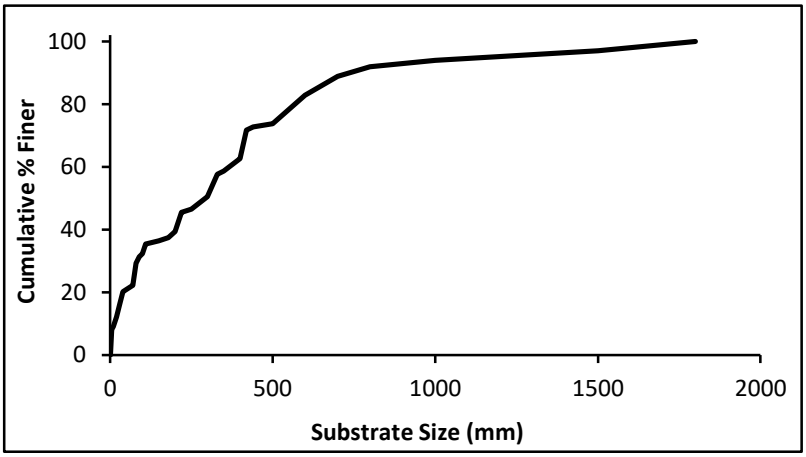
Reach/Segment Information	
SGA ID:	R19.A
Length (ft):	1,710
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	68
RHA Percentage:	43%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	8
F. Gravel	2 - 16	4
C. Gravel	16 - 64	10
Cobble	64 - 256	28
Boulder	256 - 4096	50
Bedrock	> 4096	0

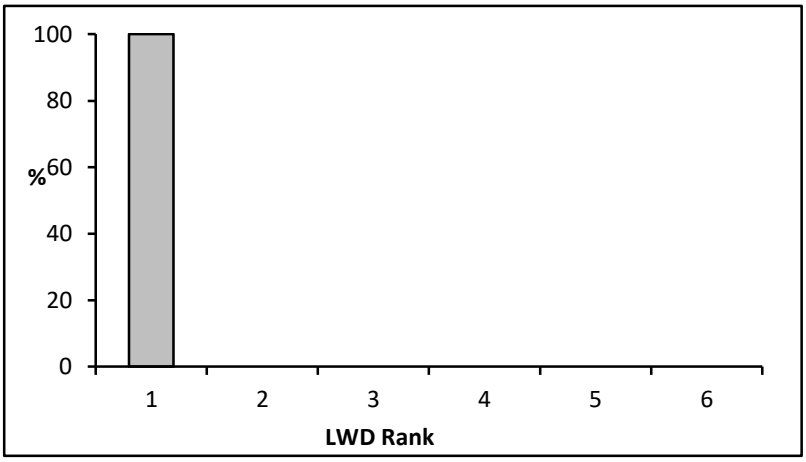
Median Substrate Size:	275	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	32	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	2
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

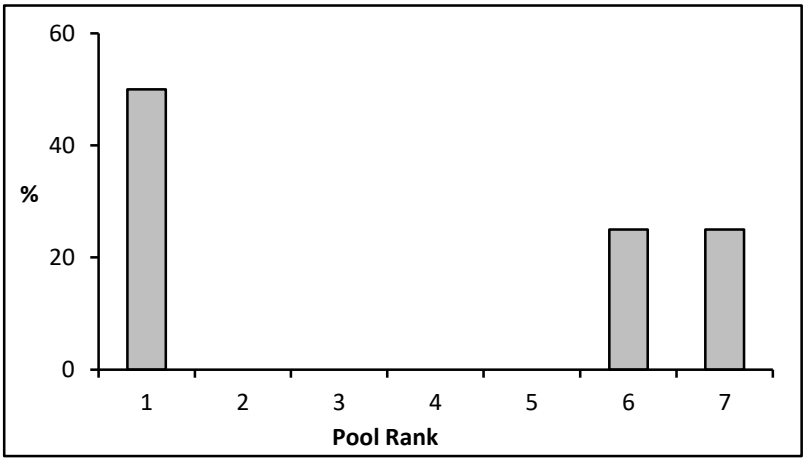
 # LWDs/mile: 6



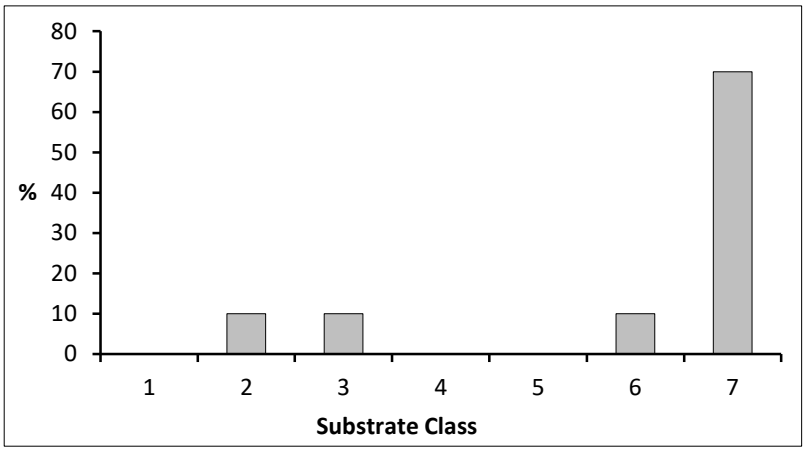
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	1
7	D ≥ 3.0	≥ 1.0	1

 # Pools/mile: 12.3509



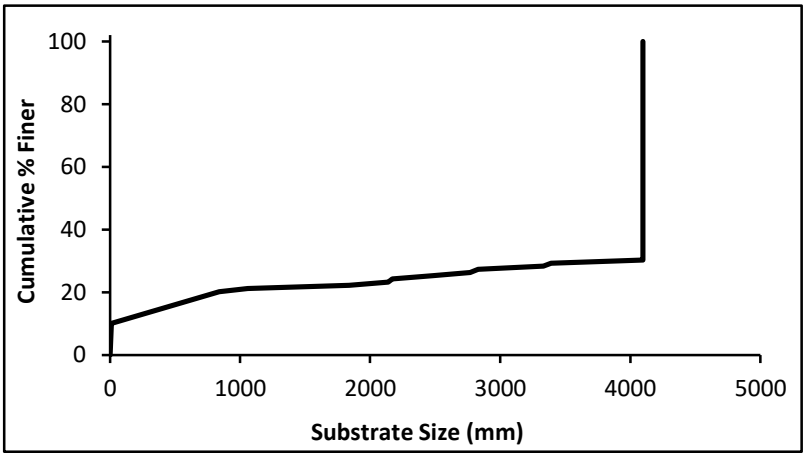
Reach/Segment Information	
SGA ID:	R19.B
Length (ft):	3,205
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	50
RHA Percentage:	31%
Overall Habitat Condition:	Poor



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	10
F. Gravel	2 - 16	10
C. Gravel	16 - 64	0
Cobble	64 - 256	0
Boulder	256 - 4096	10
Bedrock	> 4096	70

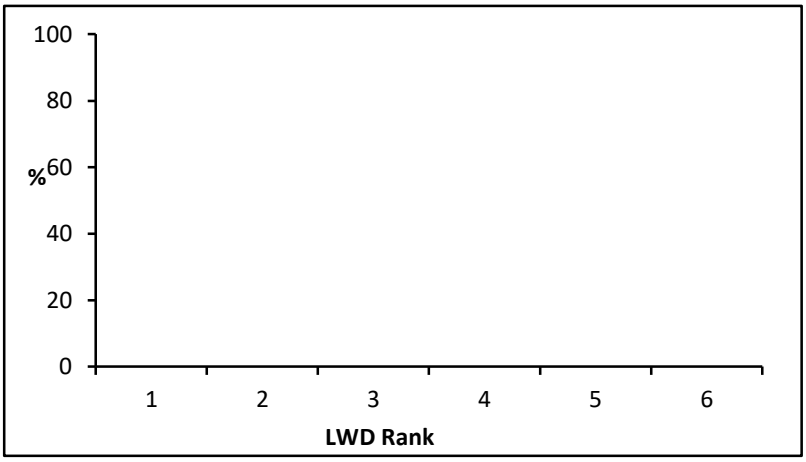
Median Substrate Size:	4096	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	NA	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	0
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

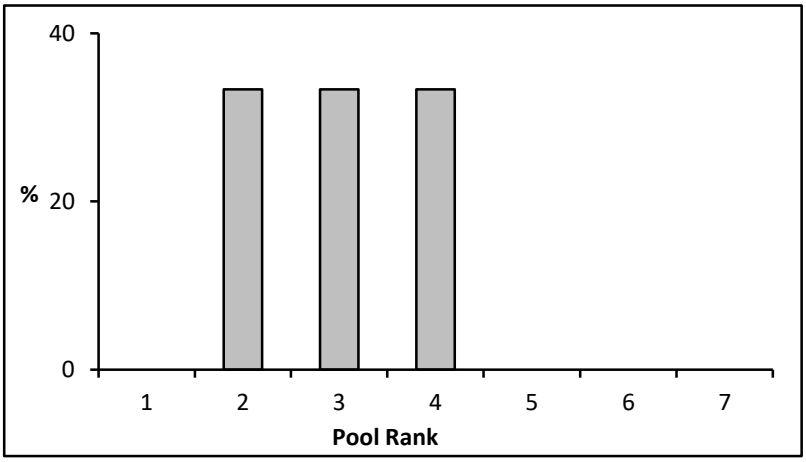
 # LWDs/mile: 0



Pools

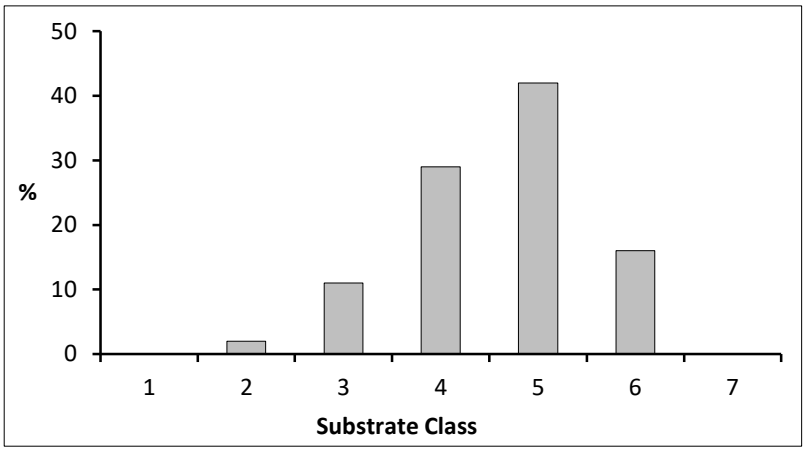
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	1
3	2.0 ≤ D < 3.0	< 0.5	1
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 4.94228



Reach/Segment Information

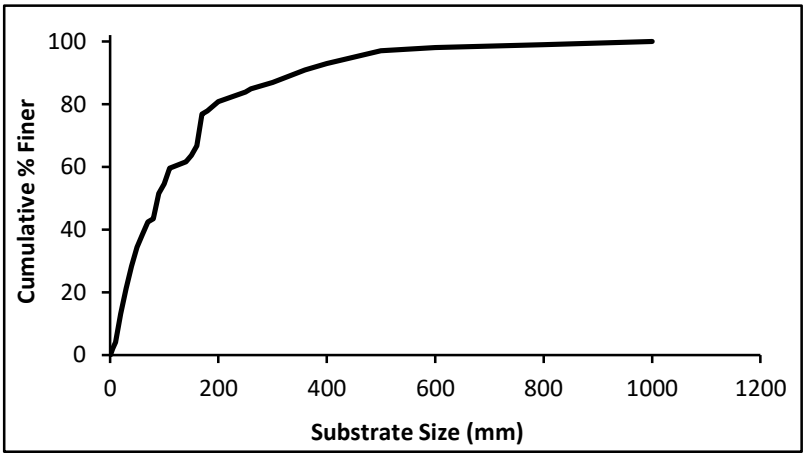
SGA ID:	R19.C
Length (ft):	9,046
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	94
RHA Percentage:	59%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	2
F. Gravel	2 - 16	11
C. Gravel	16 - 64	29
Cobble	64 - 256	42
Boulder	256 - 4096	16
Bedrock	> 4096	0

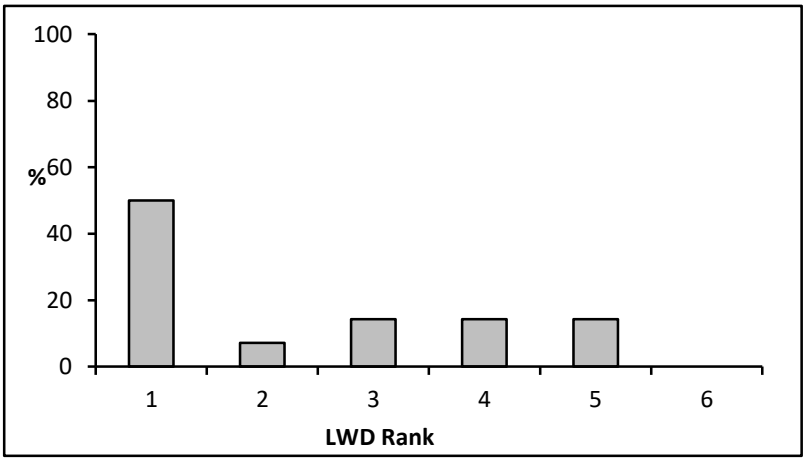
Median Substrate Size:	80	mm
Avg. Largest Particle (Bar):	80	mm
Riffle Stability Index (RSI):	43	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	7
2	0.5 ≤ D < 1.0	≥ 0.5	1
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	2
5	D ≥ 2.0	< 0.5	2
6	D ≥ 2.0	≥ 0.5	0

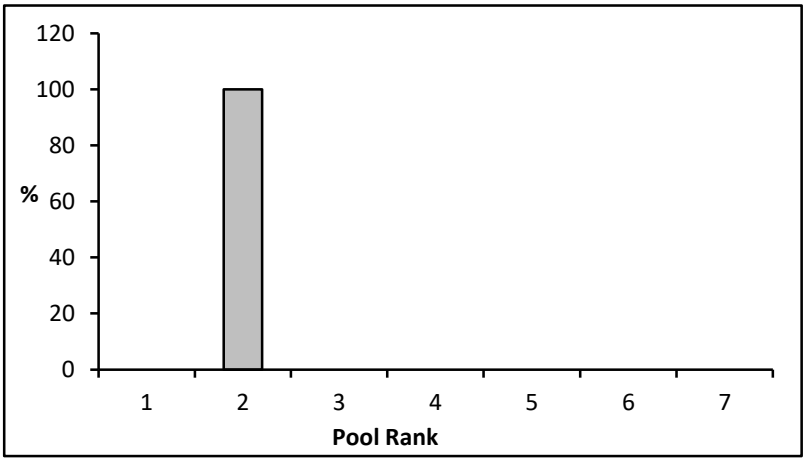
 # LWDs/mile: 8



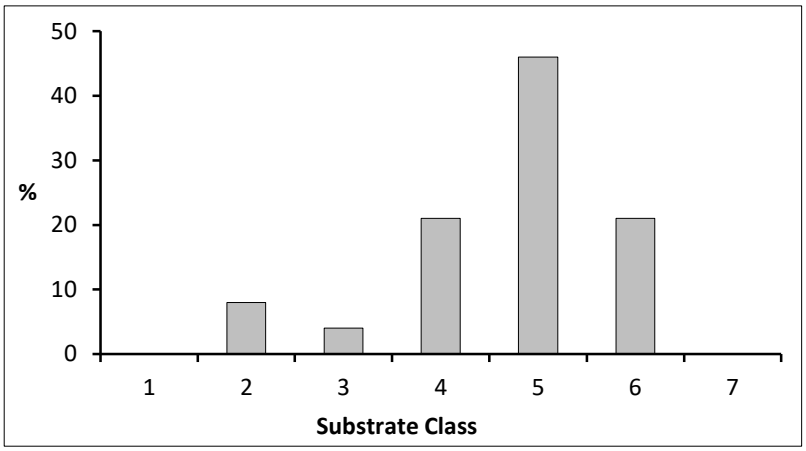
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	2
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 1.16737



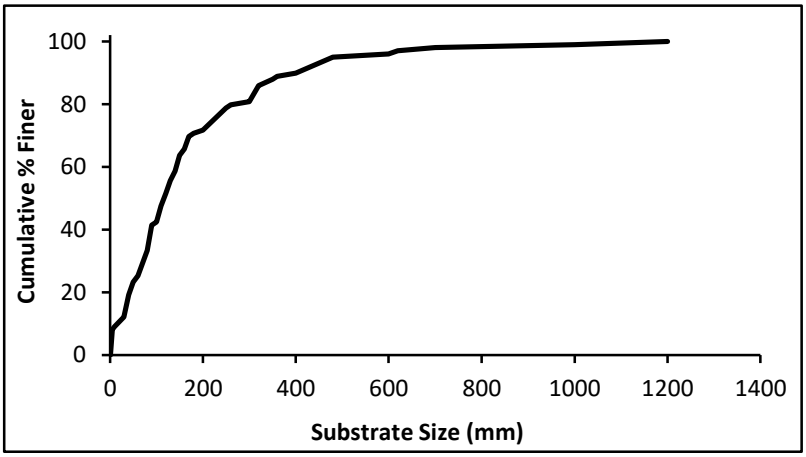
Reach/Segment Information	
SGA ID:	R20
Length (ft):	6,024
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	65
RHA Percentage:	41%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	8
F. Gravel	2 - 16	4
C. Gravel	16 - 64	21
Cobble	64 - 256	46
Boulder	256 - 4096	21
Bedrock	> 4096	0

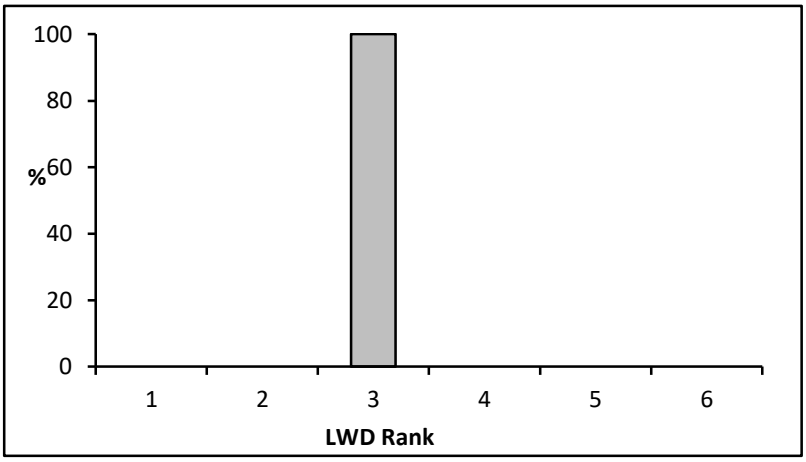
Median Substrate Size:	110	mm
Avg. Largest Particle (Bar):	200	mm
Riffle Stability Index (RSI):	72	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	0
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

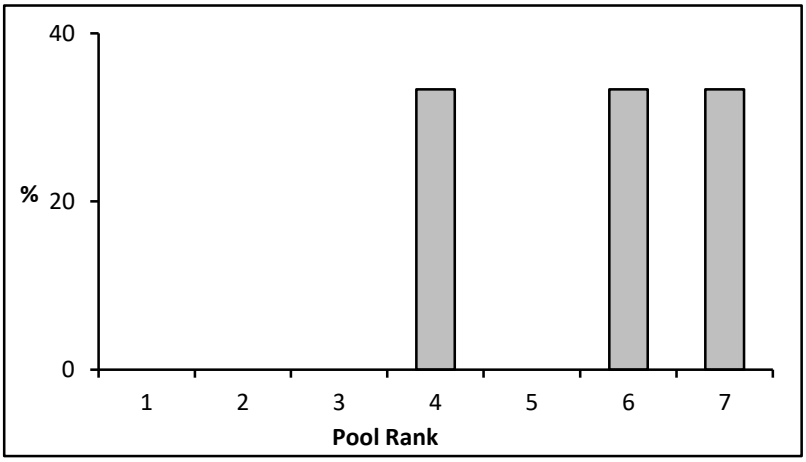
 # LWDs/mile: 2



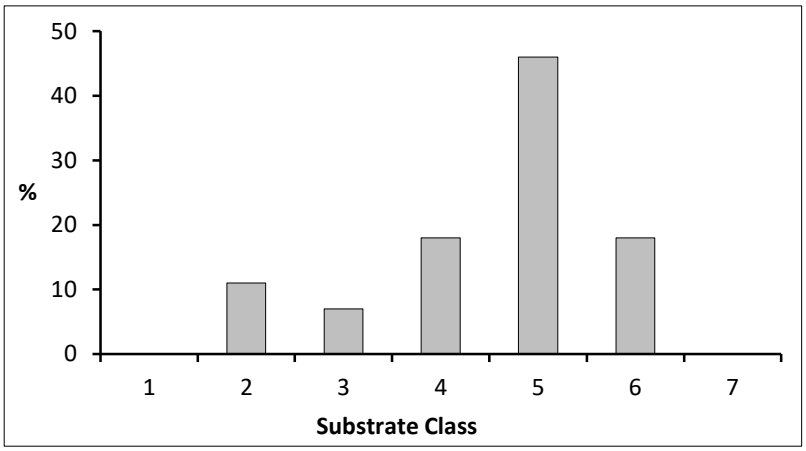
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	1
7	D ≥ 3.0	≥ 1.0	1

 # Pools/mile: 2.62948



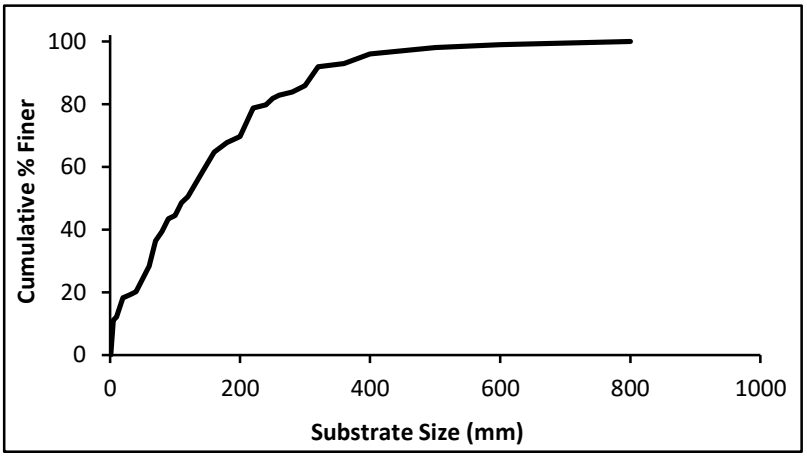
Reach/Segment Information	
SGA ID:	R21
Length (ft):	3,191
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	66
RHA Percentage:	41%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	11
F. Gravel	2 - 16	7
C. Gravel	16 - 64	18
Cobble	64 - 256	46
Boulder	256 - 4096	18
Bedrock	> 4096	0

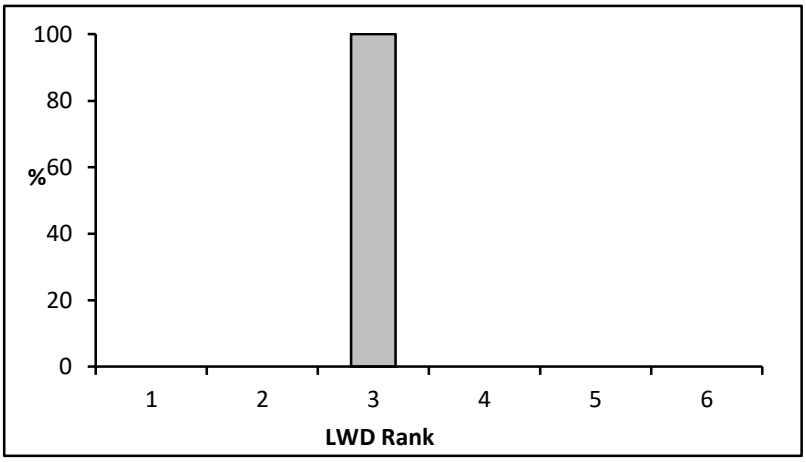
Median Substrate Size:	115	mm
Avg. Largest Particle (Bar):	60	mm
Riffle Stability Index (RSI):	28	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	0
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

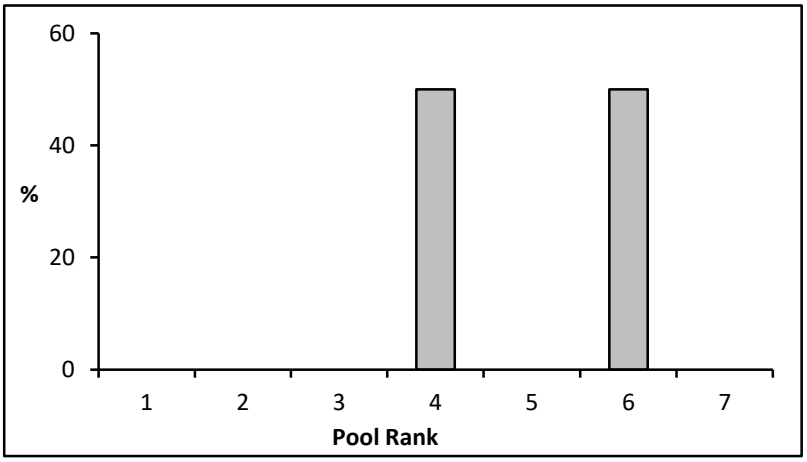
 # LWDs/mile: 3



Pools

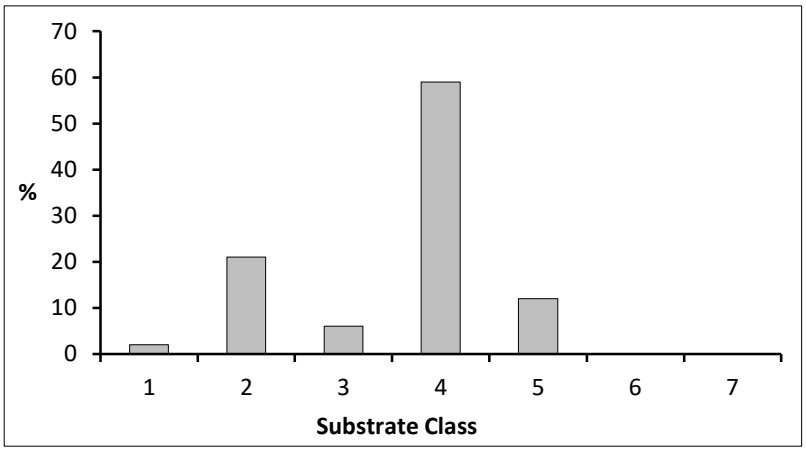
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	1
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 3.30931



Reach/Segment Information

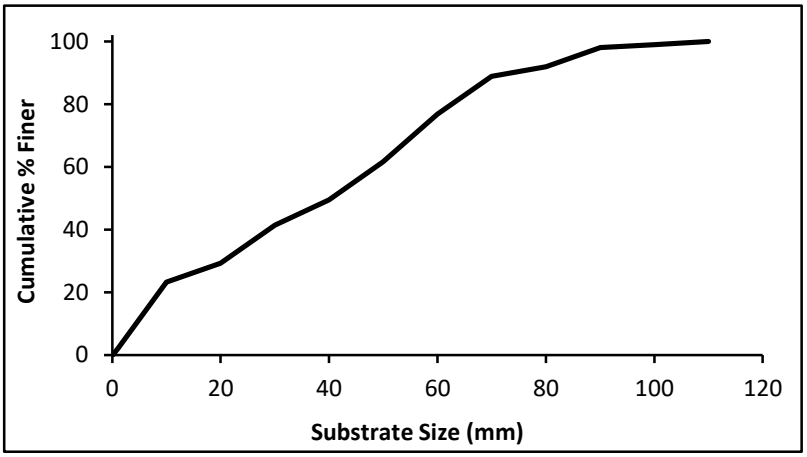
SGA ID:	R22.B
Length (ft):	1,210
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	61
RHA Percentage:	38%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	2
Sand	0.06 - 2	21
F. Gravel	2 - 16	6
C. Gravel	16 - 64	59
Cobble	64 - 256	12
Boulder	256 - 4096	0
Bedrock	> 4096	0

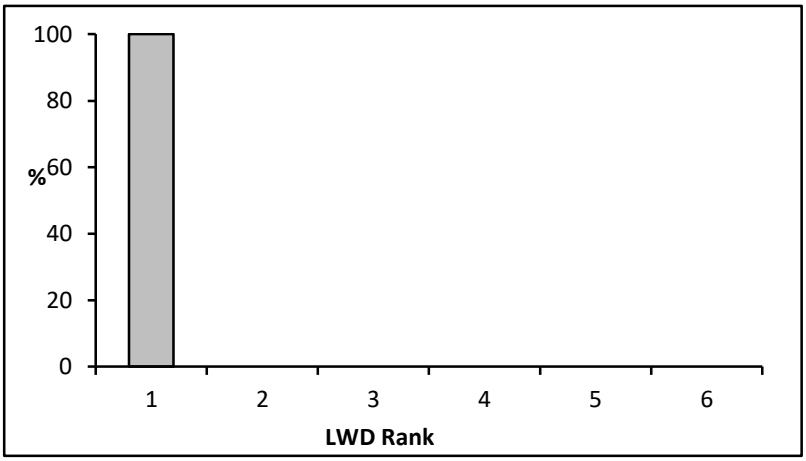
Median Substrate Size:	40	mm
Avg. Largest Particle (Bar):	60	mm
Riffle Stability Index (RSI):	77	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	3
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

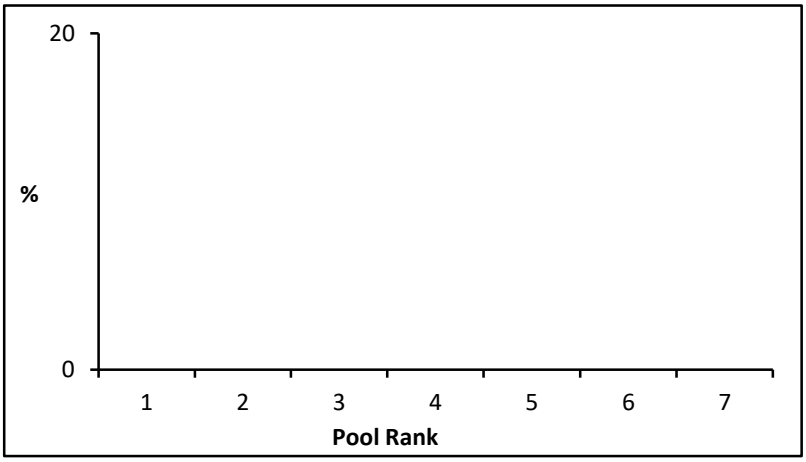
 # LWDs/mile: 13



Pools

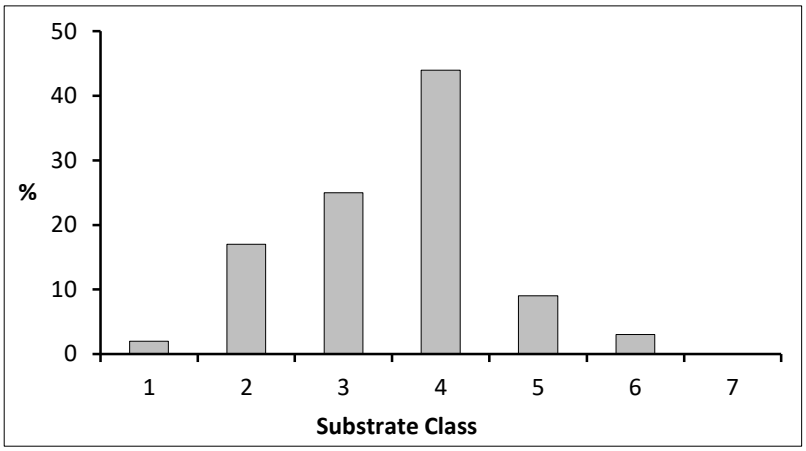
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



Reach/Segment Information

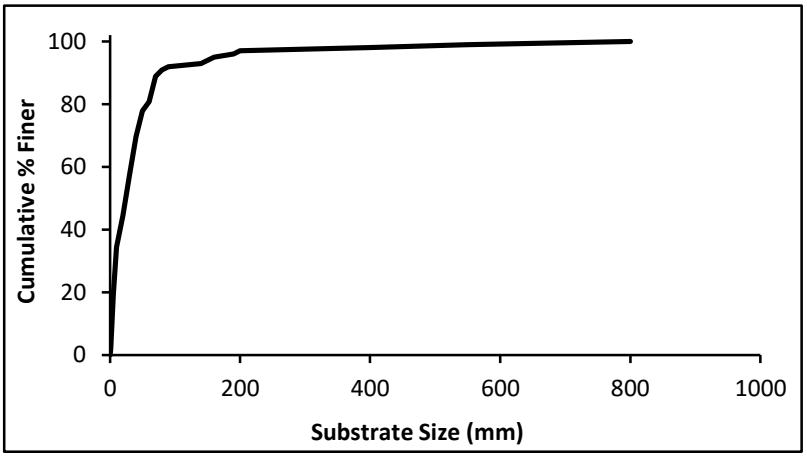
SGA ID:	R23
Length (ft):	5,084
Reference Bedform Type:	Riffle Pool
Total RHA Score:	81
RHA Percentage:	51%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	2
Sand	0.06 - 2	17
F. Gravel	2 - 16	25
C. Gravel	16 - 64	44
Cobble	64 - 256	9
Boulder	256 - 4096	3
Bedrock	> 4096	0

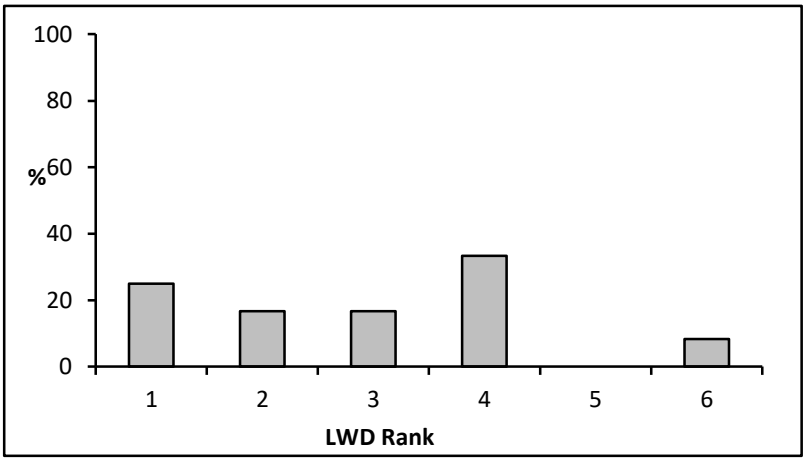
Median Substrate Size:	20	mm
Avg. Largest Particle (Bar):	50	mm
Riffle Stability Index (RSI):	78	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	3
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	4
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	1

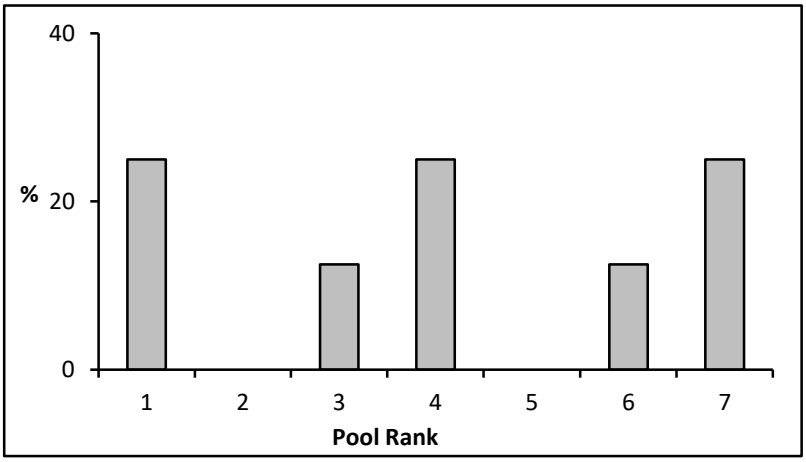
 # LWDs/mile: 12



Pools

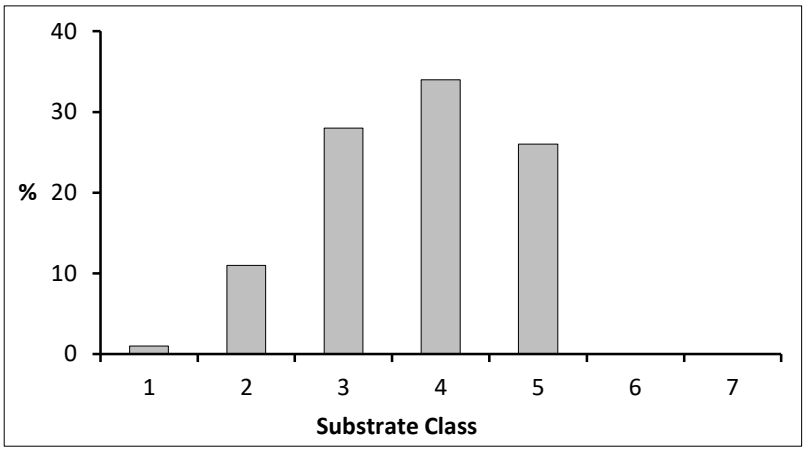
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	1
4	2.0 ≤ D < 3.0	≥ 0.5	2
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	1
7	D ≥ 3.0	≥ 1.0	2

 # Pools/mile: 8.30842



Reach/Segment Information

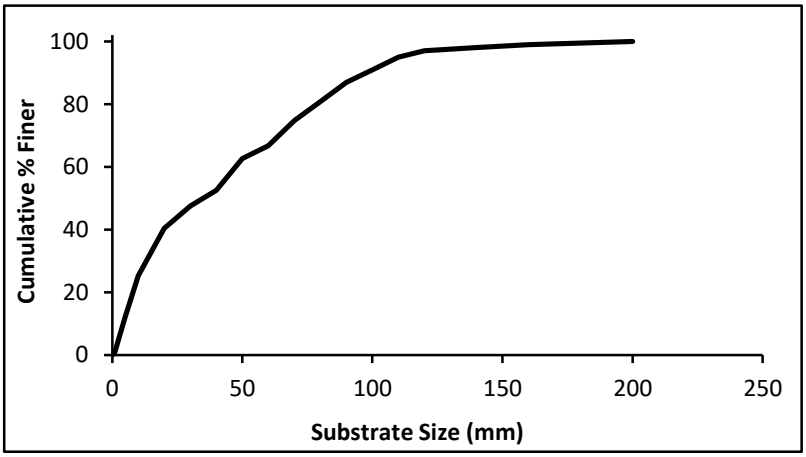
SGA ID:	R24.A
Length (ft):	3,039
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	82
RHA Percentage:	51%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	1
Sand	0.06 - 2	11
F. Gravel	2 - 16	28
C. Gravel	16 - 64	34
Cobble	64 - 256	26
Boulder	256 - 4096	0
Bedrock	> 4096	0

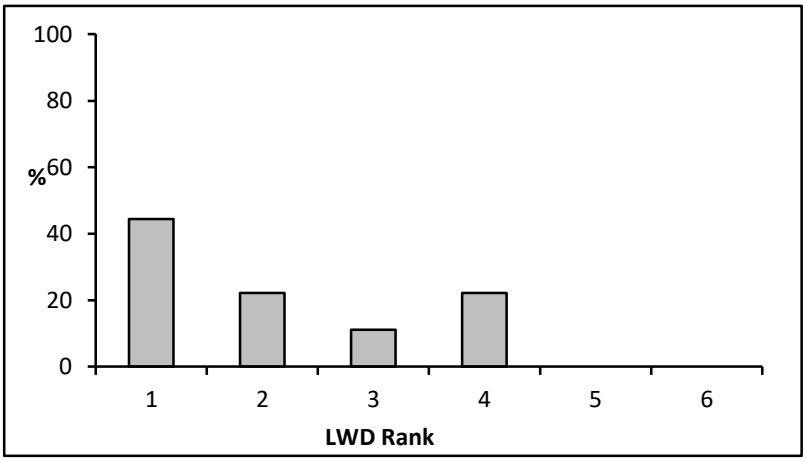
Median Substrate Size:	30	mm
Avg. Largest Particle (Bar):	80	mm
Riffle Stability Index (RSI):	81	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	4
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	1
4	1.0 ≤ D < 2.0	≥ 0.5	2
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

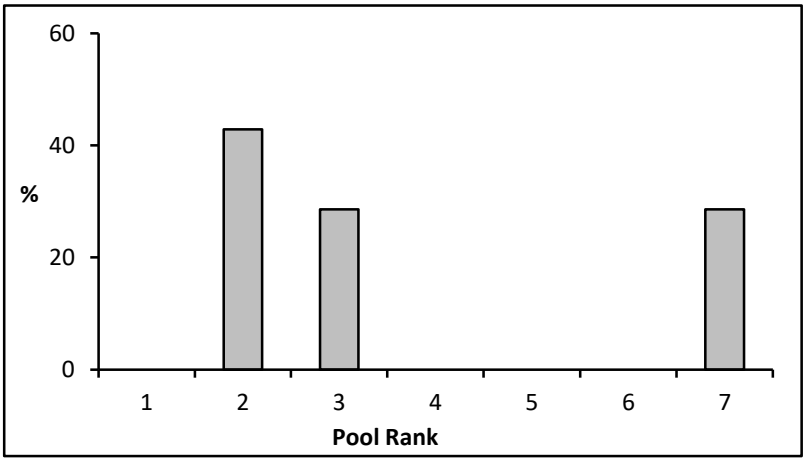
 # LWDs/mile: 16



Pools

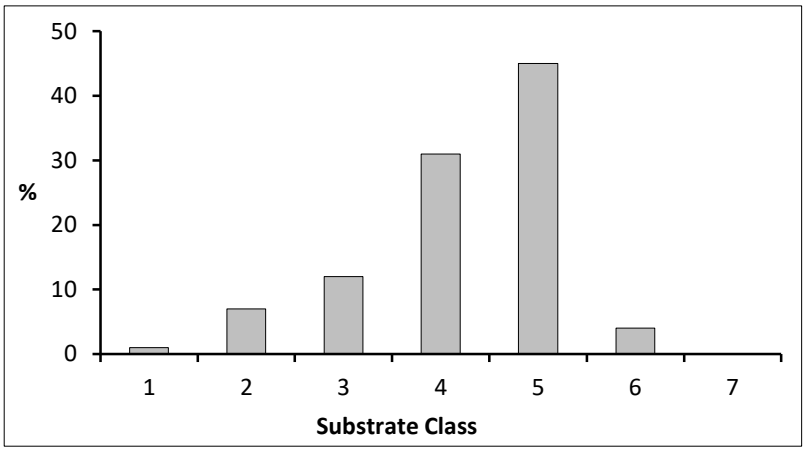
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	3
3	2.0 ≤ D < 3.0	< 0.5	2
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	2

 # Pools/mile: 12.1619



Reach/Segment Information

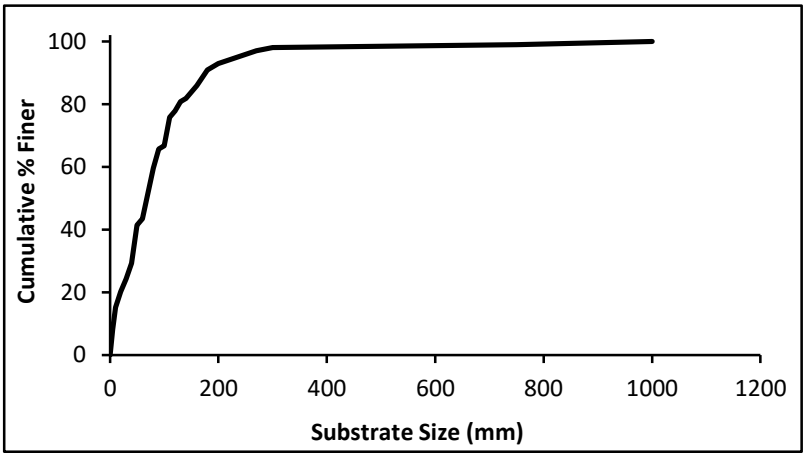
SGA ID:	R24.B
Length (ft):	4,394
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	71
RHA Percentage:	44%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	1
Sand	0.06 - 2	7
F. Gravel	2 - 16	12
C. Gravel	16 - 64	31
Cobble	64 - 256	45
Boulder	256 - 4096	4
Bedrock	> 4096	0

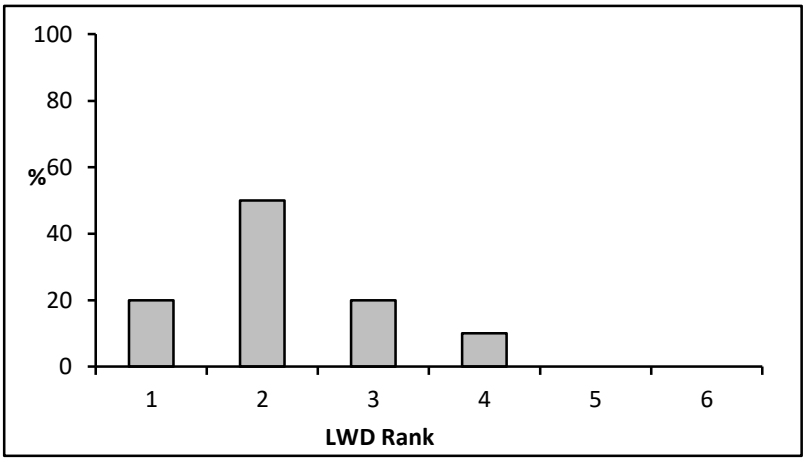
Median Substrate Size:	60	mm
Avg. Largest Particle (Bar):	60	mm
Riffle Stability Index (RSI):	43	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	2
2	0.5 ≤ D < 1.0	≥ 0.5	5
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	1
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

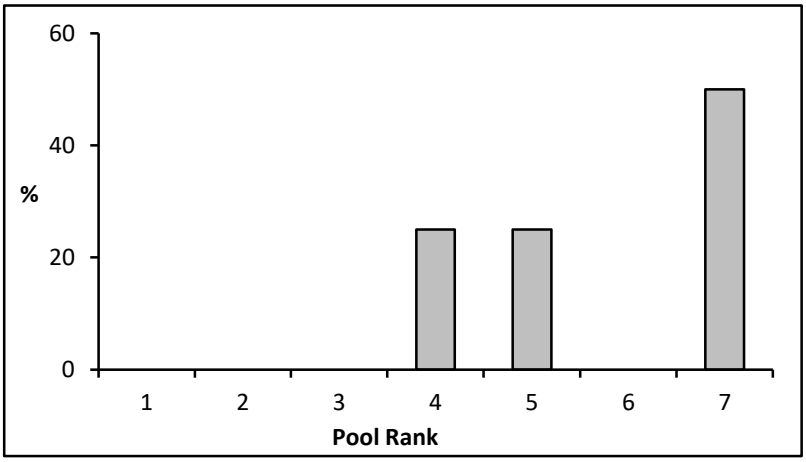
 # LWDs/mile: 12



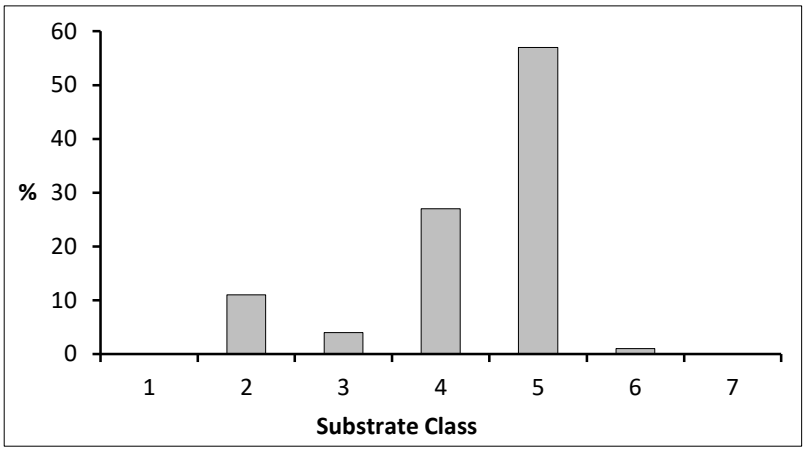
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	1
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	2

 # Pools/mile: 4.80655



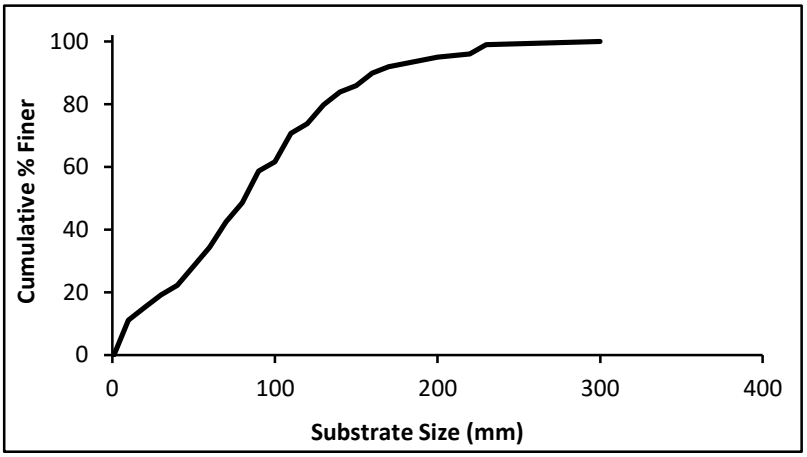
Reach/Segment Information	
SGA ID:	R25.A
Length (ft):	2,935
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	81
RHA Percentage:	51%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	11
F. Gravel	2 - 16	4
C. Gravel	16 - 64	27
Cobble	64 - 256	57
Boulder	256 - 4096	1
Bedrock	> 4096	0

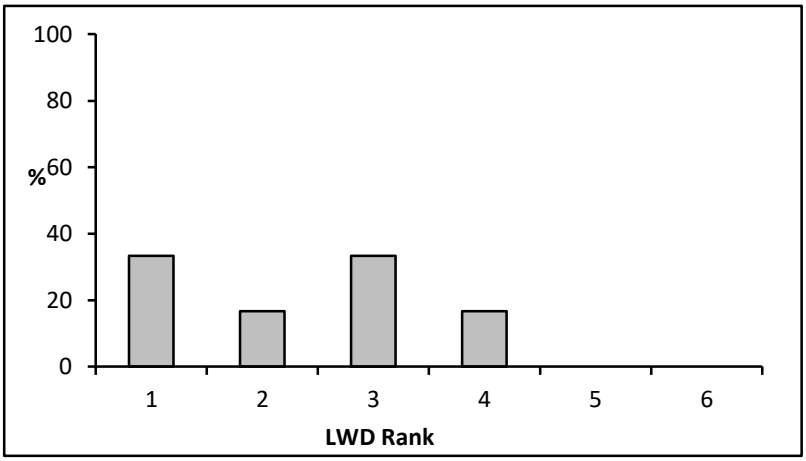
Median Substrate Size:	80	mm
Avg. Largest Particle (Bar):	160	mm
Riffle Stability Index (RSI):	90	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	4
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	4
4	1.0 ≤ D < 2.0	≥ 0.5	2
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

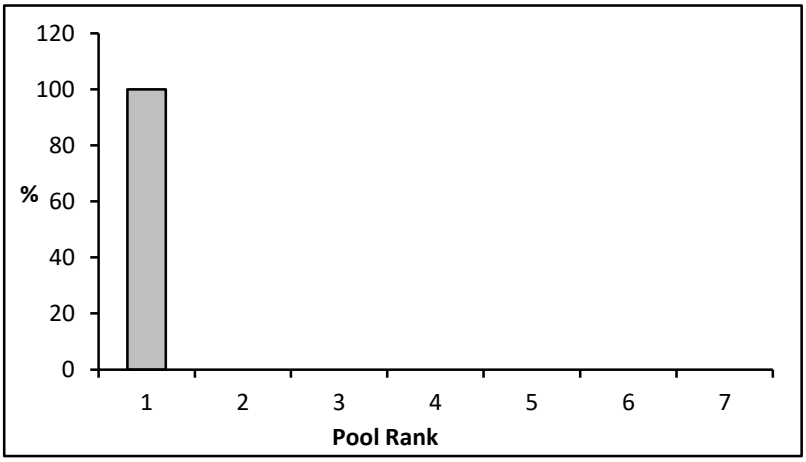
 # LWDs/mile: 22



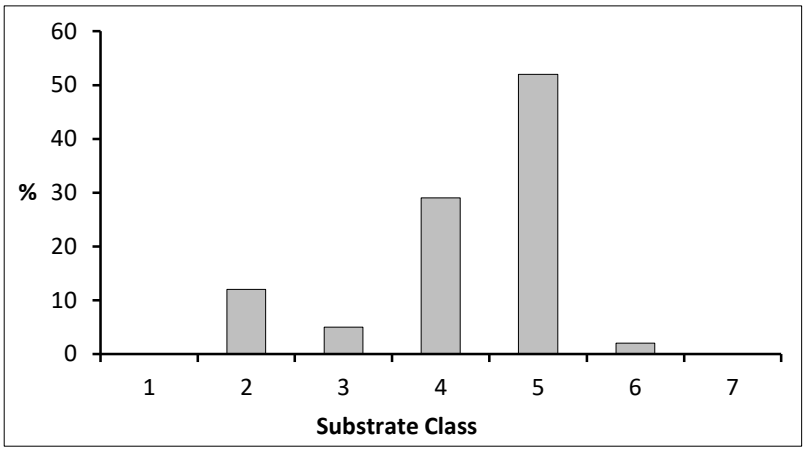
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 1.79898



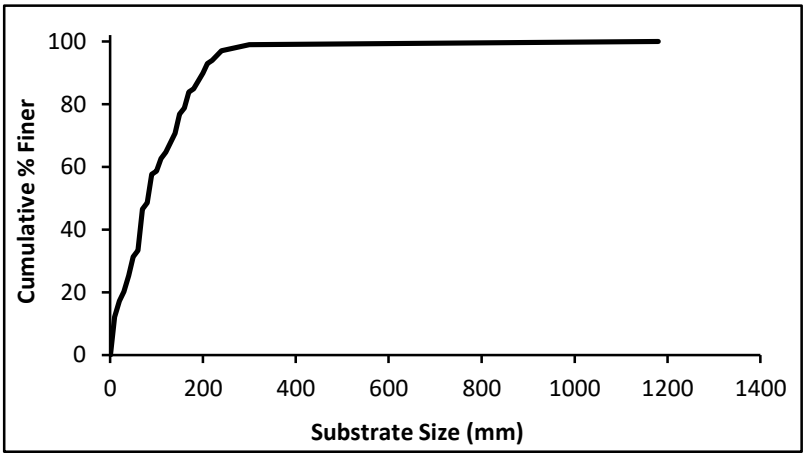
Reach/Segment Information	
SGA ID:	R25.B
Length (ft):	3,321
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	82
RHA Percentage:	51%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	12
F. Gravel	2 - 16	5
C. Gravel	16 - 64	29
Cobble	64 - 256	52
Boulder	256 - 4096	2
Bedrock	> 4096	0

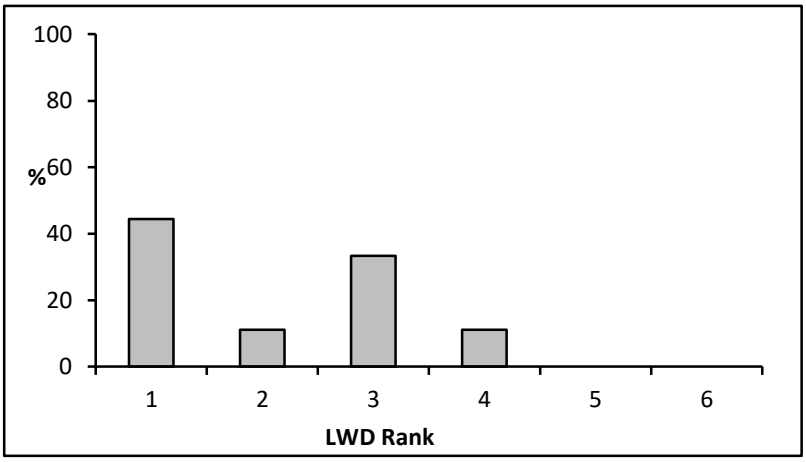
Median Substrate Size:	80	mm
Avg. Largest Particle (Bar):	200	mm
Riffle Stability Index (RSI):	90	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	8
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	6
4	1.0 ≤ D < 2.0	≥ 0.5	2
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

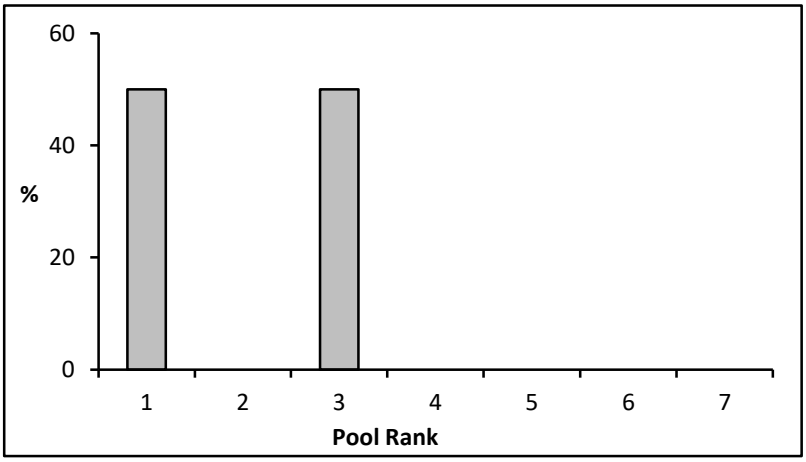
 # LWDs/mile: 29



Pools

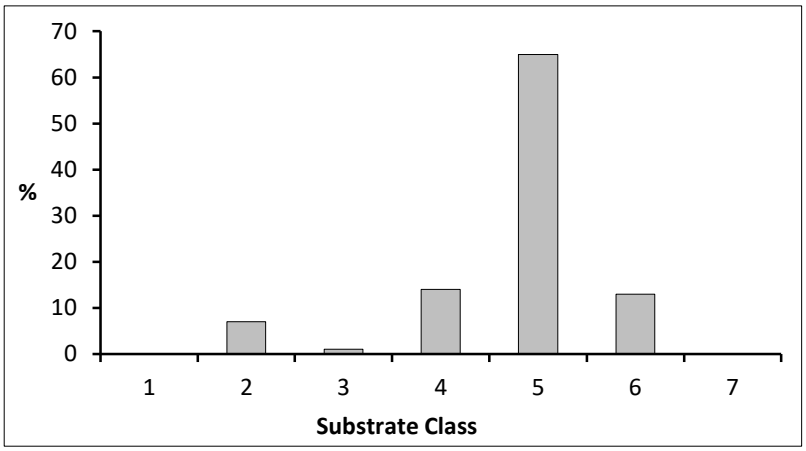
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	1
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 3.17977



Reach/Segment Information

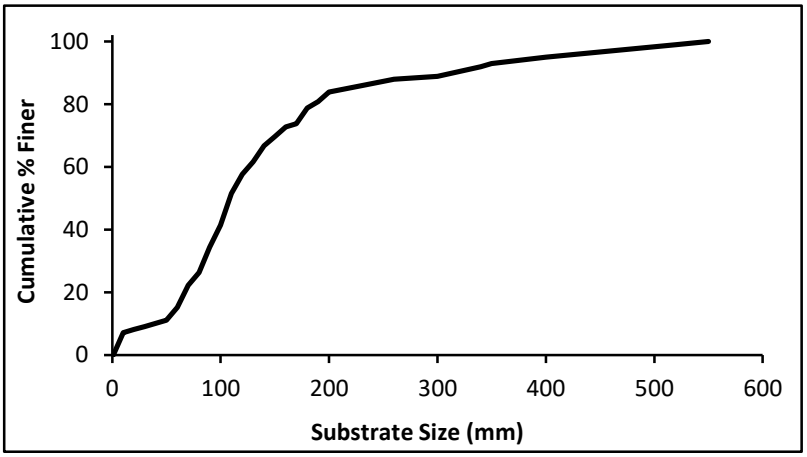
SGA ID:	R25.C
Length (ft):	4,221
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	80
RHA Percentage:	50%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	7
F. Gravel	2 - 16	1
C. Gravel	16 - 64	14
Cobble	64 - 256	65
Boulder	256 - 4096	13
Bedrock	> 4096	0

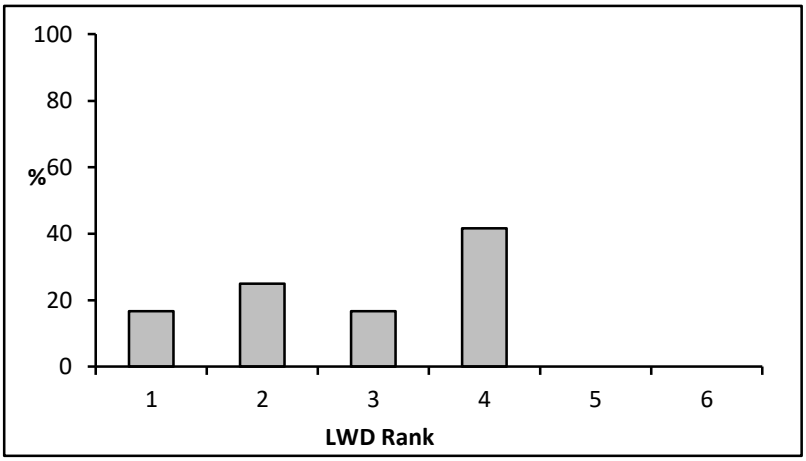
Median Substrate Size:	100	mm
Avg. Largest Particle (Bar):	300	mm
Riffle Stability Index (RSI):	89	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	2
2	0.5 ≤ D < 1.0	≥ 0.5	3
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	5
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

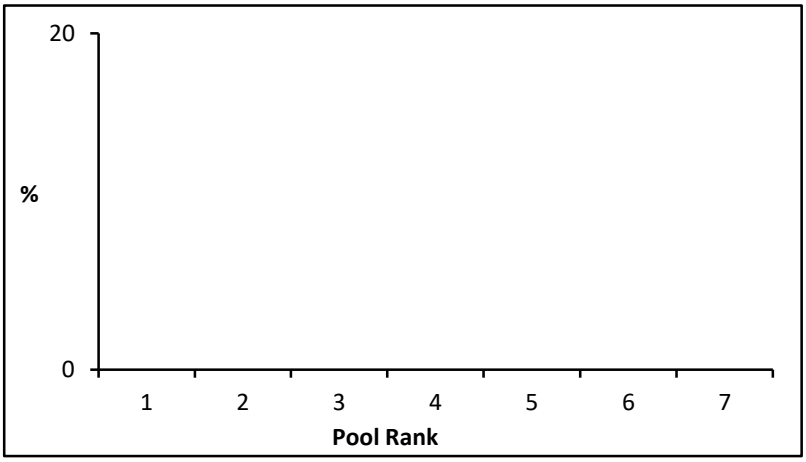
 # LWDs/mile: 15



Pools

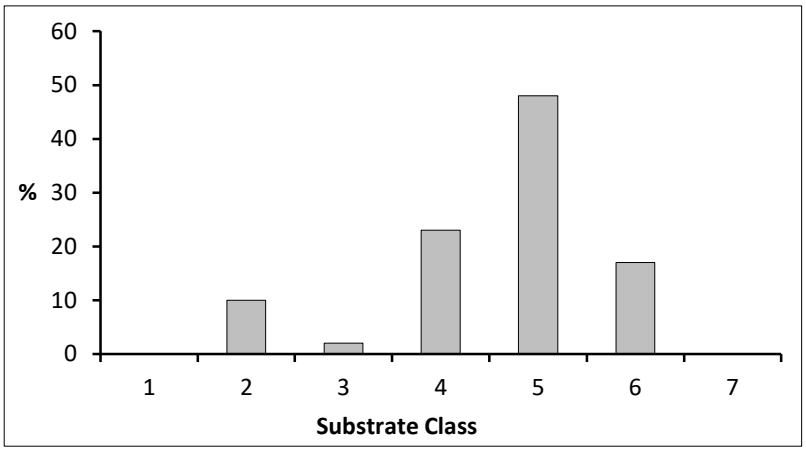
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



Reach/Segment Information

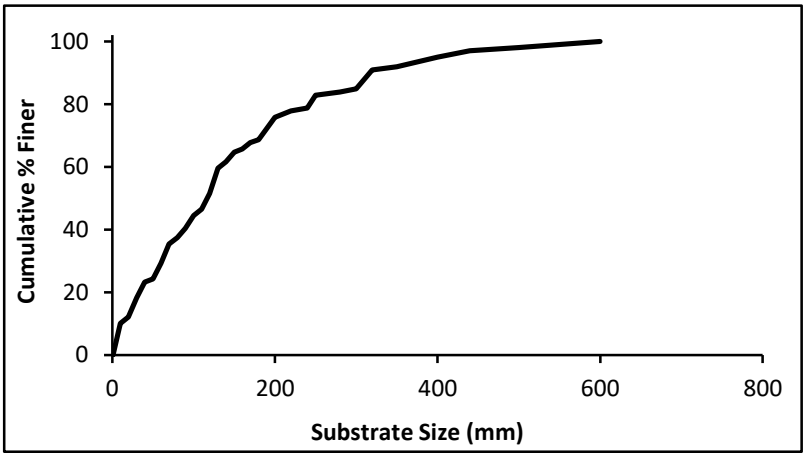
SGA ID:	R25.D
Length (ft):	4,360
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	72
RHA Percentage:	45%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	10
F. Gravel	2 - 16	2
C. Gravel	16 - 64	23
Cobble	64 - 256	48
Boulder	256 - 4096	17
Bedrock	> 4096	0

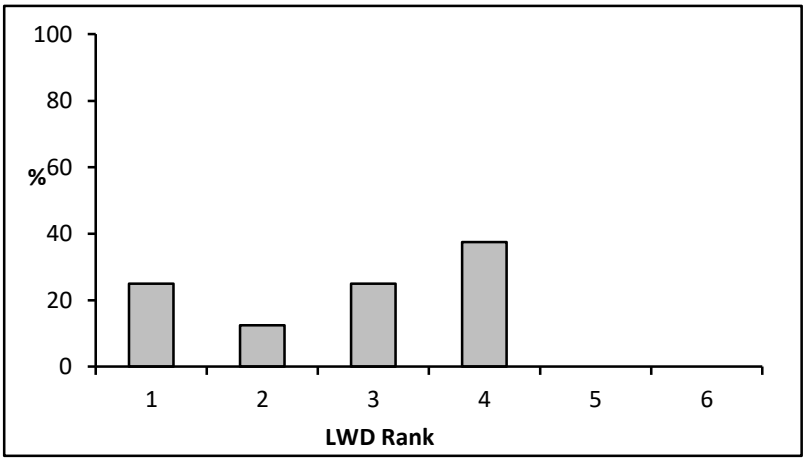
Median Substrate Size:	110	mm
Avg. Largest Particle (Bar):	120	mm
Riffle Stability Index (RSI):	52	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	2
2	0.5 ≤ D < 1.0	≥ 0.5	1
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	3
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

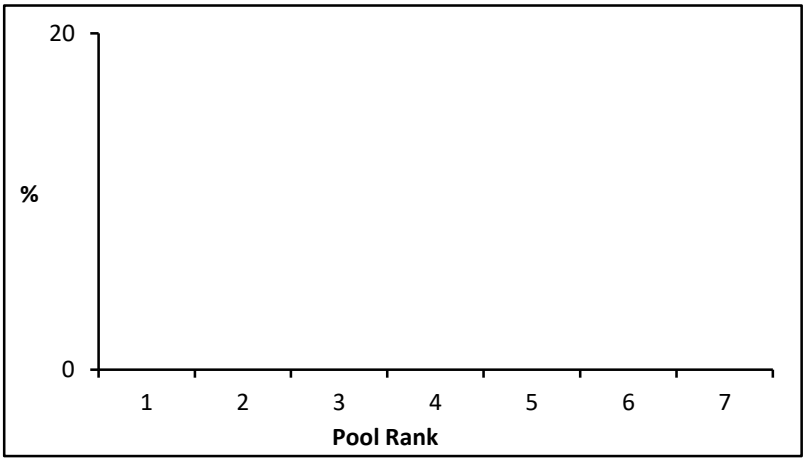
 # LWDs/mile: 10



Pools

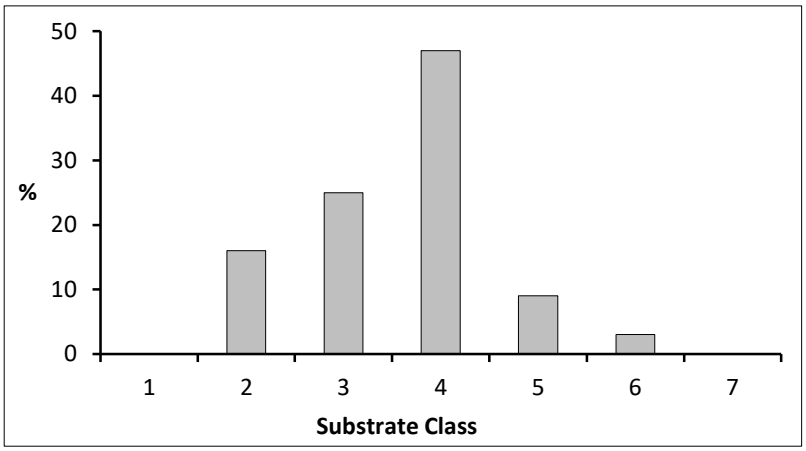
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



Reach/Segment Information

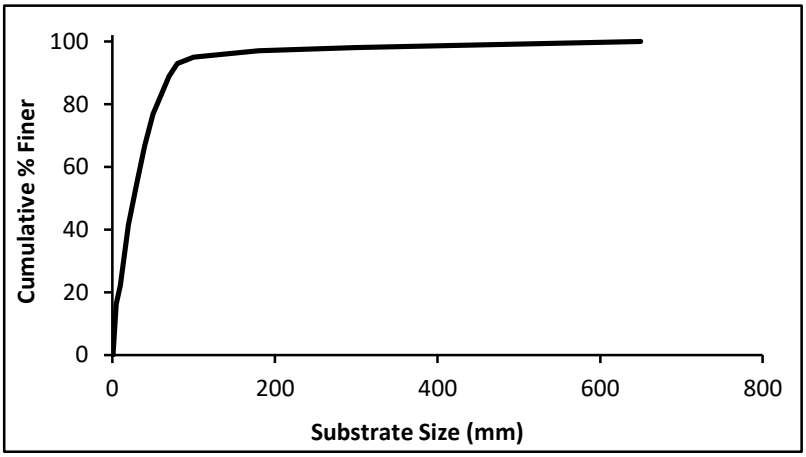
SGA ID:	R27
Length (ft):	2,698
Reference Bedform Type:	Riffle Pool
Total RHA Score:	45
RHA Percentage:	28%
Overall Habitat Condition:	Poor



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	16
F. Gravel	2 - 16	25
C. Gravel	16 - 64	47
Cobble	64 - 256	9
Boulder	256 - 4096	3
Bedrock	> 4096	0

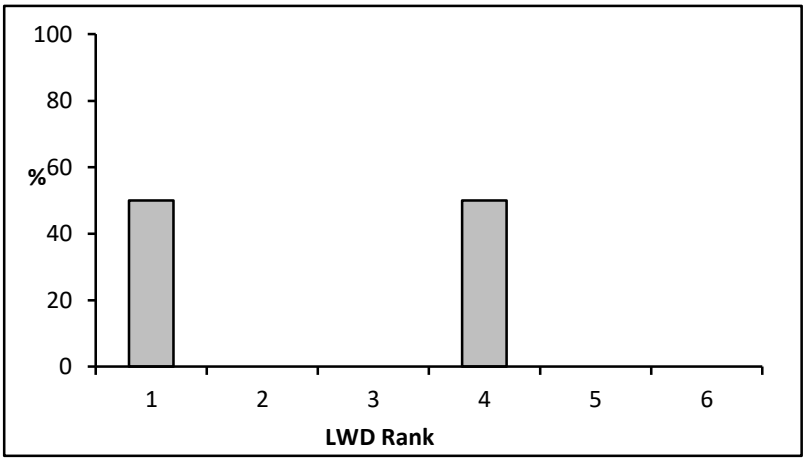
Median Substrate Size:	20	mm
Avg. Largest Particle (Bar):	20	mm
Riffle Stability Index (RSI):	41	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	1
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

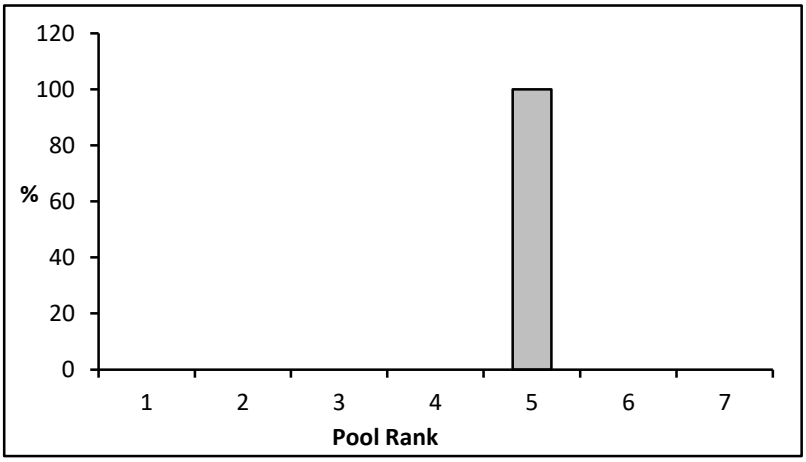
 # LWDs/mile: 4



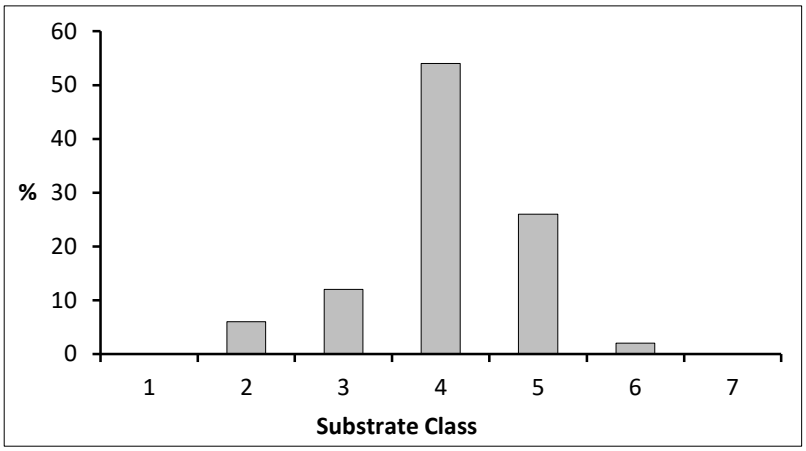
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	1
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 1.95701



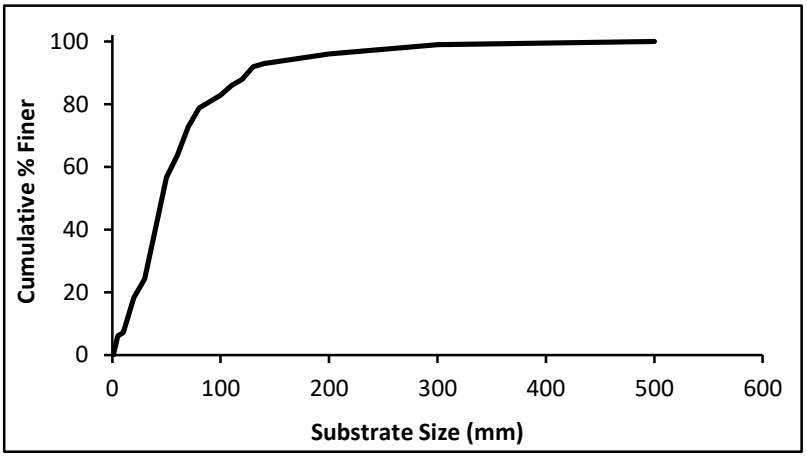
Reach/Segment Information	
SGA ID:	R28.A
Length (ft):	1,634
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	64
RHA Percentage:	40%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	6
F. Gravel	2 - 16	12
C. Gravel	16 - 64	54
Cobble	64 - 256	26
Boulder	256 - 4096	2
Bedrock	> 4096	0

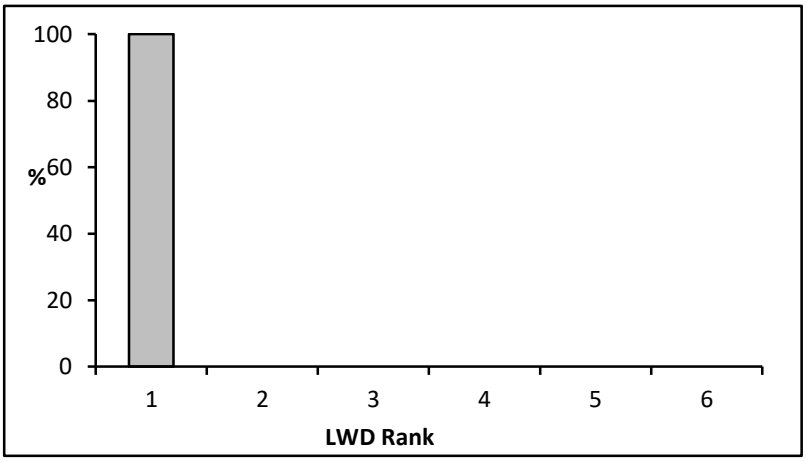
Median Substrate Size:	40	mm
Avg. Largest Particle (Bar):	40	mm
Riffle Stability Index (RSI):	1	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	3
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

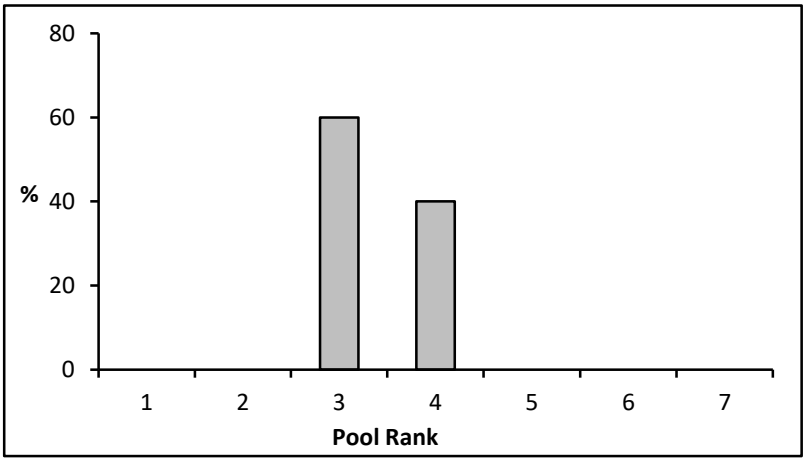
 # LWDs/mile: 10



Pools

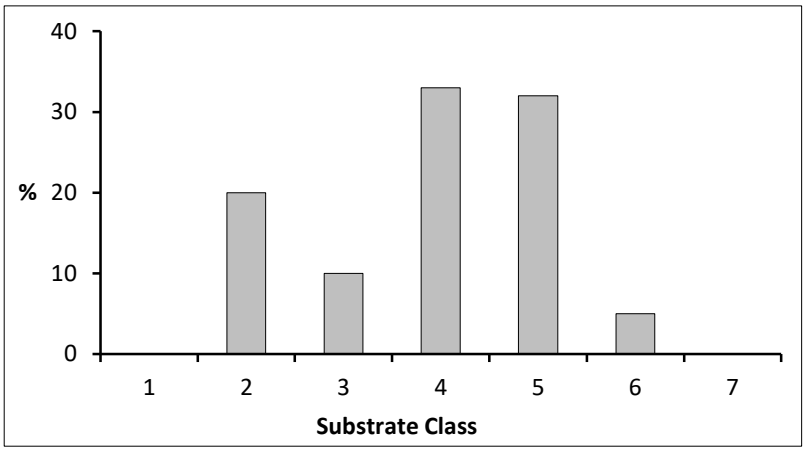
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	3
4	2.0 ≤ D < 3.0	≥ 0.5	2
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 16.1567



Reach/Segment Information

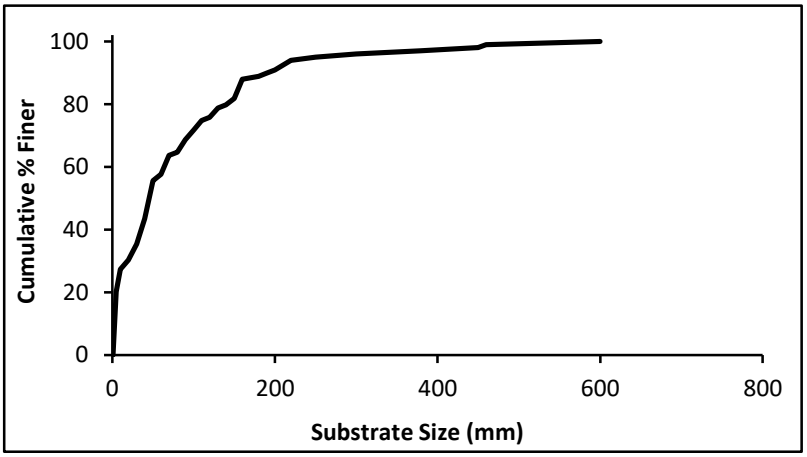
SGA ID:	R28.B
Length (ft):	7,337
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	77
RHA Percentage:	48%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	20
F. Gravel	2 - 16	10
C. Gravel	16 - 64	33
Cobble	64 - 256	32
Boulder	256 - 4096	5
Bedrock	> 4096	0

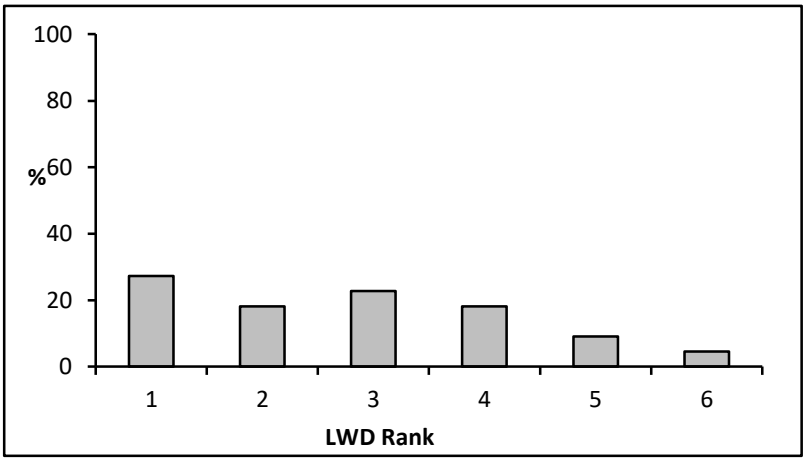
Median Substrate Size:	40	mm
Avg. Largest Particle (Bar):	50	mm
Riffle Stability Index (RSI):	45	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	6
2	0.5 ≤ D < 1.0	≥ 0.5	4
3	1.0 ≤ D < 2.0	< 0.5	5
4	1.0 ≤ D < 2.0	≥ 0.5	4
5	D ≥ 2.0	< 0.5	2
6	D ≥ 2.0	≥ 0.5	1

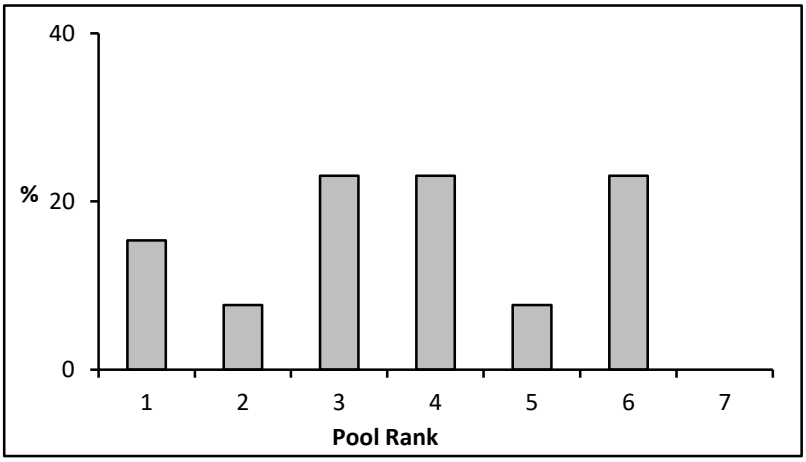
 # LWDs/mile: 16



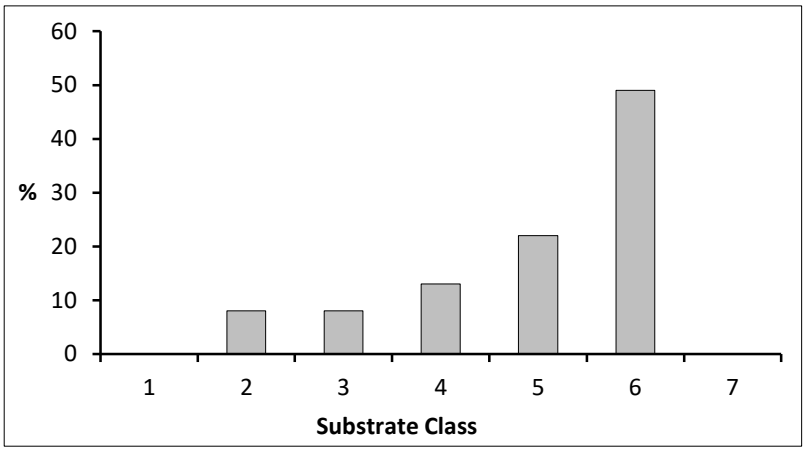
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	1
3	2.0 ≤ D < 3.0	< 0.5	3
4	2.0 ≤ D < 3.0	≥ 0.5	3
5	D ≥ 3.0	< 0.5	1
6	D ≥ 3.0	≥ 0.5	3
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 9.35532



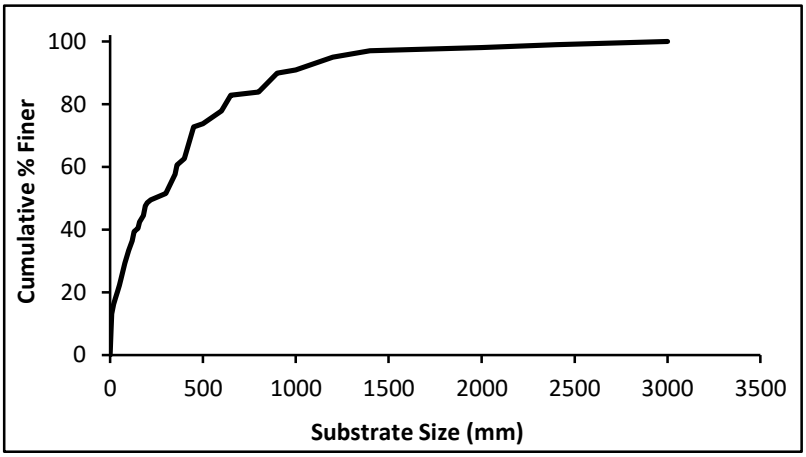
Reach/Segment Information	
SGA ID:	R29.A
Length (ft):	2,673
Reference Bedform Type:	Step-Pool
Total RHA Score:	96
RHA Percentage:	60%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	8
F. Gravel	2 - 16	8
C. Gravel	16 - 64	13
Cobble	64 - 256	22
Boulder	256 - 4096	49
Bedrock	> 4096	0

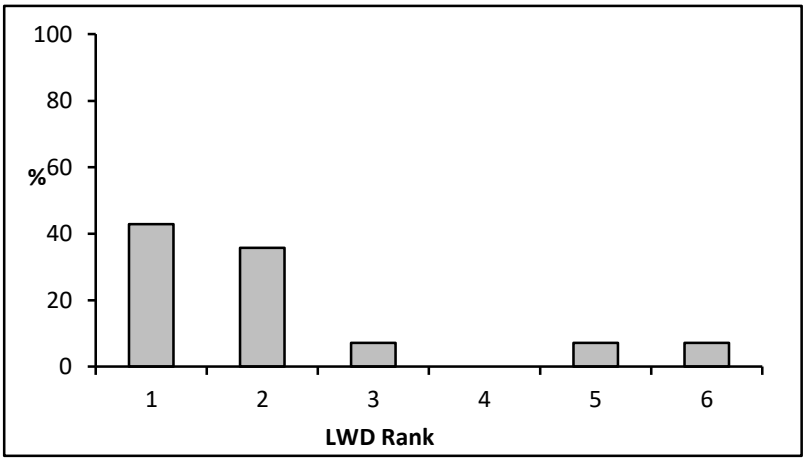
Median Substrate Size:	220	mm
Avg. Largest Particle (Bar):	200	mm
Riffle Stability Index (RSI):	47	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	6
2	0.5 ≤ D < 1.0	≥ 0.5	5
3	1.0 ≤ D < 2.0	< 0.5	1
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	1
6	D ≥ 2.0	≥ 0.5	1

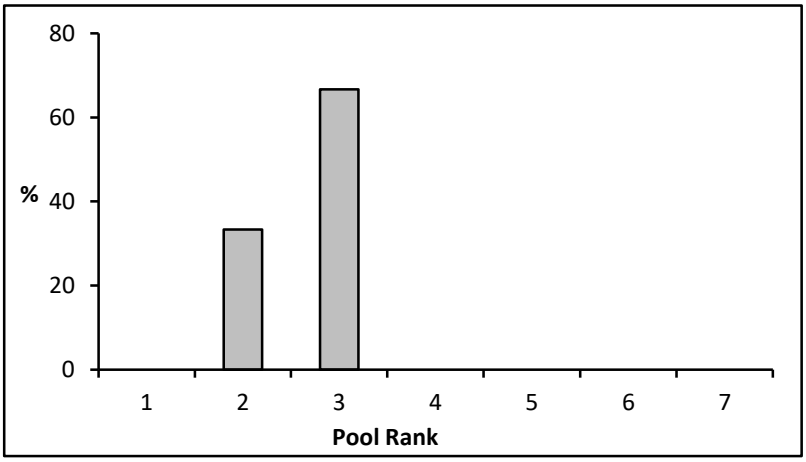
 # LWDs/mile: 28



Pools

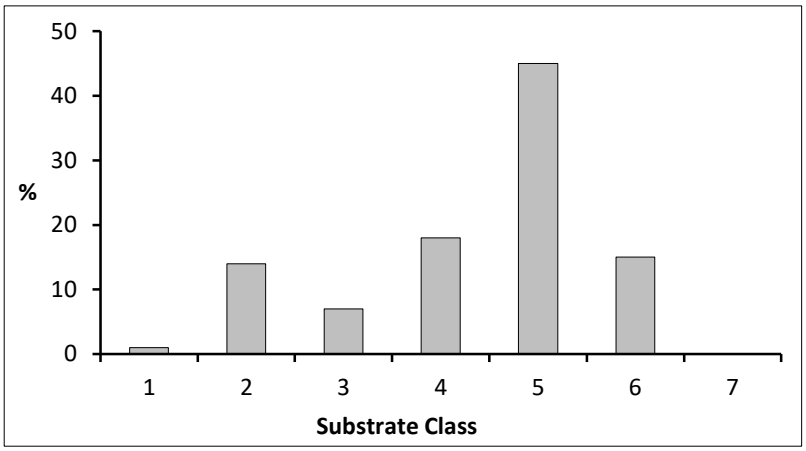
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	1
3	2.0 ≤ D < 3.0	< 0.5	2
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 5.92593



Reach/Segment Information

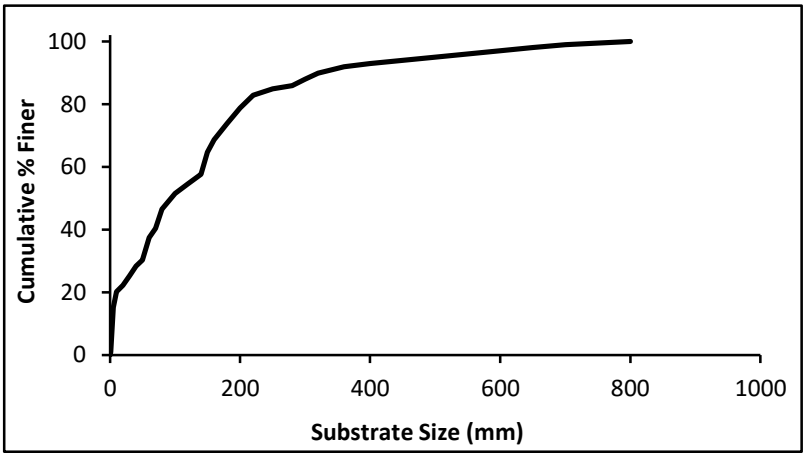
SGA ID:	R29.B
Length (ft):	946
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	70
RHA Percentage:	44%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	1
Sand	0.06 - 2	14
F. Gravel	2 - 16	7
C. Gravel	16 - 64	18
Cobble	64 - 256	45
Boulder	256 - 4096	15
Bedrock	> 4096	0

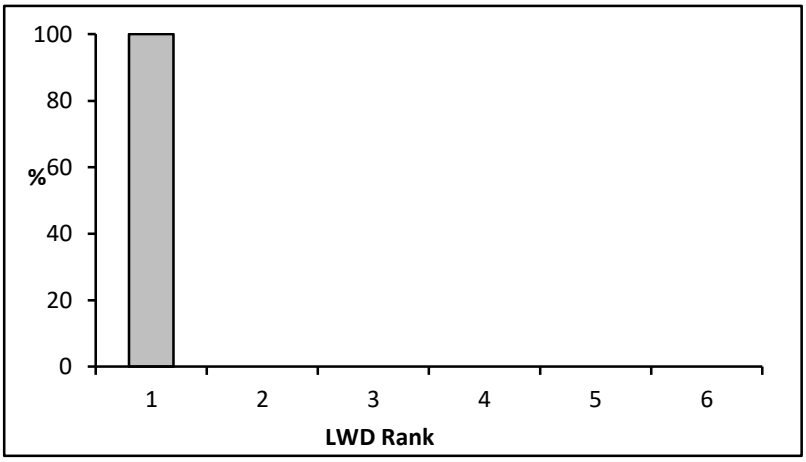
Median Substrate Size:	80	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	52	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

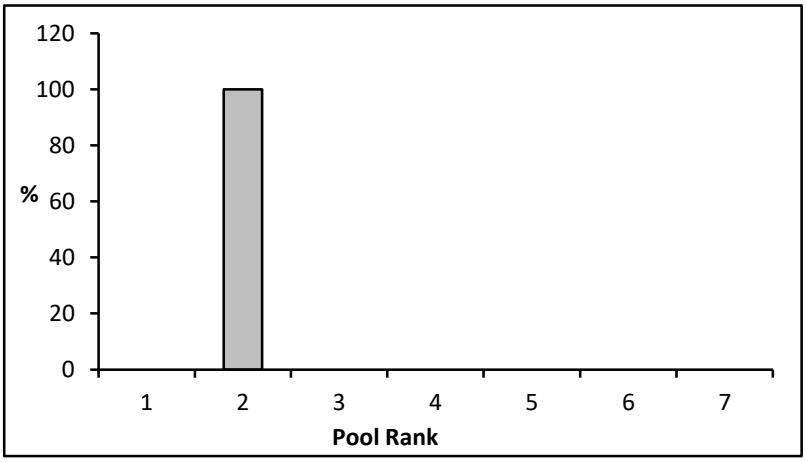
 # LWDs/mile: 6



Pools

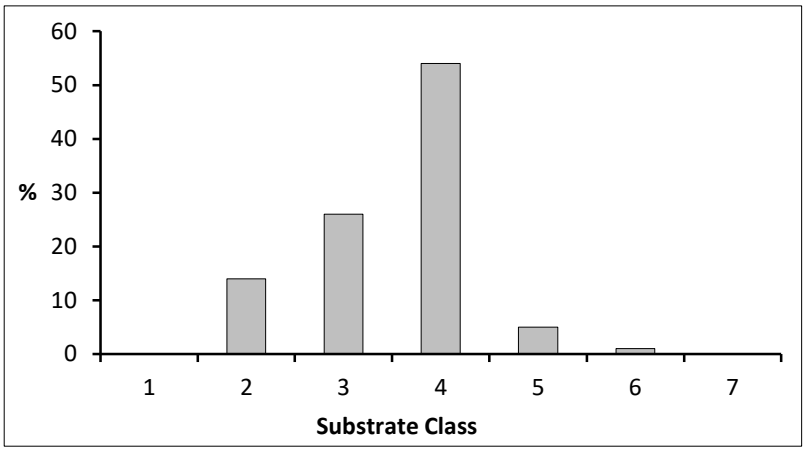
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	1
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 5.5814



Reach/Segment Information

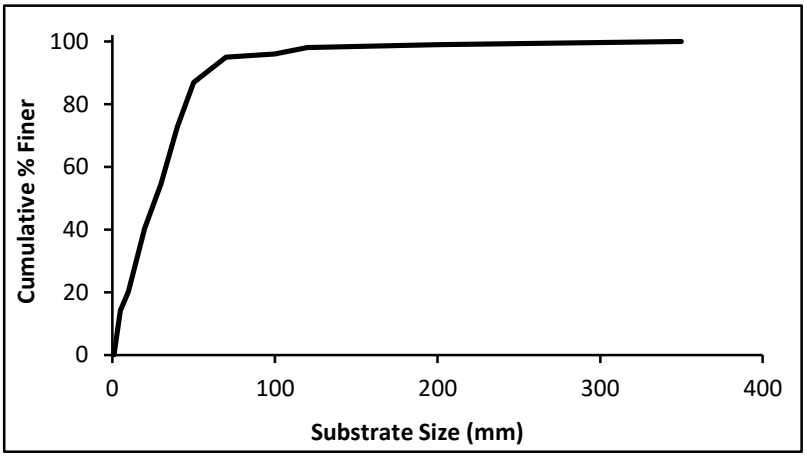
SGA ID:	R30.A
Length (ft):	2,273
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	77
RHA Percentage:	48%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	14
F. Gravel	2 - 16	26
C. Gravel	16 - 64	54
Cobble	64 - 256	5
Boulder	256 - 4096	1
Bedrock	> 4096	0

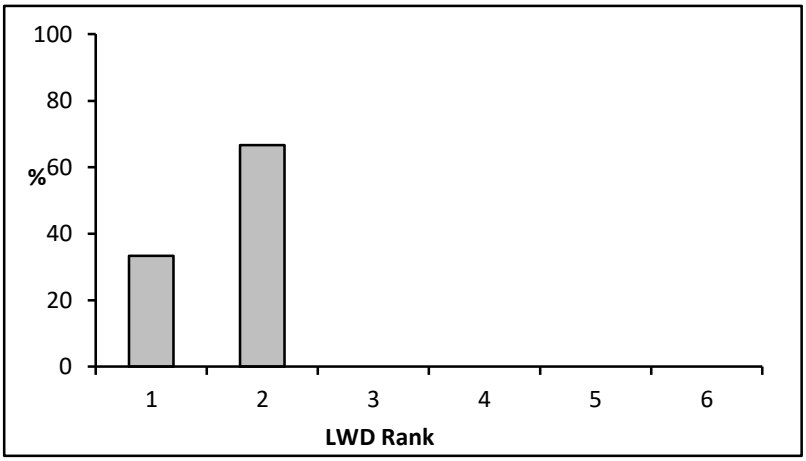
Median Substrate Size:	20	mm
Avg. Largest Particle (Bar):	60	mm
Riffle Stability Index (RSI):	91	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

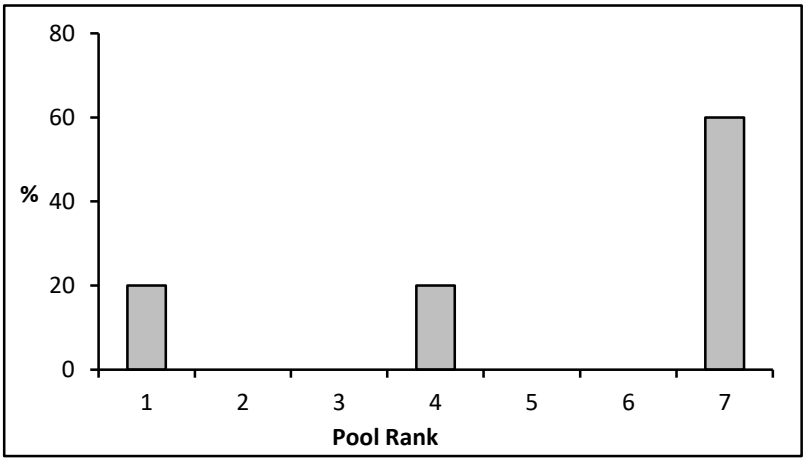
 # LWDs/mile: 7



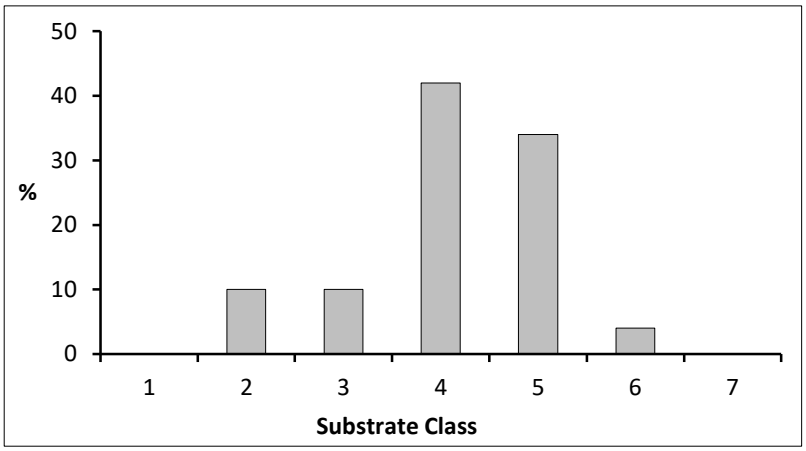
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	3

 # Pools/mile: 11.6146



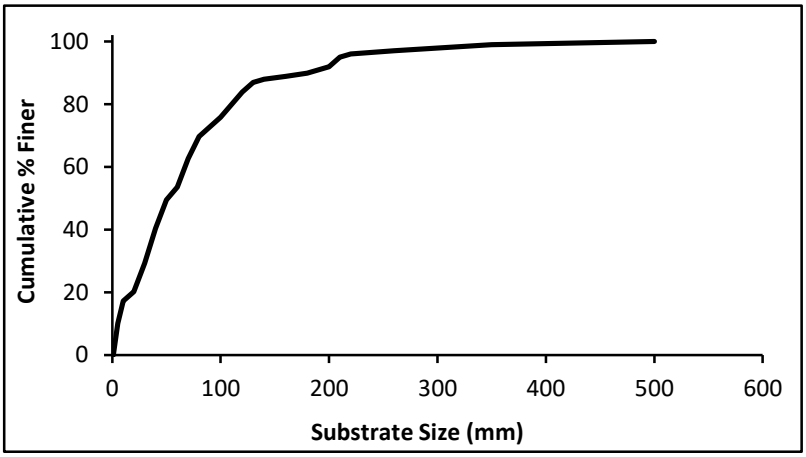
Reach/Segment Information	
SGA ID:	R30.C
Length (ft):	7,152
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	70
RHA Percentage:	44%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	10
F. Gravel	2 - 16	10
C. Gravel	16 - 64	42
Cobble	64 - 256	34
Boulder	256 - 4096	4
Bedrock	> 4096	0

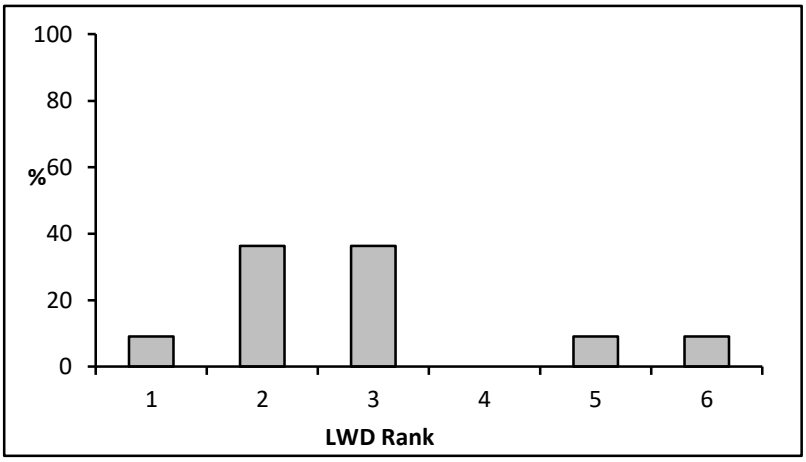
Median Substrate Size:	50	mm
Avg. Largest Particle (Bar):	90	mm
Riffle Stability Index (RSI):	73	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	4
3	1.0 ≤ D < 2.0	< 0.5	4
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	1
6	D ≥ 2.0	≥ 0.5	1

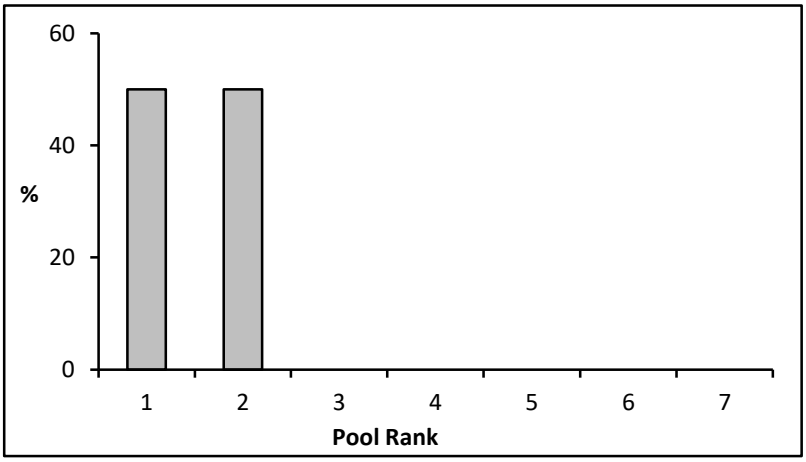
 # LWDs/mile: 8



Pools

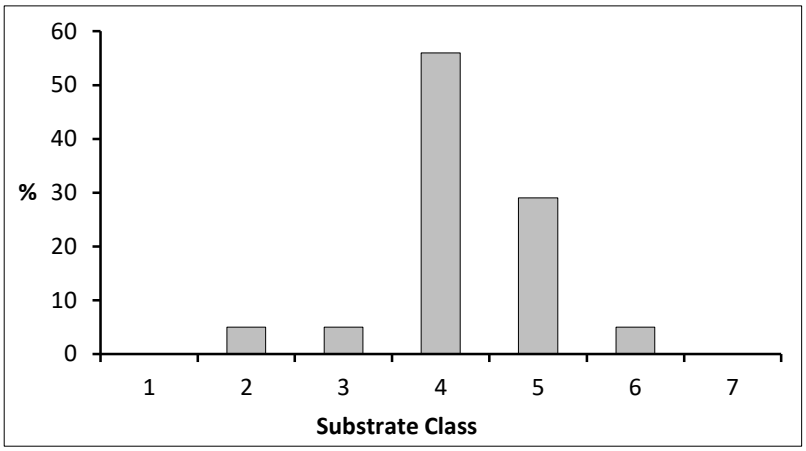
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	1
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 1.47651 ###



Reach/Segment Information

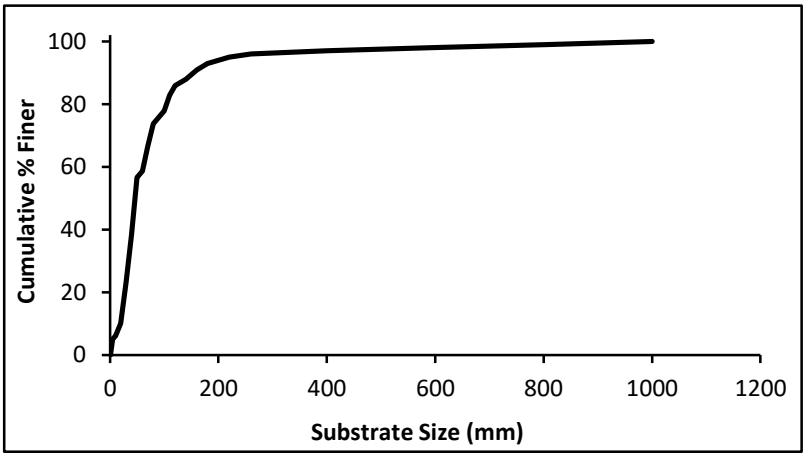
SGA ID:	T11.08A
Length (ft):	4,274
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	92
RHA Percentage:	58%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	5
F. Gravel	2 - 16	5
C. Gravel	16 - 64	56
Cobble	64 - 256	29
Boulder	256 - 4096	5
Bedrock	> 4096	0

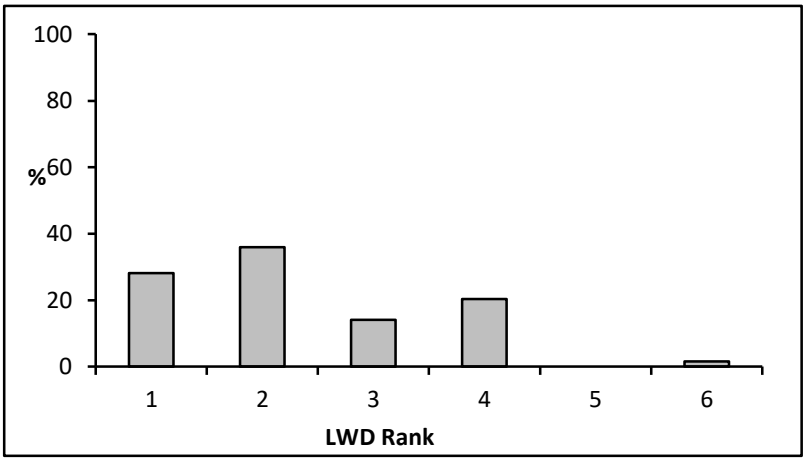
Median Substrate Size:	40	mm
Avg. Largest Particle (Bar):	130	mm
Riffle Stability Index (RSI):	87	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	18
2	0.5 ≤ D < 1.0	≥ 0.5	23
3	1.0 ≤ D < 2.0	< 0.5	9
4	1.0 ≤ D < 2.0	≥ 0.5	13
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	1

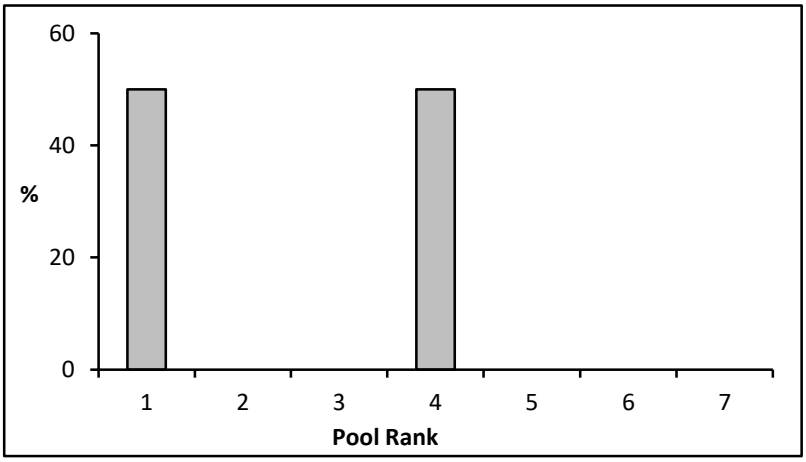
 # LWDs/mile: 79



Pools

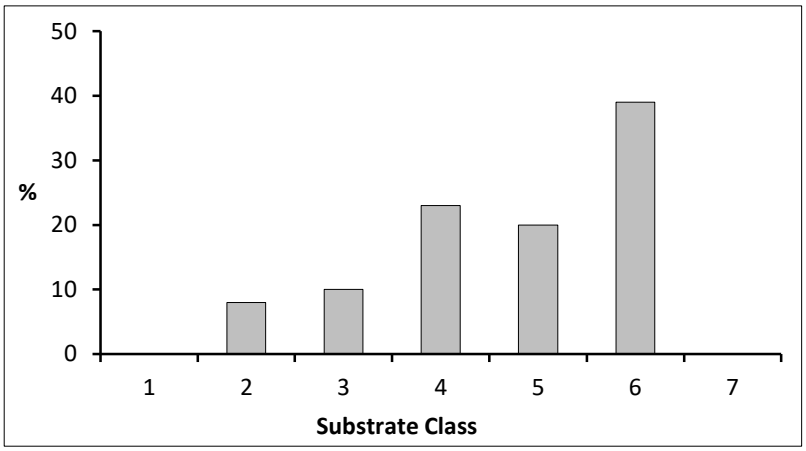
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	1
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 2.47075



Reach/Segment Information

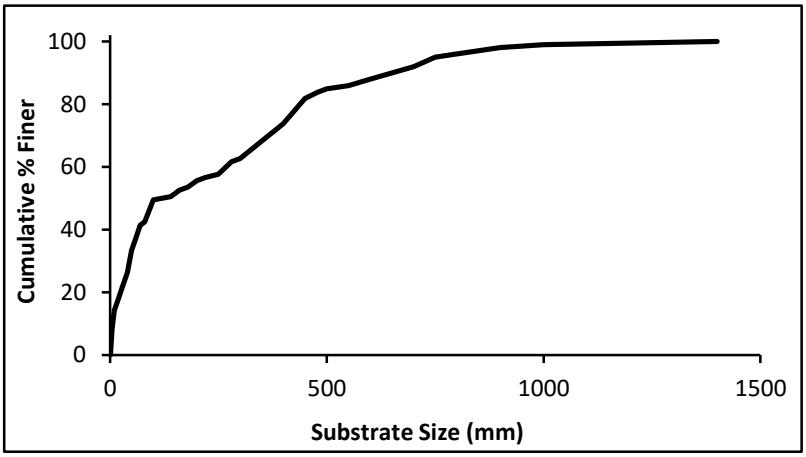
SGA ID:	T11.08B
Length (ft):	2,678
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	78
RHA Percentage:	49%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	8
F. Gravel	2 - 16	10
C. Gravel	16 - 64	23
Cobble	64 - 256	20
Boulder	256 - 4096	39
Bedrock	> 4096	0

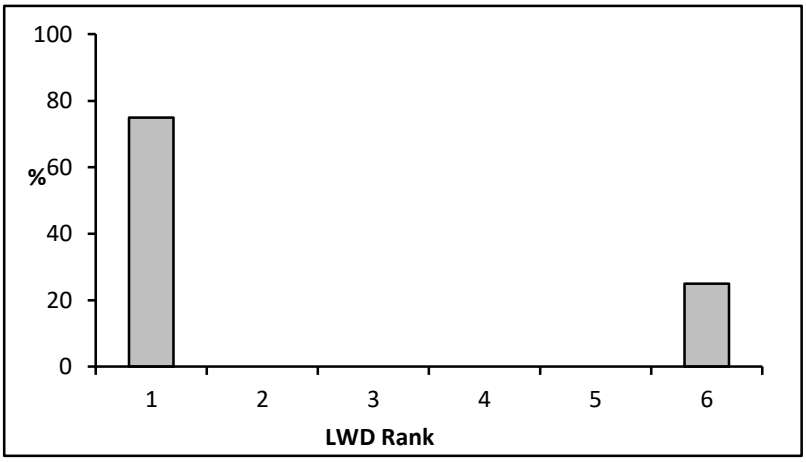
Median Substrate Size:	120	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	49	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	3
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	1

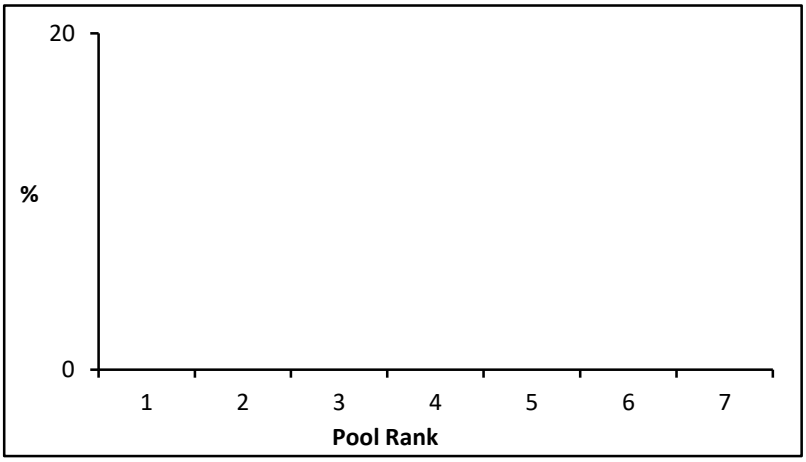
 # LWDs/mile: 8



Pools

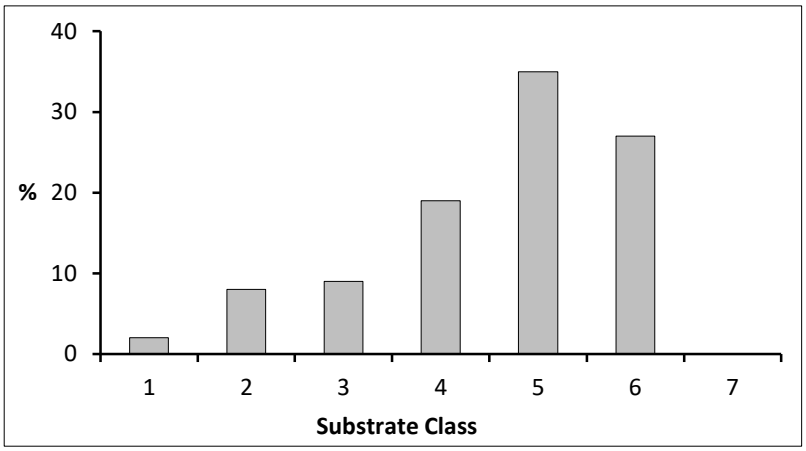
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



Reach/Segment Information

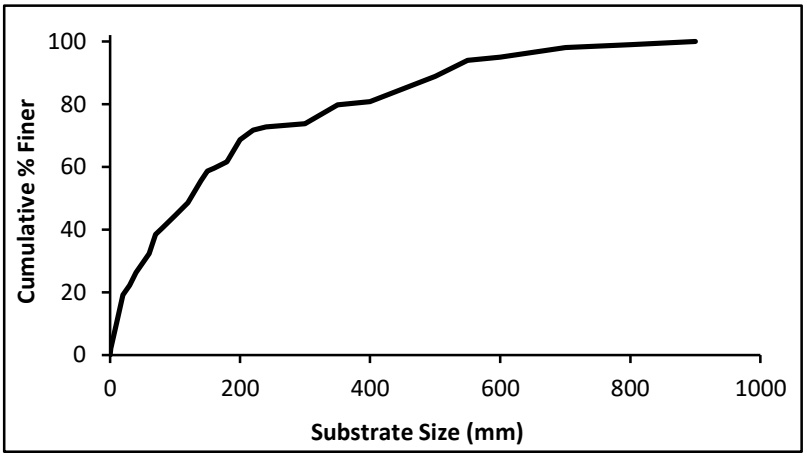
SGA ID:	T12.01
Length (ft):	977
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	101
RHA Percentage:	63%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	2
Sand	0.06 - 2	8
F. Gravel	2 - 16	9
C. Gravel	16 - 64	19
Cobble	64 - 256	35
Boulder	256 - 4096	27
Bedrock	> 4096	0

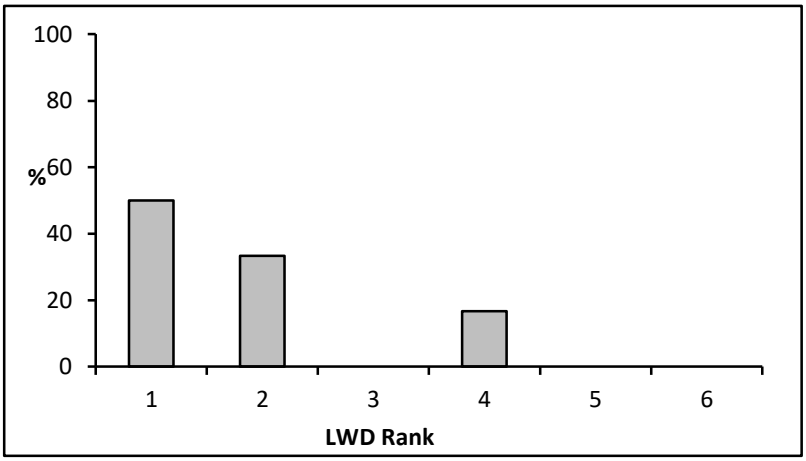
Median Substrate Size:	120	mm
Avg. Largest Particle (Bar):	200	mm
Riffle Stability Index (RSI):	69	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	3
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	1
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

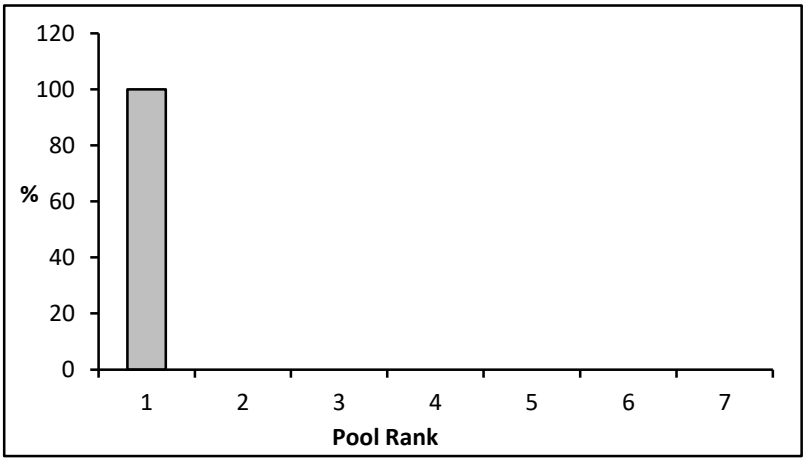
 # LWDs/mile: 32



Pools

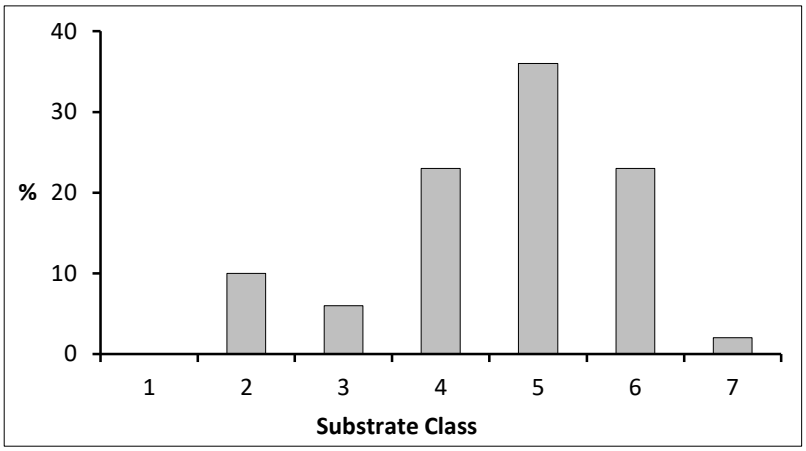
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 10.8086



Reach/Segment Information

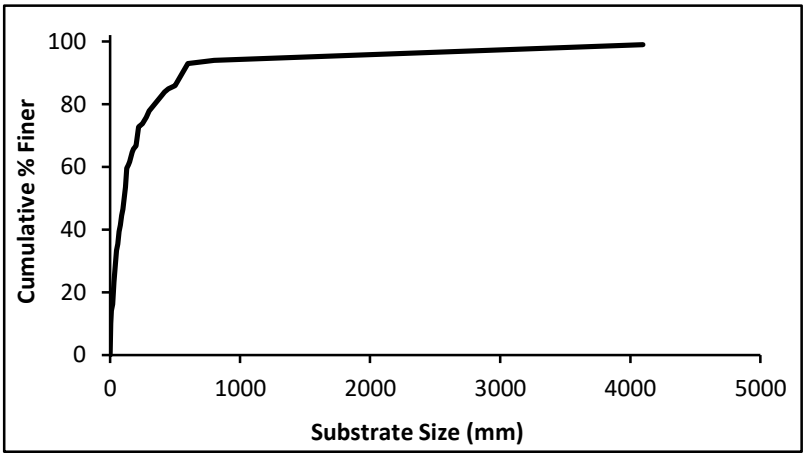
SGA ID:	T12.02
Length (ft):	1,273
Reference Bedform Type:	Step Pool
Total RHA Score:	85
RHA Percentage:	53%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	10
F. Gravel	2 - 16	6
C. Gravel	16 - 64	23
Cobble	64 - 256	36
Boulder	256 - 4096	23
Bedrock	> 4096	2

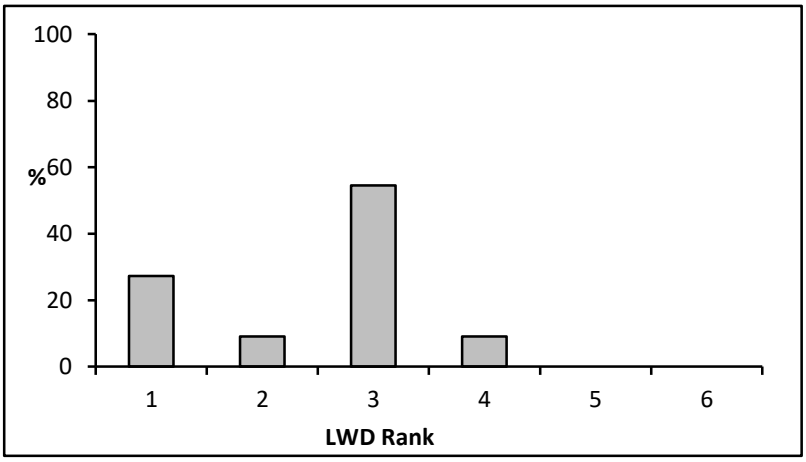
Median Substrate Size:	100	mm
Avg. Largest Particle (Bar):	110	mm
Riffle Stability Index (RSI):	50	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	3
2	0.5 ≤ D < 1.0	≥ 0.5	1
3	1.0 ≤ D < 2.0	< 0.5	6
4	1.0 ≤ D < 2.0	≥ 0.5	1
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

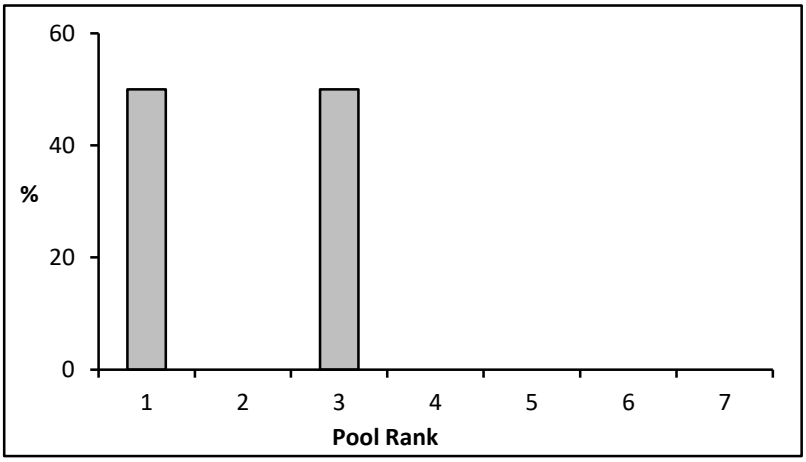
 # LWDs/mile: 46



Pools

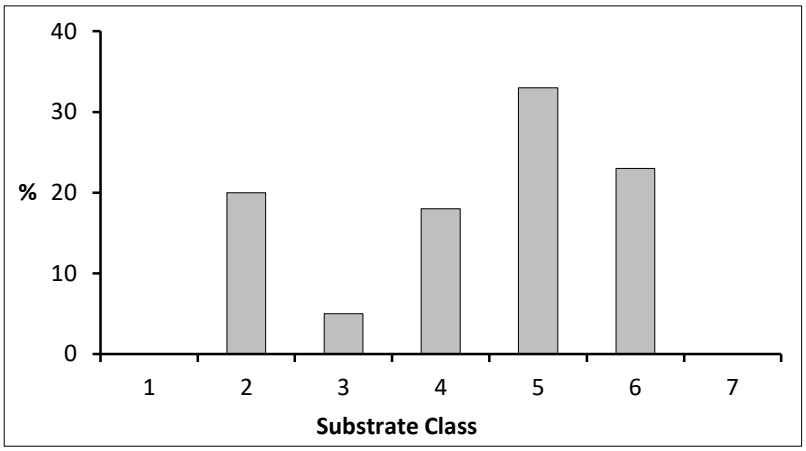
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	2
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 16.5907



Reach/Segment Information

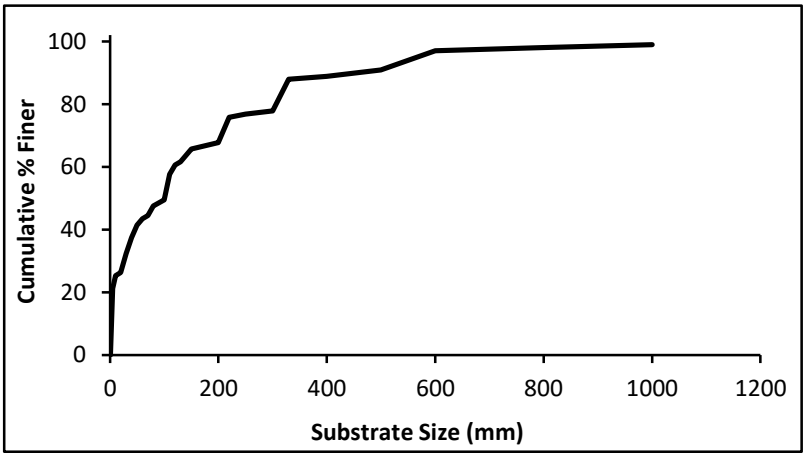
SGA ID:	T12.03
Length (ft):	5,958
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	86
RHA Percentage:	54%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	20
F. Gravel	2 - 16	5
C. Gravel	16 - 64	18
Cobble	64 - 256	33
Boulder	256 - 4096	23
Bedrock	> 4096	0

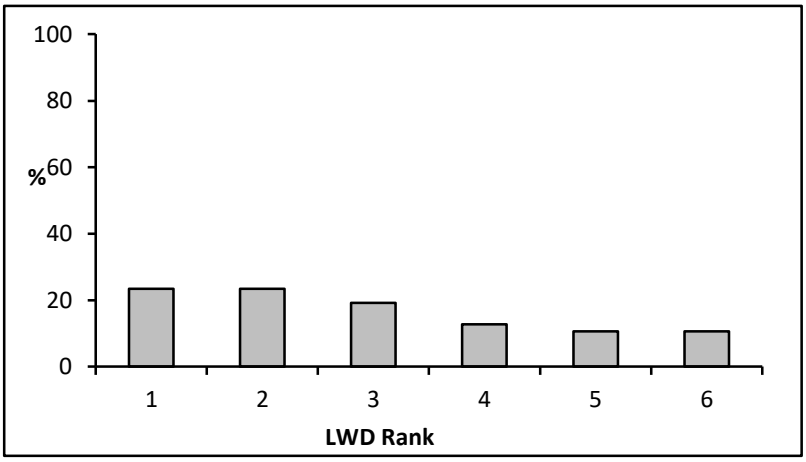
Median Substrate Size:	100	mm
Avg. Largest Particle (Bar):	80	mm
Riffle Stability Index (RSI):	47	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	11
2	0.5 ≤ D < 1.0	≥ 0.5	11
3	1.0 ≤ D < 2.0	< 0.5	9
4	1.0 ≤ D < 2.0	≥ 0.5	6
5	D ≥ 2.0	< 0.5	5
6	D ≥ 2.0	≥ 0.5	5

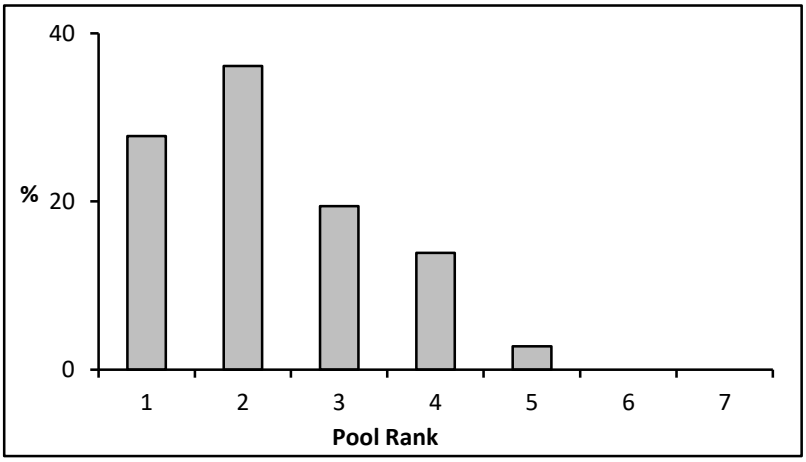
 # LWDs/mile: 42



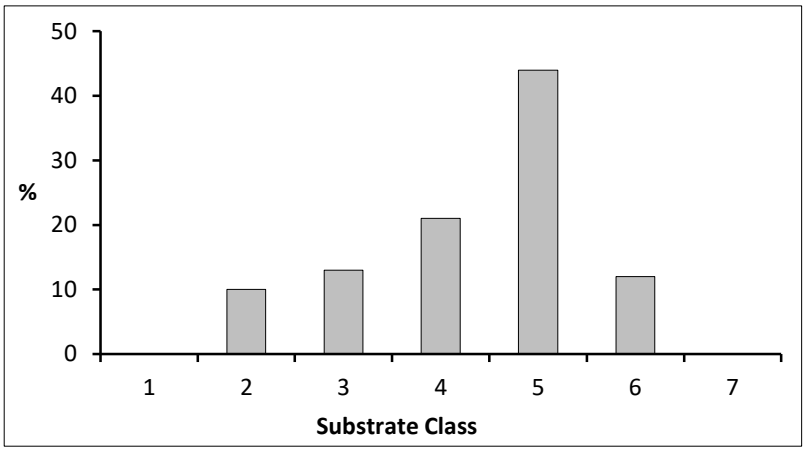
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	10
2	1.0 ≤ D < 2.0	≥ 0.5	13
3	2.0 ≤ D < 3.0	< 0.5	7
4	2.0 ≤ D < 3.0	≥ 0.5	5
5	D ≥ 3.0	< 0.5	1
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 31.9033



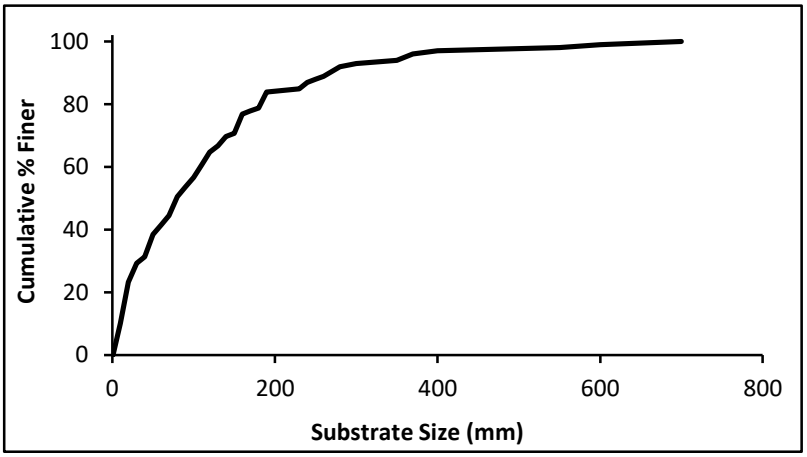
Reach/Segment Information	
SGA ID:	T12.04
Length (ft):	5,106
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	78
RHA Percentage:	49%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	10
F. Gravel	2 - 16	13
C. Gravel	16 - 64	21
Cobble	64 - 256	44
Boulder	256 - 4096	12
Bedrock	> 4096	0

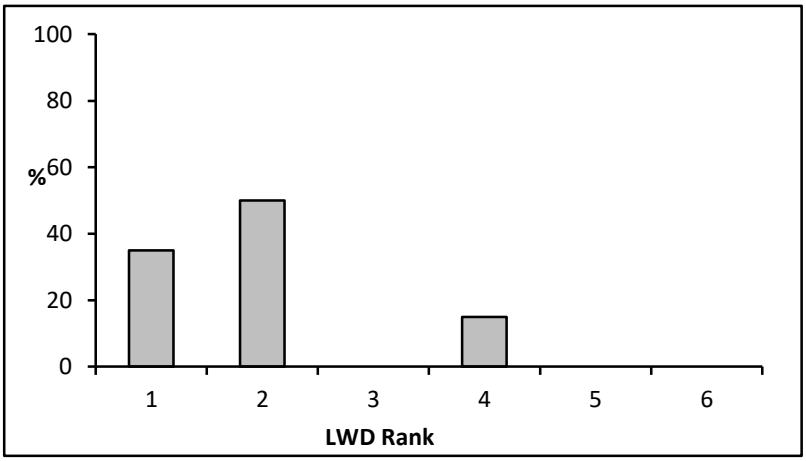
Median Substrate Size:	75	mm
Avg. Largest Particle (Bar):	120	mm
Riffle Stability Index (RSI):	65	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	14
2	0.5 ≤ D < 1.0	≥ 0.5	20
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	6
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

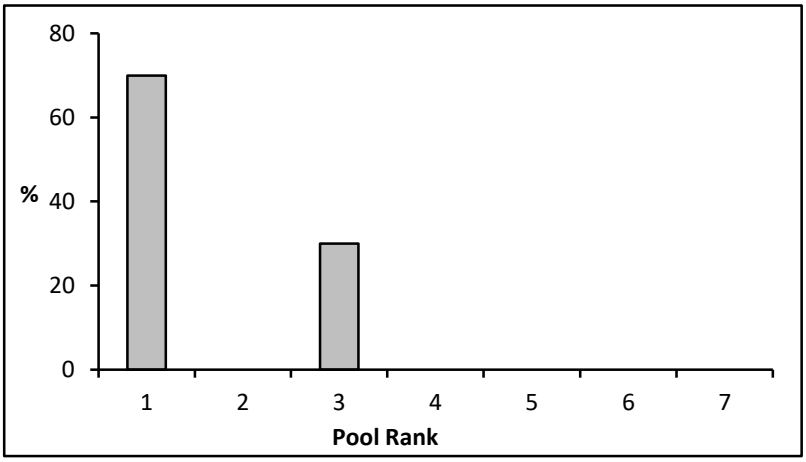
 # LWDs/mile: 41



Pools

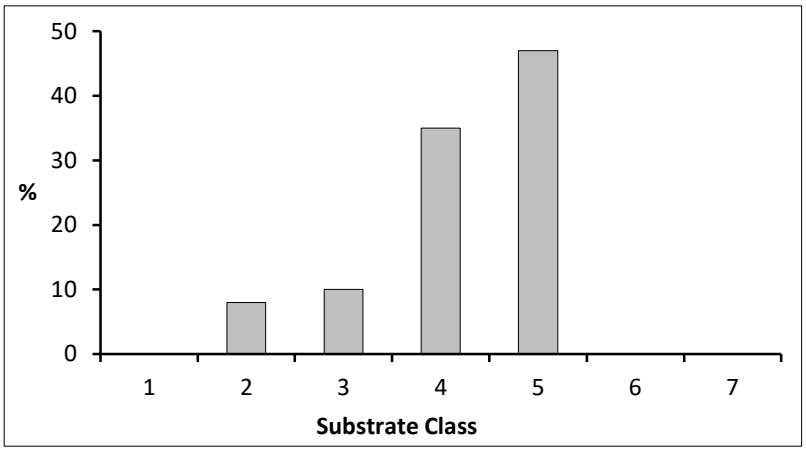
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	7
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	3
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 10.3408



Reach/Segment Information

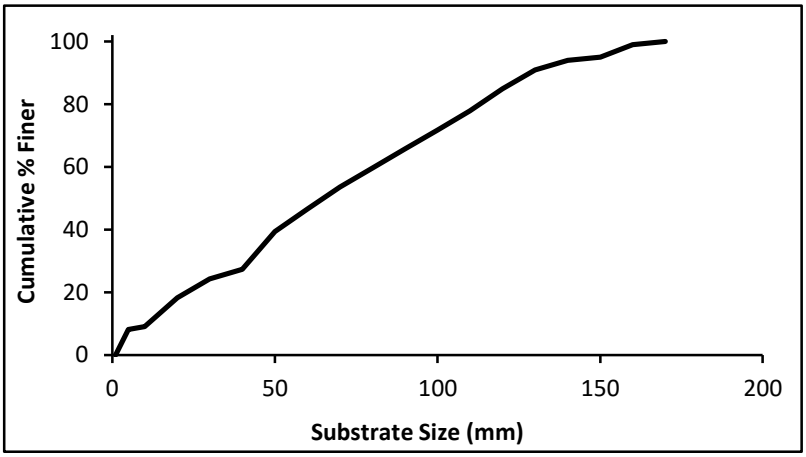
SGA ID:	T13.04
Length (ft):	2,951
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	111
RHA Percentage:	69%
Overall Habitat Condition:	Good



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	8
F. Gravel	2 - 16	10
C. Gravel	16 - 64	35
Cobble	64 - 256	47
Boulder	256 - 4096	0
Bedrock	> 4096	0

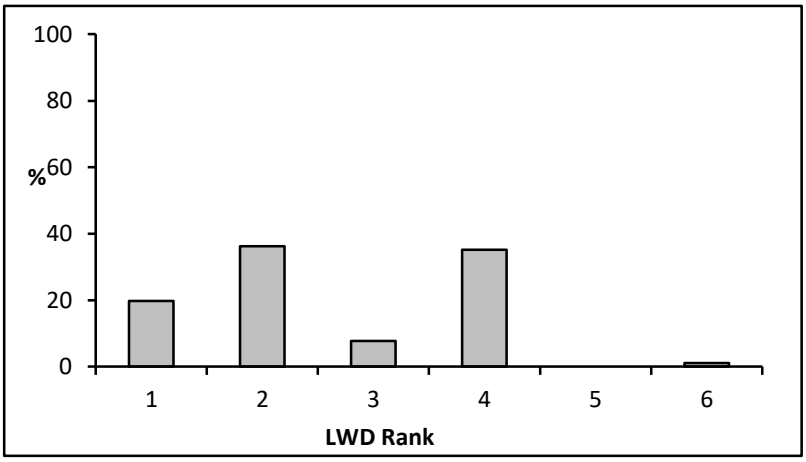
Median Substrate Size:	60	mm
Avg. Largest Particle (Bar):	130	mm
Riffle Stability Index (RSI):	91	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	18
2	0.5 ≤ D < 1.0	≥ 0.5	33
3	1.0 ≤ D < 2.0	< 0.5	7
4	1.0 ≤ D < 2.0	≥ 0.5	32
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	1

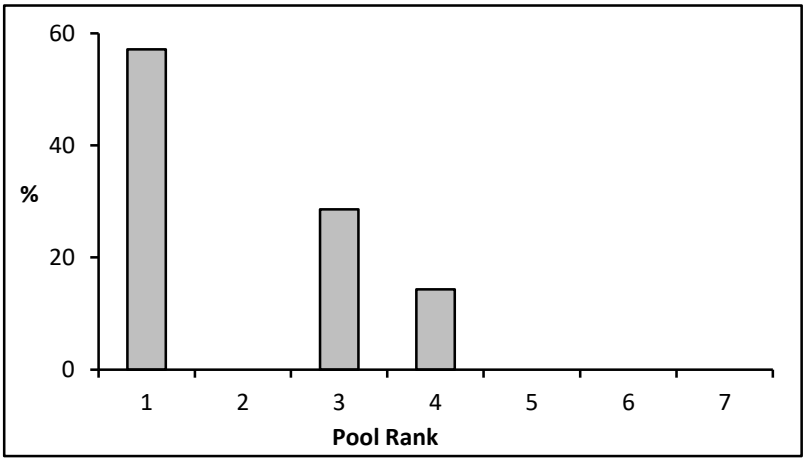
 # LWDs/mile: 163



Pools

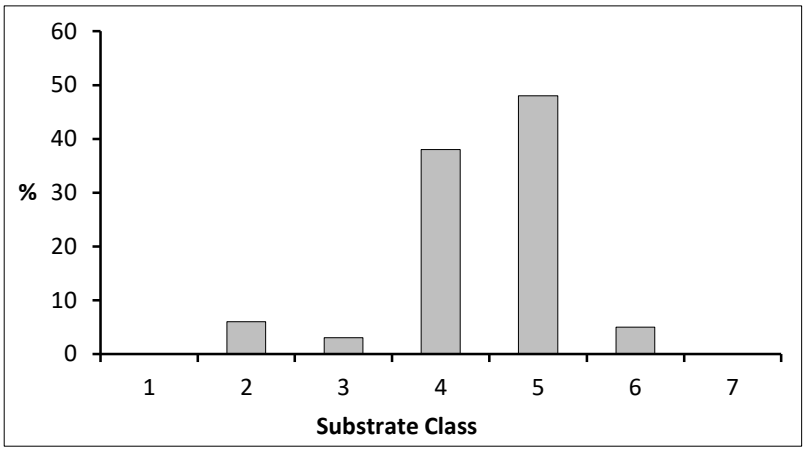
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	4
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	2
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 12.5246



Reach/Segment Information

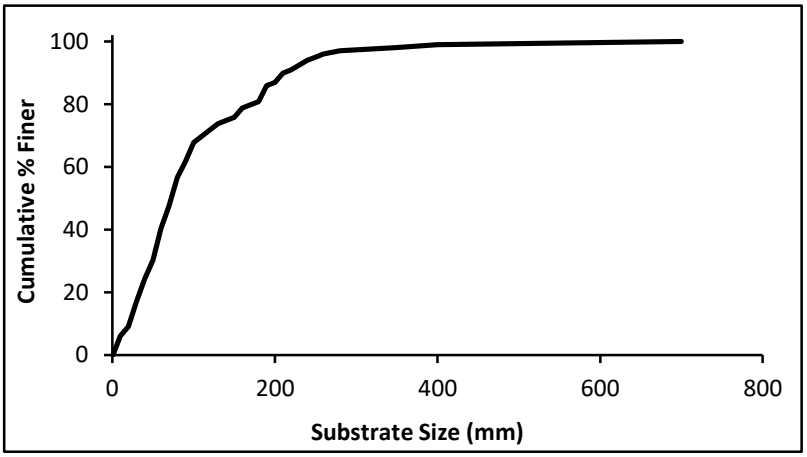
SGA ID:	T13.S2.01.A
Length (ft):	5,301
Reference Bedform Type:	Step-Pool
Total RHA Score:	102
RHA Percentage:	64%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	6
F. Gravel	2 - 16	3
C. Gravel	16 - 64	38
Cobble	64 - 256	48
Boulder	256 - 4096	5
Bedrock	> 4096	0

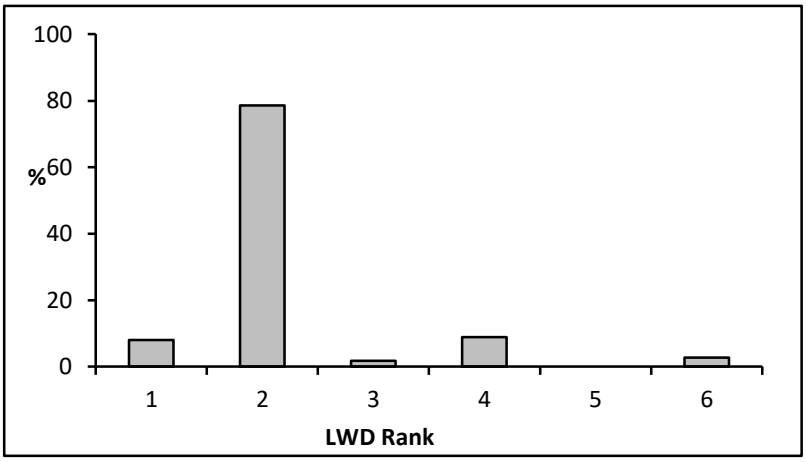
Median Substrate Size:	70	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	68	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	9
2	0.5 ≤ D < 1.0	≥ 0.5	88
3	1.0 ≤ D < 2.0	< 0.5	2
4	1.0 ≤ D < 2.0	≥ 0.5	10
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	3

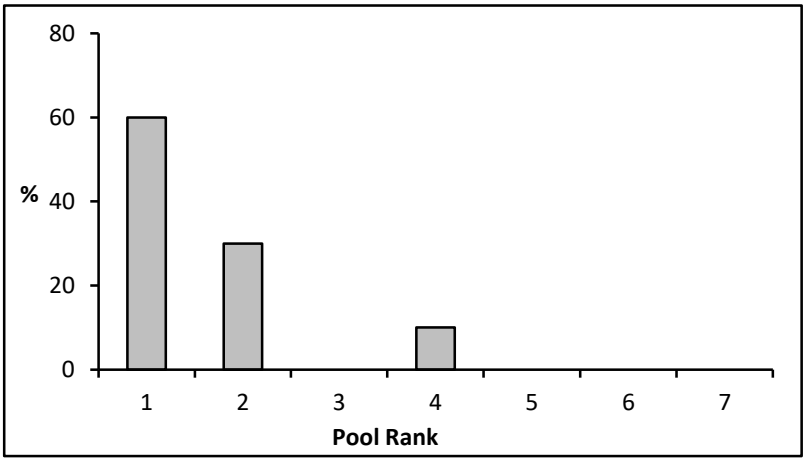
 # LWDs/mile: 112



Pools

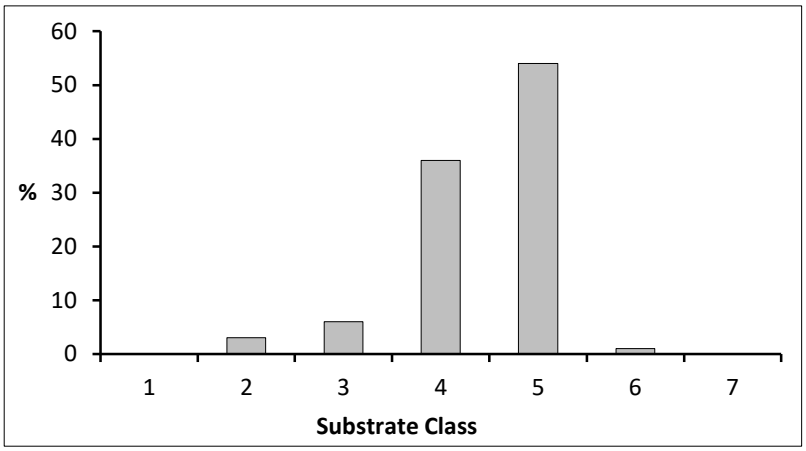
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	6
2	1.0 ≤ D < 2.0	≥ 0.5	3
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	1
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 9.96038



Reach/Segment Information

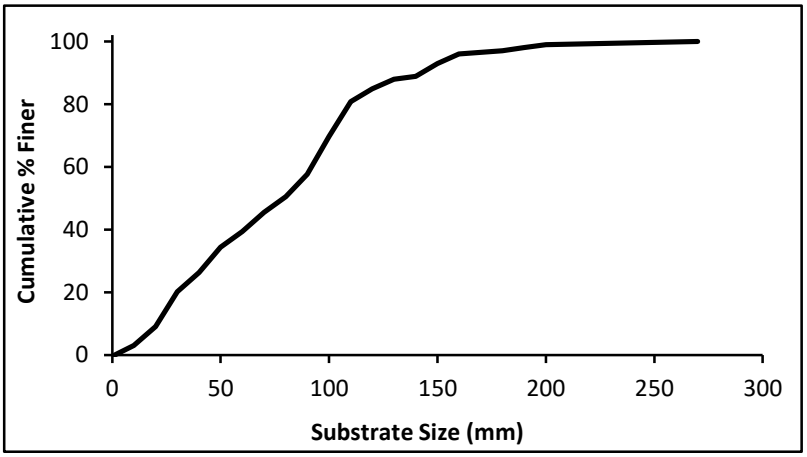
SGA ID:	T13.S2.01.B
Length (ft):	1,910
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	65
RHA Percentage:	41%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	3
F. Gravel	2 - 16	6
C. Gravel	16 - 64	36
Cobble	64 - 256	54
Boulder	256 - 4096	1
Bedrock	> 4096	0

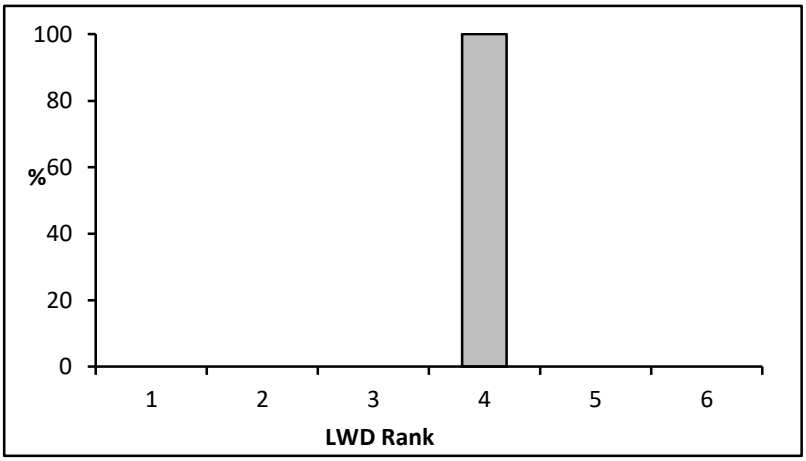
Median Substrate Size:	75	mm
Avg. Largest Particle (Bar):	90	mm
Riffle Stability Index (RSI):	58	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	0
2	0.5 ≤ D < 1.0	≥ 0.5	0
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	1
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

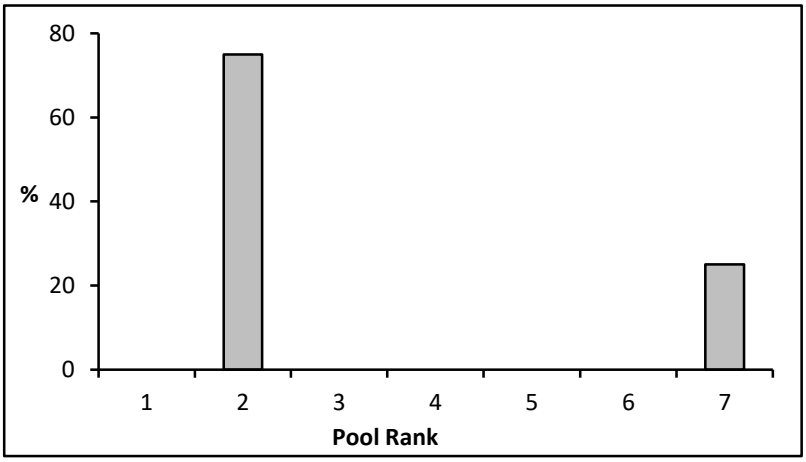
 # LWDs/mile: 3



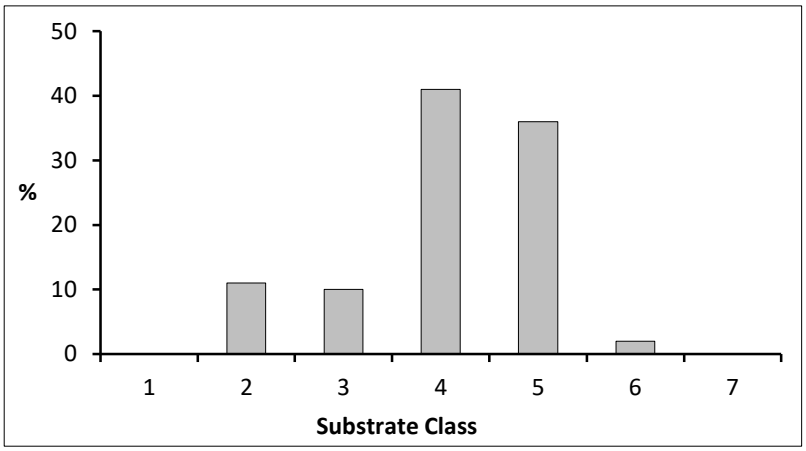
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	3
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	1

 # Pools/mile: 11.0576



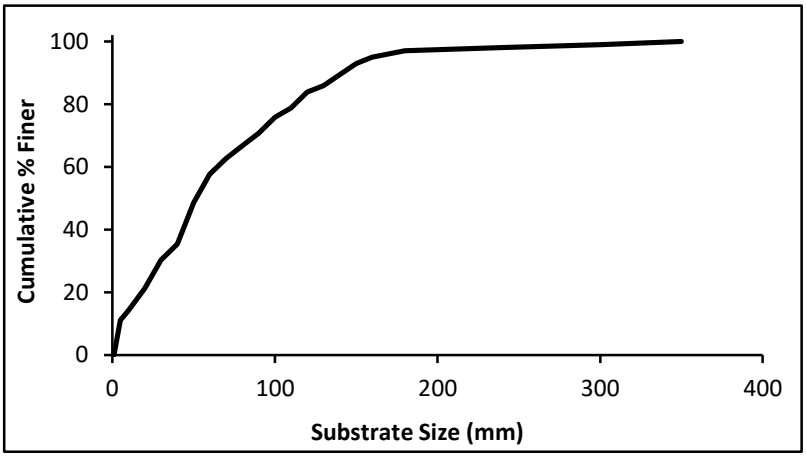
Reach/Segment Information	
SGA ID:	T13.S2.01.C
Length (ft):	1,866
Reference Bedform Type:	Step-Pool
Total RHA Score:	90
RHA Percentage:	56%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	11
F. Gravel	2 - 16	10
C. Gravel	16 - 64	41
Cobble	64 - 256	36
Boulder	256 - 4096	2
Bedrock	> 4096	0

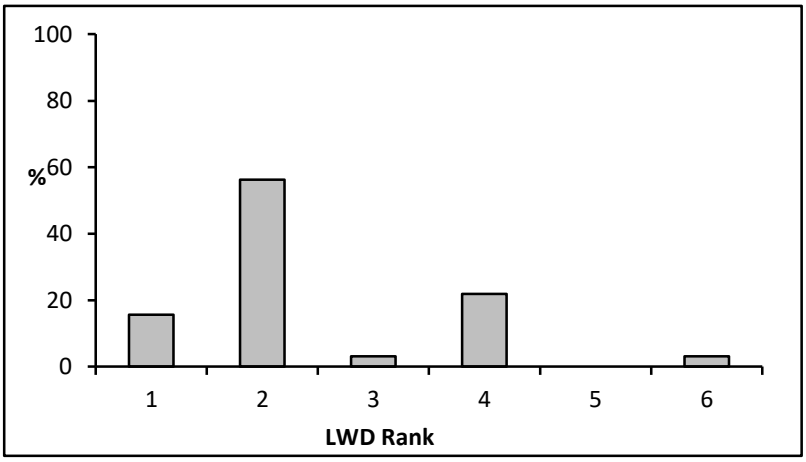
Median Substrate Size:	50	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	76	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	5
2	0.5 ≤ D < 1.0	≥ 0.5	18
3	1.0 ≤ D < 2.0	< 0.5	1
4	1.0 ≤ D < 2.0	≥ 0.5	7
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	1

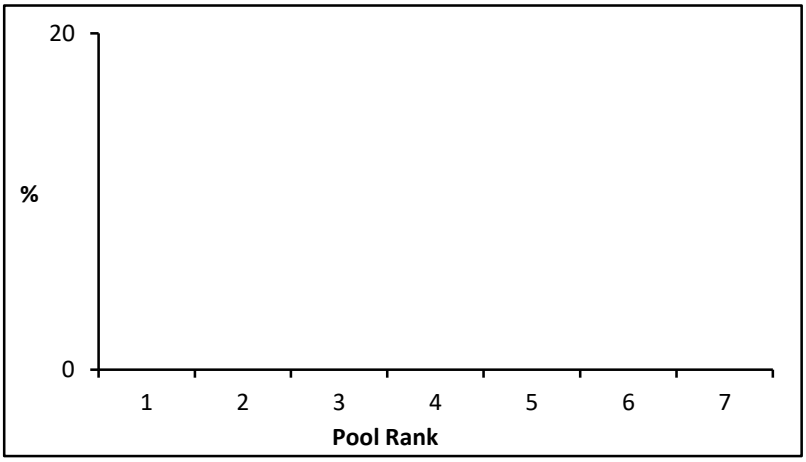
 # LWDs/mile: 91



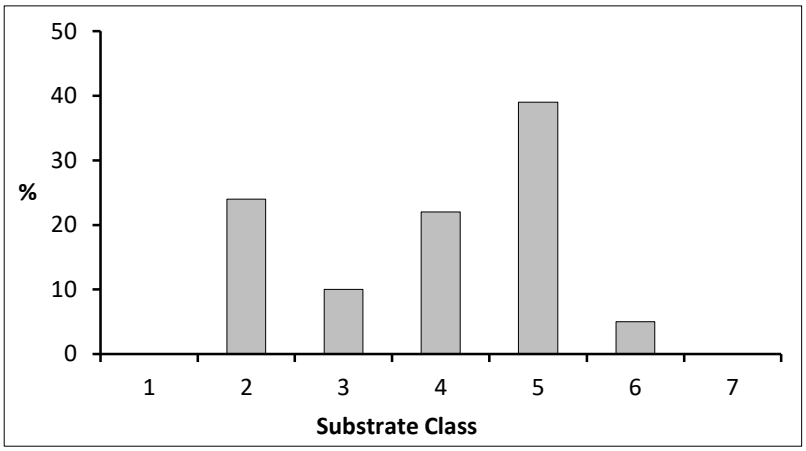
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 0



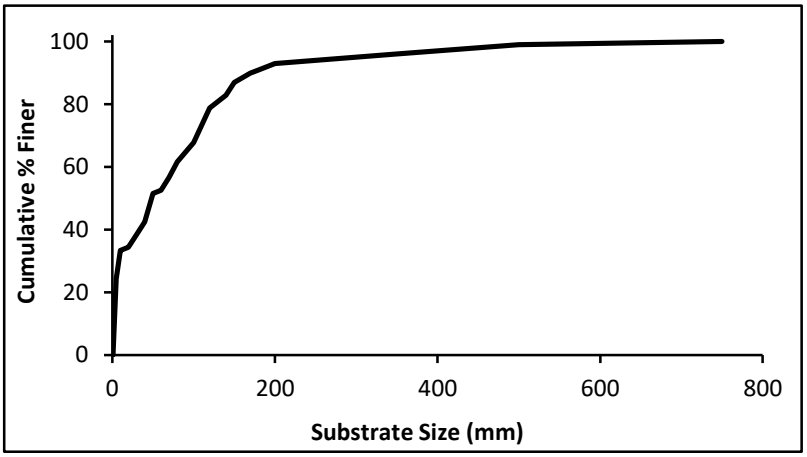
Reach/Segment Information	
SGA ID:	T14.01A
Length (ft):	4,669
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	83
RHA Percentage:	52%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	24
F. Gravel	2 - 16	10
C. Gravel	16 - 64	22
Cobble	64 - 256	39
Boulder	256 - 4096	5
Bedrock	> 4096	0

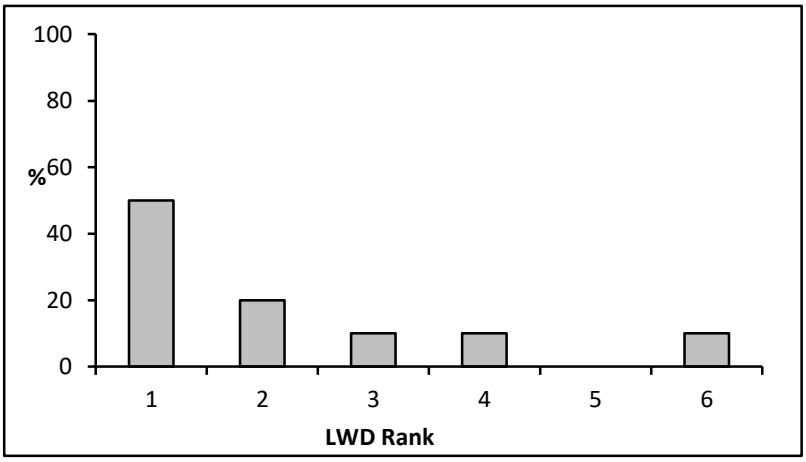
Median Substrate Size:	40	mm
Avg. Largest Particle (Bar):	100	mm
Riffle Stability Index (RSI):	68	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	5
2	0.5 ≤ D < 1.0	≥ 0.5	2
3	1.0 ≤ D < 2.0	< 0.5	1
4	1.0 ≤ D < 2.0	≥ 0.5	1
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	1

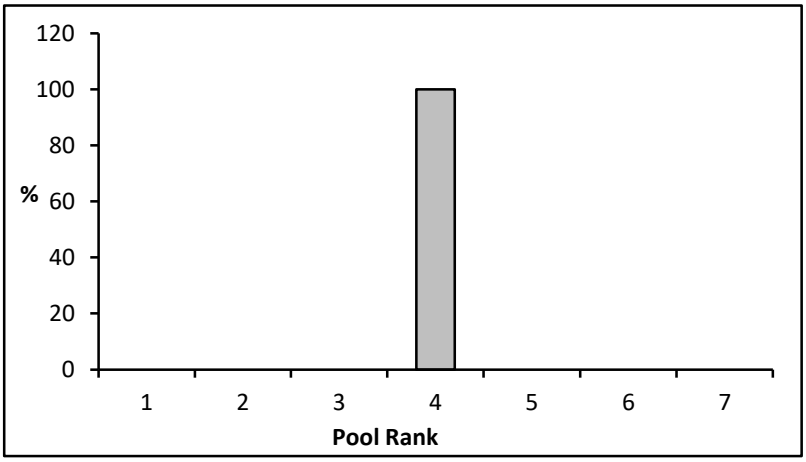
 # LWDs/mile: 11



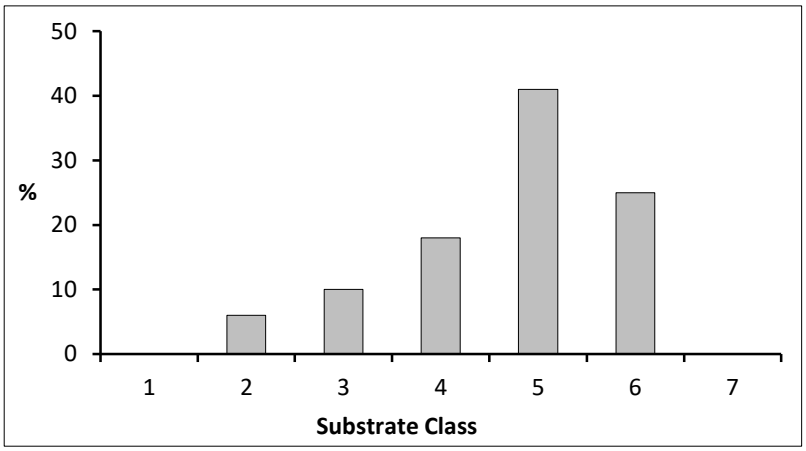
Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	0
4	2.0 ≤ D < 3.0	≥ 0.5	2
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 2.26173



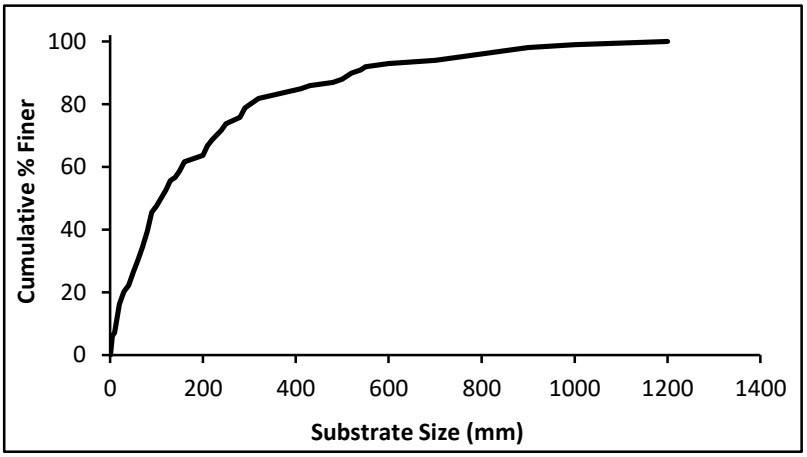
Reach/Segment Information	
SGA ID:	T14.02
Length (ft):	10,803
Reference Bedform Type:	Riffle
Total RHA Score:	91
RHA Percentage:	57%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	6
F. Gravel	2 - 16	10
C. Gravel	16 - 64	18
Cobble	64 - 256	41
Boulder	256 - 4096	25
Bedrock	> 4096	0

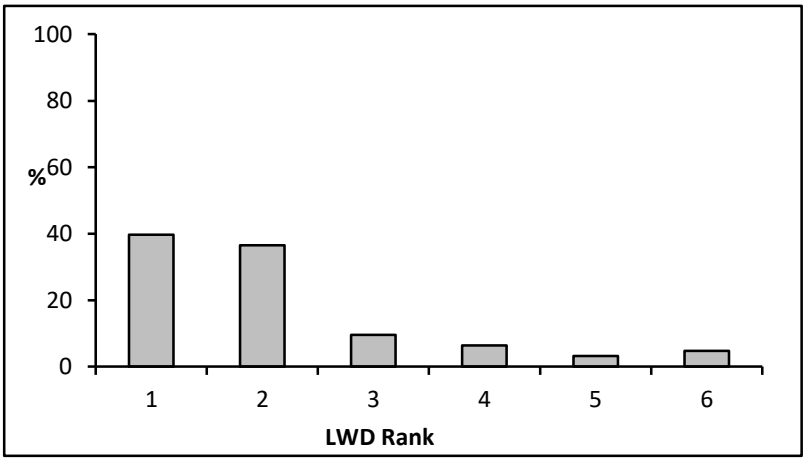
Median Substrate Size:	100	mm
Avg. Largest Particle (Bar):	130	mm
Riffle Stability Index (RSI):	56	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	25
2	0.5 ≤ D < 1.0	≥ 0.5	23
3	1.0 ≤ D < 2.0	< 0.5	6
4	1.0 ≤ D < 2.0	≥ 0.5	4
5	D ≥ 2.0	< 0.5	2
6	D ≥ 2.0	≥ 0.5	3

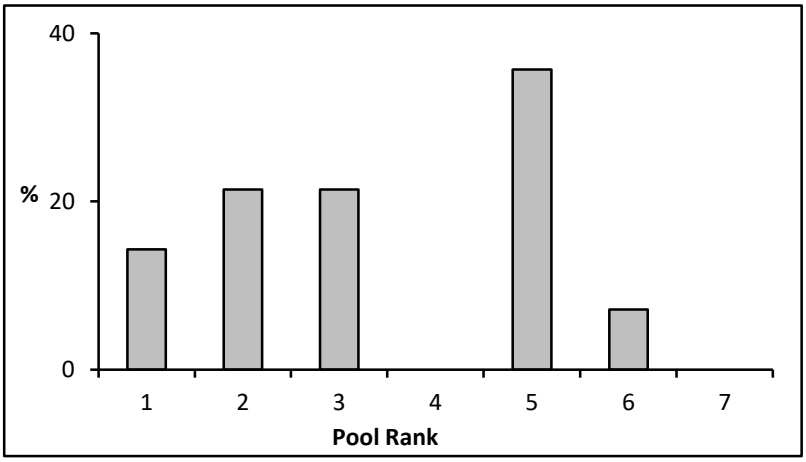
 # LWDs/mile: 31



Pools

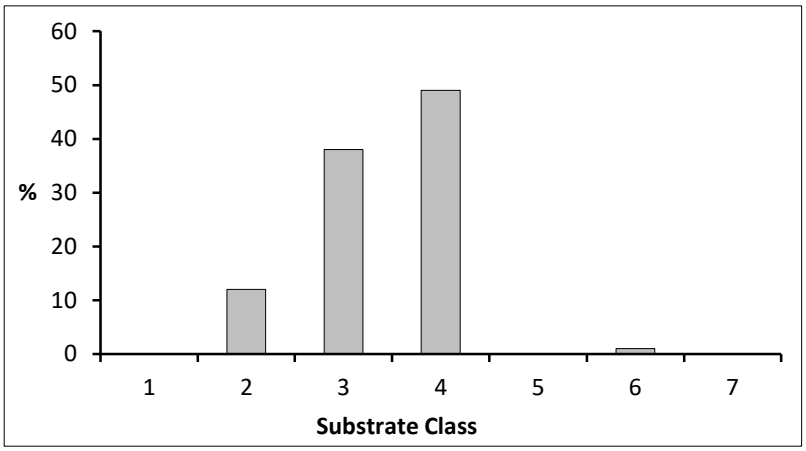
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	3
3	2.0 ≤ D < 3.0	< 0.5	3
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	5
6	D ≥ 3.0	≥ 0.5	1
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 6.84254



Reach/Segment Information

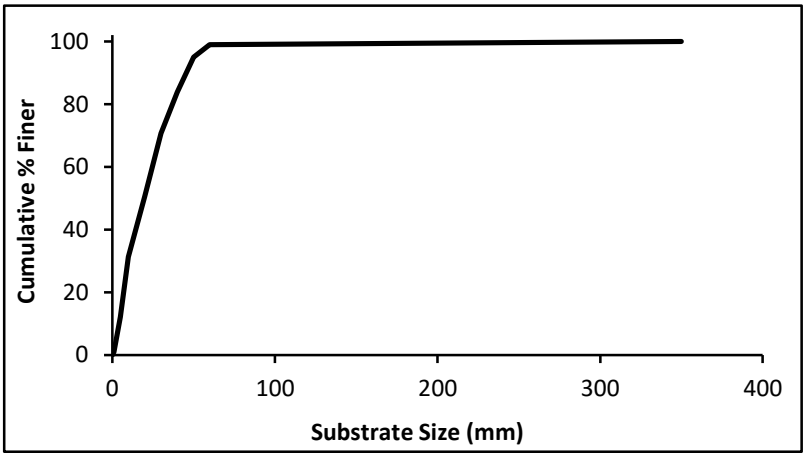
SGA ID:	T14.04
Length (ft):	4,676
Reference Bedform Type:	Riffle Pool
Total RHA Score:	77
RHA Percentage:	48%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	12
F. Gravel	2 - 16	38
C. Gravel	16 - 64	49
Cobble	64 - 256	0
Boulder	256 - 4096	1
Bedrock	> 4096	0

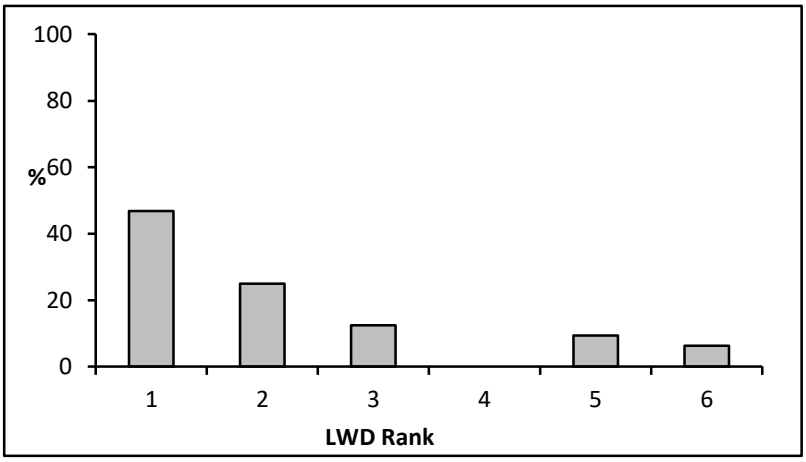
Median Substrate Size:	15	mm
Avg. Largest Particle (Bar):	20	mm
Riffle Stability Index (RSI):	51	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	15
2	0.5 ≤ D < 1.0	≥ 0.5	8
3	1.0 ≤ D < 2.0	< 0.5	4
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	3
6	D ≥ 2.0	≥ 0.5	2

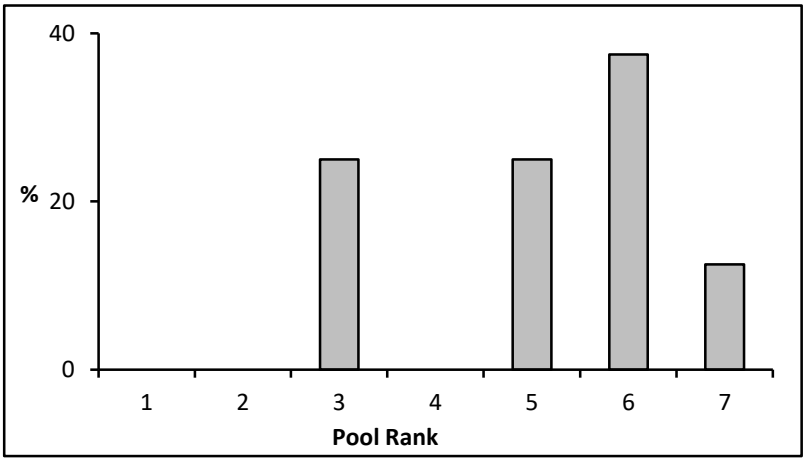
 # LWDs/mile: 36



Pools

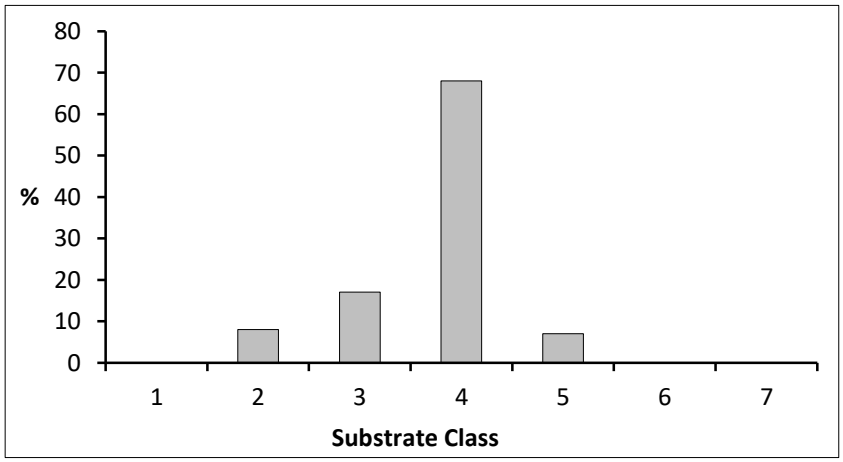
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	0
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	2
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	2
6	D ≥ 3.0	≥ 0.5	3
7	D ≥ 3.0	≥ 1.0	1

 # Pools/mile: 9.03336



Reach/Segment Information

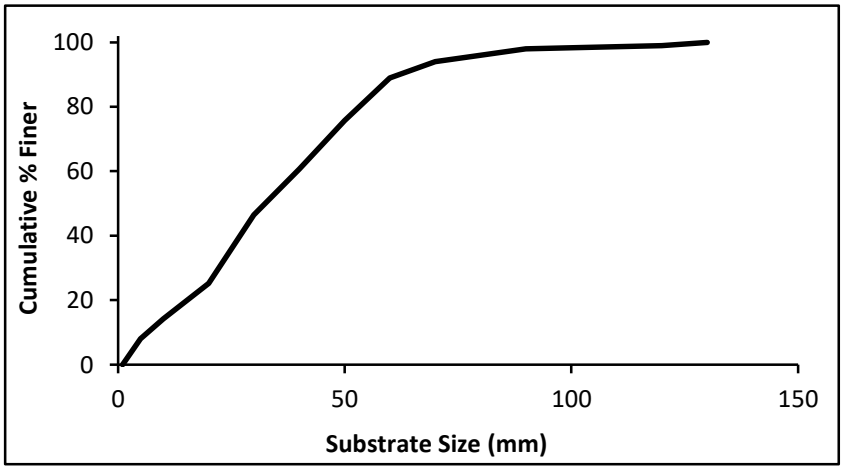
SGA ID:	T14.05
Length (ft):	4,676
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	91
RHA Percentage:	57%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	0
Sand	0.06 - 2	8
F. Gravel	2 - 16	17
C. Gravel	16 - 64	68
Cobble	64 - 256	7
Boulder	256 - 4096	0
Bedrock	> 4096	0

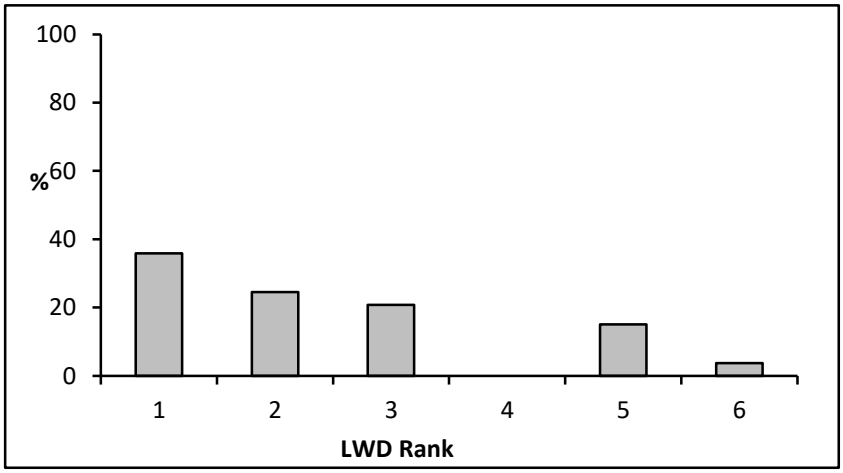
Median Substrate Size:	30	mm
Avg. Largest Particle (Bar):	40	mm
Riffle Stability Index (RSI):	61	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	19
2	0.5 ≤ D < 1.0	≥ 0.5	13
3	1.0 ≤ D < 2.0	< 0.5	11
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	8
6	D ≥ 2.0	≥ 0.5	2

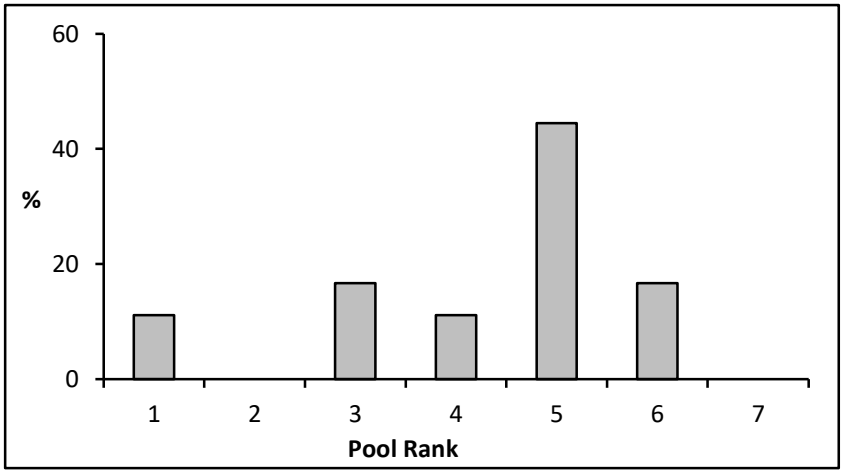
 # LWDs/mile: 60



Pools

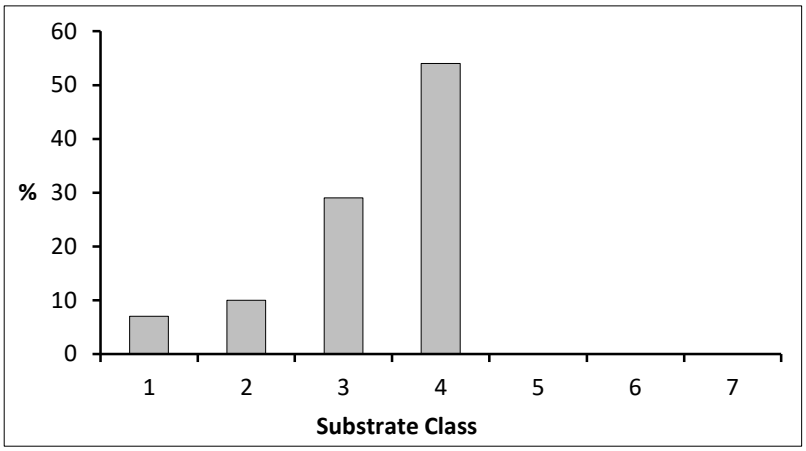
Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	2
2	1.0 ≤ D < 2.0	≥ 0.5	0
3	2.0 ≤ D < 3.0	< 0.5	3
4	2.0 ≤ D < 3.0	≥ 0.5	2
5	D ≥ 3.0	< 0.5	8
6	D ≥ 3.0	≥ 0.5	3
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 20.3251



Reach/Segment Information

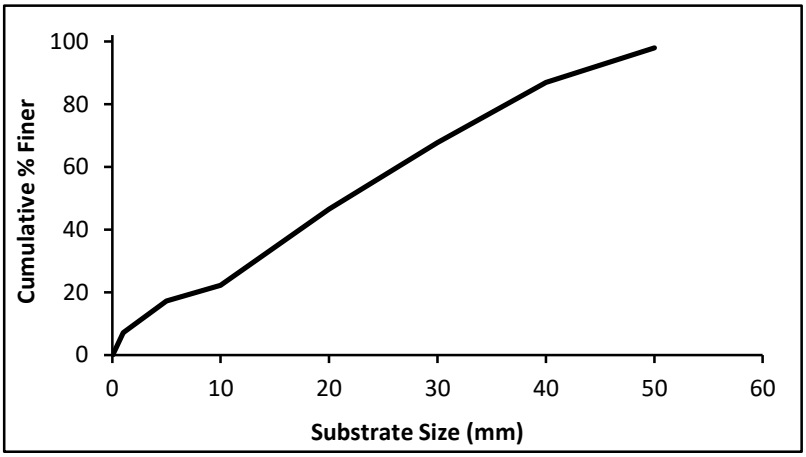
SGA ID:	T14.S3.01
Length (ft):	2,058
Reference Bedform Type:	Riffle-Pool
Total RHA Score:	69
RHA Percentage:	43%
Overall Habitat Condition:	Fair



Sediment Composition and Mobility

Class	Range (mm)	Percent
Silt	< 0.06	7
Sand	0.06 - 2	10
F. Gravel	2 - 16	29
C. Gravel	16 - 64	54
Cobble	64 - 256	0
Boulder	256 - 4096	0
Bedrock	> 4096	0

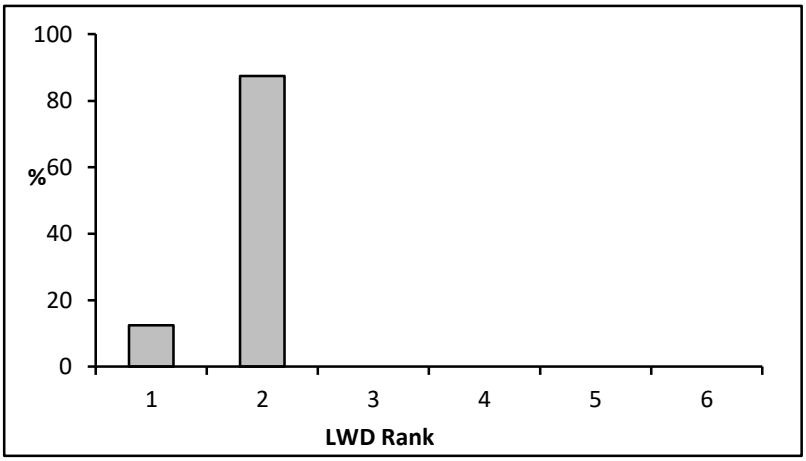
Median Substrate Size:	20	mm
Avg. Largest Particle (Bar):	40	mm
Riffle Stability Index (RSI):	87	%



Large Woody Debris (LWD)

Rank	Diameter (ft)	L (W_{bkf})	#
1	0.5 ≤ D < 1.0	< 0.5	1
2	0.5 ≤ D < 1.0	≥ 0.5	7
3	1.0 ≤ D < 2.0	< 0.5	0
4	1.0 ≤ D < 2.0	≥ 0.5	0
5	D ≥ 2.0	< 0.5	0
6	D ≥ 2.0	≥ 0.5	0

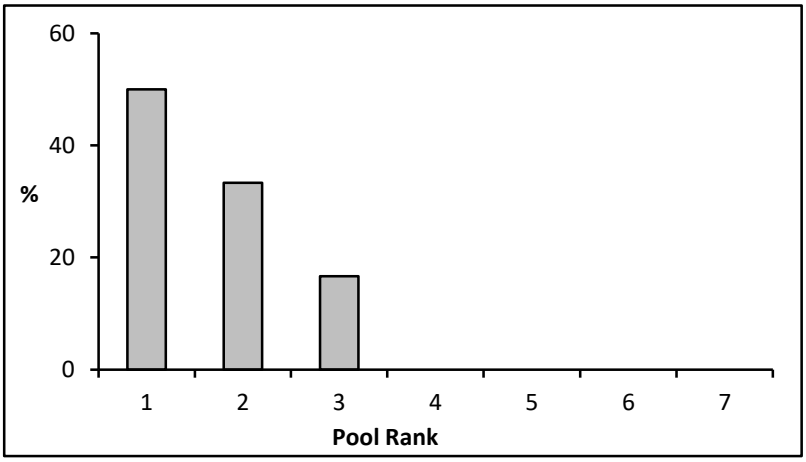
 # LWDs/mile: 21



Pools

Rank	Depth (ft)	L (W_{bkf})	#
1	1.0 ≤ D < 2.0	< 0.5	6
2	1.0 ≤ D < 2.0	≥ 0.5	4
3	2.0 ≤ D < 3.0	< 0.5	2
4	2.0 ≤ D < 3.0	≥ 0.5	0
5	D ≥ 3.0	< 0.5	0
6	D ≥ 3.0	≥ 0.5	0
7	D ≥ 3.0	≥ 1.0	0

 # Pools/mile: 30.7872



APPENDIX C:

VTDEC QA Review

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **TOWNSHEND**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R10**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Townshend**
1.3 Downstream Latitude: **43.06197**
1.3 Downstream Longitude: **-72.70107**

Step 2. Stream Type

2.1 Elevation Upstream: **521**
2.1 Elevation Downstream: **478**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **10,099.0** ft. **1.91** Miles
2.3 Valley Slope: **0.4**
2.4 Channel Length: **10,691.0** ft. **2.02** Miles
2.5 Channel Slope: **0.40 %**
2.6 Sinuosity: **1.06**
2.7 Watershed Area: **273.0** Square Miles
2.8 Channel Width: **154.6** feet
2.9 Valley Width: **1,542.0** feet
2.10 Confinement Ratio: **10.0**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **78.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **72.0** %
Flooding: **Frequent** **78.0** %
Water Table Deep: **6.0** **59.0** %
Water Table Shallow: **6.0** **59.0** %
Erodibility: **slight** **15.0** %

7.4 Comments:
Bank heights of 2-6 ft. observed, but no erosion observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **87.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **32.0** %
Current Sub-Dominant Land Cover: **Wetland**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**51-100**
Length w / less than 25 ft.:	**379.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **389.2** **3.6** %
Left: **389.2** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,664.6** ft. **24.9**

	One Side	Both Sides
Road:	**2,664.6** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **999.5** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Migration**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **1874.4261475** ft
7.2 Bank Height: **8** ft
7.3 Ice/Debris Jam Potential: **Shallow**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	1 Low	1 Low	1 Low	0 N.D.	0 N.D.	1 Low	1 Low	10

Summary of comments: 2024-08-08_West_River_QA.pdf

Page:3

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-13 14:49:31

General question for entire project: Were there any valley wall updates? The SGA and FEH valley walls are identical in the FIT, so it is unclear if and where updates were made.

Author: Joe Subject: Joe Date: 2024-12-02 10:51:30

DMS wasn't letting us upload the original VW, we do have them. "WestRiverValleyWallFinal"

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 08:05:41

Please include a note describing the segmenting that happened in P2

Author: Joe Subject: Joe Date: 2024-11-26 14:43:47

done

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R10-A**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB JWC**
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **impounded**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	**0**			
Road:	**0**			
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**0**			

1.4 Adjacent Side — Left — Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **West River** Reach: **R10-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):		2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):		2.12 Substrate Composition		Bed:	
2.3 Mean Depth (tf):		Bedrock:	%	Bar:	
2.4 Floodprone Width (ft.):		Boulder:	%	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):		Cobble:	%	Stream Type:	
Human Elev FloodPln (ft.):		Coarse Gravel:	%	Bed Material:	
2.6 Width/Depth Ratio:	**0.00**	Fine Gravel:	%	Subclass Slope:	
2.7 Entrenchment Ratio:	**0.00**	Sand:	%	Bed Form:	
2.8 Incision Ratio:	**0.00**	Silt and Smaller:	%	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type	
2.9 Sinuosity:		Detritus:	%	Reference Stream Type:	
2.10 Riffles Type:		# Large Woody Debris:		Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope:

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:		
Material Type:			Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:		
Consistency:			Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:		
Material Type:						Mid-Channel Canopy:		
Consistency:								

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant		
Sub-Dominant		

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant		
Sub-dominant		
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R10-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:
4.2 Adjacent Wetlands:
4.3 Flow Status:
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.:
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal:
Mid: Delta:
Point: Island:
Side: Braiding: **0**

5.2 Other Features
Flood chutes: **0**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score:
Habitat Rating:
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating
Channel Evolution Model
Channel Evolution Stage
Geomorphic Condition
Stream Sensitivity

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R10-B**
Segment Length(ft): **7,032**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: 1
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 30 from Worden Lane to where the water begins to be impounded north of the Townshend dam.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically incised and shows evidence of significant active aggradation and widening.**2

Step 1. Valley and Floodplain

1.1 Segmentation: 3

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**0**4		
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**999**		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Steep**	**Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **1,542**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 08:42:11

Please add date

Author: Jake Date: 2024-09-10 14:53:02

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 14:48:51

Date added

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 10:15:13

Consider including in comment:
Segment is likely tail-watered by Townshend dam at high flows.
There are high sediment inputs from Wardsboro Brook upstream.

Author: Jake Date: 2024-09-10 14:53:08

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 14:47:56

Added to narrative

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:05:24

Please add segmentation reason

Number: 4 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 15:54:33

Should the Army Corps road be added?

Stream: **West River** Reach: **R10-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**156.00**	2.11 Riffle/Step Spacing:	**600 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.50**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**3.37**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**165.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**10.70**	Cobble:	**55.0 %**	Stream Type:	**F1**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**46.29**	Fine Gravel:	**4.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.06**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.38**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**14**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**883.5**	**990.9**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**8.5**	**9.0**	Sub-dominant:	**Shrubs/Sapling**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**389.2**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**None**
W less than 25	**379**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**25.0**	Gullies Length	**0**	
Gullies	**None**				

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 14:15:06

Do you think this could fit a D type with the very high W/D, low sinuosity, and aggradation? Understanding it might not be the typical setting due to the influence of Townshend dam, which appears to affect R10-R13A.

Author: Joe Subject: Joe Date: 2024-11-26 16:03:53

I think this is too affected by the dam to really know if a D is possible here. Leaving as F but don't have a strong feeling either way.

Stream: **West River** Reach: **R10-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal** 1	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:		Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**15**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**B to F** 2	**Yes**	Geomorphic Rating	**0.39**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	
Total Score		**31**			Stream Sensitivity	

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-11 10:54:04

Should P1 4.4 be updated?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-11 11:08:08

B to F departure noted.
Should reference stream type or subreach stream type be updated? Or should this be C to F?

Author: Joe Subject: Joe Date: 2024-12-02 11:36:25

changed to reference Bc

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **TOWNSHEND**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R11**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Jamaica, Townshend**
1.3 Downstream Latitude: **43.08100**
1.3 Downstream Longitude: **-72.71831**

Step 2. Stream Type

2.1 Elevation Upstream: **553**
2.1 Elevation Downstream: **521**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **5,196.0** ft. **0.98** Miles
2.3 Valley Slope: **0.6**
2.4 Channel Length: **5,570.0** ft. **1.05** Miles
2.5 Channel Slope: **0.57 %**
2.6 Sinuosity: **1.07**
2.7 Watershed Area: **264.6** Square Miles
2.8 Channel Width: **152.5** feet
2.9 Valley Width: **1,034.0** feet
2.10 Confinement Ratio: **6.8**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **50.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Flat**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **51.0** %
Flooding: **Frequent** **50.0** %
Water Table Deep: **6.0** **97.0** %
Water Table Shallow: **6.0** **97.0** %
Erodibility: **Moderate** **48.0** %
7.4 Comments:
Bank heights of 2-8 ft. observed but no erosion observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **87.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **45.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,381.3** ft. **42.8**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	**2,381.3** ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **2,046.6** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **889.5103760** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Shallow**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	2 High	2 High	1 Low	0 N.D.	0 N.D.	1 Low	1 Low	12

Page:10

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 15:51:39

Is there a berm in the floodplain?

Author: Joe Subject: Joe Date: 2024-12-02 12:02:59

No, it's not in FIT and will be removed from Ph1

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R11-0**
Segment Length(ft): **5,570**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: 1
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 30 from the confluence with Wardsboro Brook to Worden Ln.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically incised and and is actively aggrading and widening.** 2

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		**0**			
Road:		**0**			
Railroad:		**0**			
Imp. Path:		**0**			
Dev.:		**2,047**			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Extr.Steep**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Never**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **1,034**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Page:11

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 08:41:57

Please add date

Author: Jake Date: 2024-09-10 14:53:31

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 14:51:32

Date added

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 10:15:04

Consider adding to narrative:
There are high sediment inputs from Wardsboro Brook. A very large delta bar is present at the mouth of Wardsboro Brook.

Author: Jake Date: 2024-09-10 14:53:37

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 14:52:33

Added to narrative

Stream: **West River** Reach: **R11-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**189.00**	2.11 Riffle/Step Spacing:	**500 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.20**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**1.83**	Bedrock:	**0.0 %**	Bar:	**350**	**mm**
2.4 Floodprone Width (ft.):	**240.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**8.00**	Cobble:	**37.0 %**	Stream Type:	**B** 1	
Human Elev FloodPln (ft.):		Coarse Gravel:	**47.0 %**	Bed Material:	**Gravel** 2	
2.6 Width/Depth Ratio:	**103.28**	Fine Gravel:	**6.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.27**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.90**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**15**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**669.3**	**220.2**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**3.6**	**4.0**	Sub-dominant:	**None**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None** 3
(Legacy)	Amount	Mean Hieght
Failures	**One**	**20.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Page:12

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 14:15:21

Do you think this could fit a D type with the very high W/D, low sinuosity, and aggradation? Understanding it might not be the typical setting due to the influence of Townshend dam, which appears to affect R10 - R13A comparing dam elevation to bed elevation.

Author: Joe Subject: Joe Date: 2024-12-02 12:08:33

I think the extreme deposition is a relic of recent floods and that by reference it is a single thread channel with aggradation.

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-11 11:10:40

Do you think reference is still cobble and gravel is associated with the sediment inputs and tailwater from Townshend?

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 14:18:29

Should P1 be changed?

Author: Jake Date: 2024-09-10 15:38:29

Deferred set by Jake

Stream: **West River** Reach: **R11-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid: **1**	Delta:	**1**	Flood chutes: **1**	Avulsion:	**0**	5.5 Straightening:		**None**	
Point:	Island:	**1**	5.3 Steep Riffles and Head Cuts	Head Cuts:	**0**	Straightening Length (ft.):		**0**	
Side: **3**	Braiding:	**0**	Steep Riffles: **0**	Trib Rejuv.:		5.5 Dredging:		**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.39**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	1
Total Score		**31**			Stream Sensitivity	

Page:13

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-10-02 13:51:00

Thank you for adding to the DMS!

Fair/High

Author: Jake Date: 2024-09-10 14:56:07

Completed set by Jake

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **TOWNSHEND**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R12**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Jamaica**
1.3 Downstream Latitude: **43.07297**
1.3 Downstream Longitude: **-72.73357**

Step 2. Stream Type

2.1 Elevation Upstream: **554**
2.1 Elevation Downstream: **553**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,486.0** ft. **0.47** Miles
2.3 Valley Slope: **0.0**
2.4 Channel Length: **2,498.0** ft. **0.47** Miles
2.5 Channel Slope: **0.04 %**
2.6 Sinuosity: **1.00**
2.7 Watershed Area: **228.7** Square Miles
2.8 Channel Width: **143.0** feet
2.9 Valley Width: **992.0** feet
2.10 Confinement Ratio: **6.9**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Ice-Contact** **57.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **A** **57.0** %
Flooding: **None/Rare** **62.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Severe** **52.0** %
7.4 Comments:

Bank heights 2-6 ft., but no erosion observed. Flood chute upstream of Rt. 100 bridge.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **87.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **36.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **11.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **631.5** ft. **25.3**

	One Side	Both Sides
Road:	**631.5** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,277.8** ft. **0.0** ft.
6.3 Channel Bars: **None** 1
6.4 Meander Migration: **None**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **No Data** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	1 Low	9

Page:14

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-11 11:11:22

P2 data indicates multiple channel bars.

Author: Jake Date: 2024-09-10 15:05:34

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:06:01

Set to side with not significant impact

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R12-0**
Segment Length(ft): **2,498**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: 1
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the confluence with Turkey Mountain Brook to the the confluence with Wardsboro brook.**

Step 5 - Notes:

Step 7 - Narrative: 2

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	632	10	1,711	15
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,278		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Very Steep**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Never**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features	
Valley Width (ft):	**702**
Width Determination:	**Measured**
Confinement Type:	**NW**
In Rock Gorge:	**No**

Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Page:15

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 08:41:31

Please add date

Author: Jake Date: 2024-09-10 15:08:05

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:08:11

Date added

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-19 16:15:07

Thank you for adding a narrative in the DMS! This PDF was downloaded prior to the addition.

From DMS: "The reach is historically incised with evidence of active aggradation from numerous large bar deposits of cobble material. Minimal erosion or migration indicates that the reach remains in Stage II."

Author: Jake Date: 2024-09-10 15:07:17

Completed set by Jake

Stream: **West River** Reach: **R12-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**156.00**	2.11 Riffle/Step Spacing:	**600 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.24**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**215.00**	Boulder:	**9.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.00**	Cobble:	**53.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**26.0 %**	Bed Material:	**Cobble** 1	
2.6 Width/Depth Ratio:	**69.64**	Fine Gravel:	**1.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.38**	Sand:	**6.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.33**	Silt and Smaller:	**5.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:		Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50** 3	**51-100**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest** 2
Sub-dominant	**None**	**None** 4
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 16:02:13

Should reference bed material be updated?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 14:27:53

Should P1 be changed?

Author: Jake Date: 2024-09-10 15:40:02

Deferred set by Jake

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 14:27:37

Should P1 be changed?

Author: Jake Date: 2024-09-10 15:38:35

Deferred set by Jake

Author: Joe Subject: Joe Date: 2024-12-02 13:34:11

P1 value resets when saved

Number: 4 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-10 14:28:01

Should P1 be changed?

Author: Jake Date: 2024-10-02 14:01:58

Deferred set by Jake

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R12-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal** 1
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **1**
Mid: **2**
Delta: **1**
Point:
Island:
Side: **5**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **1**
Avulsion: **0**

5.3 Steep Riffles and Head Cuts
Head Cuts: **0**
Steep Riffles: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type — Left — Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type: **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**8**	**None**	**Yes**
7.2 Channel Aggradation	**8**	**None**	**No**
7.3 Widening Channel	**8**	**None**	**No**
7.4 Change in Planforml	**9**	**None**	**No**
Total Score	**33**		

Geomorphic Rating: **0.41**
Channel Evolution Model: **F**
Channel Evolution Stage: **II** 2
Geomorphic Condition 3
Stream Sensitivity

Page:17

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-11 11:32:54

Should P1 4.4 be updated?

Author: Jake Date: 2024-10-02 14:06:49

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 09:54:56

Should this be stage III? Seemed like a lot of the same processes going on upstream and downstream with the wide channel and aggradation are also active here.

Author: Joe Subject: Joe Date: 2024-12-02 13:36:01

agreed, updated

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:38:34

Thank you for adding to the DMS!

Fair/High

Author: Jake Date: 2024-09-10 15:13:52

Completed set by Jake

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **JAMAICA, TOWNSHEND**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R13**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Jamaica**
1.3 Downstream Latitude: **43.07630**
1.3 Downstream Longitude: **-72.74160**

Step 2. Stream Type

2.1 Elevation Upstream: **683**
2.1 Elevation Downstream: **554**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **14,992.0** ft. **2.84** Miles
2.3 Valley Slope: **0.9**
2.4 Channel Length: **15,258.0** ft. **2.89** Miles
2.5 Channel Slope: **0.85 %**
2.6 Sinuosity: **1.02**
2.7 Watershed Area: **214.1** Square Miles
2.8 Channel Width: **138.9** feet
2.9 Valley Width: **1,195.0** feet
2.10 Confinement Ratio: **8.6**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Ice-Contact** **47.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **A** **46.0** %
Flooding: **None/Rare** **71.0** %
Water Table Deep: **6.0** **86.0** %
Water Table Shallow: **6.0** **86.0** %
Erodibility: **Moderate** **38.0** %
7.4 Comments:
Bank heights generally 2-4 ft., but some > 15 ft. observed, but no erosion. 1

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **87.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **40.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**115.0** ft.	**2,336.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **5** **18.0** %
5.3 Bank Armoring: **1,121.3** **7.3** %
Left: **374.5** ft. Right: **746.8** ft.
5.4 Channel Straightening: **3,083.0** **20.2** %
5.5 Dredging History: **Dredging**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **8,000.0** ft. **52.4**

	One Side	Both Sides
Road:	**8,000.0** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **691.4** ft. **3,428.1** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **None**
6.5 Meander Width: **663 ft.** Ratio: **4.8**
6.6 Wavelength: **3608 ft.** Ratio: **26.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **327.4025879** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	1 Low	1 Low	2 High	2 High	2 High	2 High	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	1 Low	18

Page:18

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 08:09:38

Please include a note describing the segmenting that happened in P2

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R13-A**
Segment Length(ft): **4,014**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: **8/16/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the VT 30 bridge to the confluence with Turkey Mountain Brook**

Step 5 - Notes:

Step 7 - Narrative: **The channel is over widened with signs of active aggradation and some widening.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Corridor Encroachment**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	2,557	12	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	691		394	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **1,088**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **West River** Reach: **R13-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**117.00** 1	2.11 Riffle/Step Spacing:	**750 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.50**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.70**	Bedrock:	**0.0 %**	Bar:	**450**	**mm**
2.4 Floodprone Width (ft.):	**800.00**	Boulder:	**8.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.80**	Cobble:	**40.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**31.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**43.33**	Fine Gravel:	**15.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**6.84**	Sand:	**6.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.37**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type: 2		# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**166.1**	**161.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**4.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**87**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant 3		**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 15:26:14

Do you think the reference width is too high? Note states the channel is over widened, but width is less than reference width.

Author: Joe Subject: Joe Date: 2024-12-02 13:53:16

updated language

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 09:10:16

Value?

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 09:10:32

Left buffer value?

Author: Jake Date: 2024-09-10 15:18:36

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:18:44

Updated to None

Stream: **West River** Reach: **R13-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid: **1**	Delta:	Flood chutes:	**0**	Avulsion:	**1** 1	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**650**
Side: **7**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition 2	
Total Score		**36**			Stream Sensitivity	

Page:21

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 10:29:38

Do you think this might be a flood chute?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:38:56

Thank you for adding to the DMS!

Fair/Very High

Author: Jake Date: 2024-09-10 15:19:01

Completed set by Jake

Phase 2 Segment Summary Report West River 1

Stream: West River
Reach: R13-B
Segment Length(ft): 11,243
Rain: No
Segment Version: Base

SGAT Version: 4.53
Organization:
Observers: EHB, JWC, RS
Completion Date: 10/19/2022
Qualtiy Control Status - Consultant: Provisional
Qualtiy Control Status - Staff: Provisional

Step 0 - Location: **From the Depot Street bridge to the VT 30 bridge.**

Step 5 - Notes:

Step 7 - Narrative: **Channel 2 is moderately incised (historic) with active aggradation and limited evidence of widening.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	1,734	11	1,058	16
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		3,034	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Hilly
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): 1,255
Width Determination: Measured
Confinement Type: BD
In Rock Gorge: No
Human Caused Change in Valley Width?: No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Page:22

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-07 13:15:29

FIT - Add development impacts at island drive, meadows drive as needed

Author: Joe Subject: Joe Date: 2024-12-02 13:58:18

updated

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 10:16:10

Consider adding to narrative:
There is a large flood chute from the Ball Mountain Brook delta to just upstream of the manufactured housing units along Route 100. This may account for the reduced main channel width in segment B.

From the manufactured housing units to the downstream end of the segment there is encroachment and extensive bank stabilization. (Did you decide not to include the alternate cross section? Not seeing it in the worksheet.)

There are high sediment inputs from Ball Mountain Brook and a large delta bar at the confluence.

Author: Jake Date: 2024-09-10 15:21:43

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:21:54

Added to narrative

Stream: **West River** Reach: **R13-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**91.00**	2.11 Riffle/Step Spacing:	**1000 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.60**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**2.53**	Bedrock:	**0.0 %**	Bar:	**260**	**mm**
2.4 Floodprone Width (ft.):	**260.00**	Boulder:	**11.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.80**	Cobble:	**62.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**22.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**35.97**	Fine Gravel:	**3.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.86**	Sand:	**2.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.61**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	**1**	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**23**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Coniferous**	**Coniferous** 1
Consistency: 2	**Non-cohesive**		Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**374.5**	**746.8**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**							

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**51-100**	**0-25** 3
W less than 25	**115**	**2,249**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:23

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:29:31

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-09-10 15:25:11

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 09:11:11

Value for right? Upper and lower

Author: Jake Date: 2024-09-10 15:25:47

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:25:41

Changed both to Non-cohesive

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-12 08:24:12

Should P1 4.3 be updated?

Author: Jake Date: 2024-09-10 15:40:17

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:08:35

Value resets to original value after saving

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R13-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**7**	Delta:		Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**2,433**
Side:	**9**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**None**	**Yes**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**Yes**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	1
Total Score		**37**			Stream Sensitivity	

Page:24

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:39:20

Thank you for adding to the DMS!

Fair/High

Author: Jake Date: 2024-09-10 15:26:56

Completed set by Jake

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R18**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.15815**
1.3 Downstream Longitude: **-72.79680**

Step 2. Stream Type

2.1 Elevation Upstream: **1,004**
2.1 Elevation Downstream: **956**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **10,255.0** ft. **1.94** Miles
2.3 Valley Slope: **0.5**
2.4 Channel Length: **10,349.0** ft. **1.96** Miles
2.5 Channel Slope: **0.46 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **100.9** Square Miles
2.8 Channel Width: **99.7** feet
2.9 Valley Width: **360.0** feet
2.10 Confinement Ratio: **3.6**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **56.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **A** **56.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **99.0** %
Water Table Shallow: **6.0** **99.0** %
Erodibility: **Very Severe** **93.0** %
7.4 Comments:
Bank heights 2-6 ft., but no erosion observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **87.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **47.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**764.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **457.6** **4.4** %
Left: **457.6** ft. Right: **0.0** ft.
5.4 Channel Straightening: **13.1** **0.1** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **7,014.4** ft. **67.8**

	One Side	Both Sides
Road:	**7,014.4** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **146.2** ft. **0.0** ft.
6.3 Channel Bars: **Point**
6.4 Meander Migration: **None**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **207.9073029** ft
7.2 Bank Height: **6** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	6

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R18-0**
Segment Length(ft): **10,348**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB/RS**
Completion Date: **9/22/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the confluence with T12 to the confluence with the Winhall River.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is very straight, potentially naturally so, and has very limited access to narrow floodplain benches. Coarse substrate and potentially some underlying grade control limit future incision. The channel has limited space to adjust planform or aggrade**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**3,759**	**9**	
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**146**		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Very Steep**	**Very Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **360**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **West River** Reach: **R18-01**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**112.00**	2.11 Riffle/Step Spacing:	**750 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.00**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.96**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**136.00**	Boulder:	**18.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**51.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**20.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**37.84**	Fine Gravel:	**1.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.21**	Sand:	**9.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.75**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**9**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**
Consistency:	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**
Consistency:	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft.):	**207.9**	**0.0**
Erosion Height (ft.):	**6.0**	**0.0**
Revetment Type:	**Rip-Rap**	**None**
Revetment Length:	**457.6**	**0.0**

Near Bank Vegetation Type	Left	Right
Dominant:	**Deciduous**	**Deciduous**
Sub-dominant:	**None**	**None**
Bank Canopy		
Canopy %:	**1-25**	**1-25**
Mid-Channel Canopy:	**Open**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25** 3
W less than 25	**764**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**Commercial** 2
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Page:27

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:13:54

Are there no valley walls for R18? Not seeing in GDB.

Author: Jake Subject: Jake Date: 2024-09-10 15:31:18

@Joe there is a valley wall present for this reach in the PhaseII_VW_20240115 layer in the West_River_Sketch_Pro project

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:29:36

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-09-10 15:27:32

Completed set by Jake

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 08:40:38

Should P1 4.3 be updated?

Author: Jake Date: 2024-09-10 15:40:44

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:10:18

Value resets to original value after saving changes

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R18-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**8**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**13**
Side: 1 **4**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**B to F**	**Yes**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition 2	
Total Score		**37**			Stream Sensitivity	

Page:28

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 08:42:25

Should P1 6.3 be updated?

Author: Jake Date: 2024-09-10 15:34:02

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:33:57

Updated to Side

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:39:43

Thank you for adding to the DMS!

Fair/Extreme

Author: Jake Date: 2024-09-10 15:31:34

Completed set by Jake

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Trib 12 to West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T12.01**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.18497**
1.3 Downstream Longitude: **-72.80267**

Step 2. Stream Type

2.1 Elevation Upstream: **1,022**
2.1 Elevation Downstream: **1,001**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **962.0** ft. **0.18** Miles
2.3 Valley Slope: **2.2**
2.4 Channel Length: **977.0** ft. **0.19** Miles
2.5 Channel Slope: **2.15 %**
2.6 Sinuosity: **1.02**
2.7 Watershed Area: **9.0** Square Miles
2.8 Channel Width: **34.5** feet
2.9 Valley Width: **140.0** feet
2.10 Confinement Ratio: **4.1**
2.10 Confinement Type: **Narrow**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Ice-Contact** **62.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **A** **62.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Very Severe** **99.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **85.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **35.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: **1** **2.5** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: 2
6.4 Meander Migration:
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **No Data** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	3

Page:29

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:29:33

Please update 4.3 with P2 data (Step 3.3)

Author: Jake Date: 2024-09-10 15:40:53

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:12:53

Resets to blank when saved after updating

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:46:58

Please update 6.3 with P2 data (Step 5.1)

Author: Jake Date: 2024-09-10 15:38:07

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:37:58

Updated to side, not significant

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.01-0**
Segment Length(ft): **977**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **9/22/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Thompsonburg Road to confluence with West River**

Step 5 - Notes:

Step 7 - Narrative: **The reach is moderately incised, but appears stable with no evidence of active widening, incision, or planform adjustment. Coarse substrate was observed for most of the bed and banks and nice step pool sequences in the lower portion and riffle pool in the upper portion. The reach appears stable.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	**0**			
Road:	**920**	**5**		
Railroad:	**0**			
Imp. Path:	**0**			
Dev.:	**0**			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Very Steep**	**Very Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Always**	**Always**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **118**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**2.5**	**1.0**	**No**	**No**

Page:30

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 09:13:15

Consider adding for T12 reaches: Also known as Thompsonburg Brook

Author: Jake Date: 2024-09-10 15:42:52

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:42:47

Added to all T12 reaches

Stream: Trib 12 to West River Reach: T12.01-0

Step 2. Stream Channel

2.1Bankfull Width (ft.):	21.20	2.11 Riffle/Step Spacing:	120 ft.	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	2.80	2.12 Substrate Composition		Bed:	400	mm
2.3 Mean Depth (tf):	1.70	Bedrock:	0.0 %	Bar:	200	mm
2.4 Floodprone Width (ft.):	36.00	Boulder:	27.0 %	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	4.05	Cobble:	35.0 %	Stream Type:	B	
Human Elev FloodPln (ft.):		Coarse Gravel:	19.0 %	Bed Material:	Cobble	
2.6 Width/Depth Ratio:	12.47	Fine Gravel:	9.0 %	Subclass Slope:		
2.7 Entrenchment Ratio:	1.70	Sand:	8.0 %	Bed Form:	Riffle-Pool	
2.8 Incision Ratio:	1.45	Silt and Smaller:	2.0 %	Field Measured Slope:		
Human Elevated Inc. Rat.:	0.00	Silt/Clay Present:	No	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	Low	Detritus:	5.0 %	Reference Stream Type:		
2.10 Riffles Type:	Complete	# Large Woody Debris:	6	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type:	Boulder/Cobble	Boulder/Cobble
Consistency:	Non-cohesive	Non-cohesive
Lower		
Material Type:	Boulder/Cobble	Boulder/Cobble
Consistency:	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft.):	0.0	0.0
Erosion Height (ft.):	0.0	0.0
Revetment Type:	None	None
Revetment Length:	0.0	0.0

Near Bank Vegetation Type	Left	Right
Dominant:	Deciduous	Deciduous
Sub-dominant:	None	None
Bank Canopy		
Canopy %:	51-75	51-75
Mid-Channel Canopy:	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	51-100	51-100
Sub-Dominant	0-25	>100
W less than 25	0	0
Buffer Vegitation Type		
Dominant	Deciduous	Deciduous
Sub-Dominant	None	None

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Forest
Sub-dominant	None	Residential
(Legacy)	Amount	Mean Hieght
Failures	None	
Gullies	None	

	Left	Right
Mass Failures		
Height		
Gullies Number	0	
Gullies Length	0	

Page:31

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 15:09:26

Are there no SGA valley walls or corridors for the T12 reaches? Not seeing these in the GIS GDB.

Author: Jake Subject: Jake Date: 2024-09-10 15:45:22

@Joe There are definitely valley walls in the same GIS layer mentioned previously

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:29:41

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-09-10 15:43:32

Completed set by Jake

Stream: **Trib 12 to West River** Reach: **T12.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **1**
Other: **0** Tile Drain: **0**
Overland Flow: **0** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid:
Delta:
Point:
Island:
Side: **1**
Braiding: **0**

5.2 Other Features
Flood chutes: **1**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**14**	**None**	**Yes**	Geomorphic Rating	**0.65**
7.2 Channel Aggradation		**14**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**I**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**52**			Stream Sensitivity	**Moderate**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Trib 12 to West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T12.02**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.18568**
1.3 Downstream Longitude: **-72.79924**

Step 2. Stream Type

2.1 Elevation Upstream: **1,042**
2.1 Elevation Downstream: **1,022**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,271.0** ft. **0.24** Miles
2.3 Valley Slope: **1.6**
2.4 Channel Length: **1,273.0** ft. **0.24** Miles
2.5 Channel Slope: **1.57 %**
2.6 Sinuosity: **1.00**
2.7 Watershed Area: **9.0** Square Miles
2.8 Channel Width: **34.4** feet
2.9 Valley Width: **85.0** feet
2.10 Confinement Ratio: **2.5**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **99.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **69.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **1.5** **69.0** %
Water Table Shallow: **1.0** **69.0** %
Erodibility: **Very Severe** **99.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **85.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **48.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**0.0** ft.	**538.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: **1** **1.9** %
5.3 Bank Armoring: **785.9** **61.7** %
Left: **0.0** ft. Right: **785.9** ft.
5.4 Channel Straightening: **274.1** **21.5** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: 2
6.4 Meander Migration:
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **No Data** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	9

Page:33

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:31:24

Please update 4.3 with P2 data (Step 3.2)

Author: Jake Date: 2024-10-02 14:14:00

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:14:29

Resets to blank when saved after updating

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:47:19

Please update 6.3 with P2 data (Step 5.1)

Author: Jake Date: 2024-09-10 15:47:20

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:47:30

Set to side, not significant

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.02-0**
Segment Length(ft): **1,273**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: **10/24/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Thompsonburg Road bisected by Cross Road**

Step 5 - Notes:

Step 7 - Narrative: **Majority of the reach is encroached by Thompsonburg Rd with near continuous armoring along the right bank. It is very likely that the reach was straightened when the road was constructed, decreasing valley width, but not likely changing the reference stream type. The reach maintained access to an elevated bench for most of the left bank, but was incised. We assessed as Stage II due to historic incision.**

Step 1. Valley and Floodplain

1.1 Segmentation: **None**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0			
Road:	1,273	5		
Railroad:	0			
Imp. Path:	0			
Dev.:	0			

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Always	Always
Within 1 Bankfull W:	Always	Always
Texture:	Cobble	Cobble

1.5 Valley Features
Valley Width (ft): **60**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls: 1

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		8.0	3.0	No	No

Page:34

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-07 12:49:35

Need to add second grade control from FIT?

Author: Joe Date: 2024-12-03 11:37:16

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 11:37:08

Big DMS error to Enter/Edit GC

Stream: **Trib 12 to West River** Reach: **T12.02-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**25.00**	2.11 Riffle/Step Spacing:	**60 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**2.0 %**	Bar:	**110**	**mm**
2.4 Floodprone Width (ft.):	**52.00**	Boulder:	**23.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.00**	Cobble:	**36.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**10.04**	Fine Gravel:	**6.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.08**	Sand:	**10.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**1.88**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**11**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Coniferous**	**Shrubs/Sapling**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**785.9**	Canopy %:	**76-100**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**0**	**538**
Buffer Vegitation Type		
Dominant	**Coniferous**	**None**
Sub-Dominant	**None**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Residential**
Sub-dominant	**None**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Trib 12 to West River** Reach: **T12.02-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **None**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **1**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **1**
Other: **0** Tile Drain: **0**
Overland Flow: **0** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid:
Delta:
Point:
Island:
Side: **1**
Braiding: **0**

5.2 Other Features
Flood chutes: **0**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **Straightening**
Straightening Length (ft.): **274**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.54**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**43**			Stream Sensitivity	**High**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Trib 12 to West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T12.03**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.18883**
1.3 Downstream Longitude: **-72.79729**

Step 2. Stream Type

2.1 Elevation Upstream: **1,141**
2.1 Elevation Downstream: **1,042**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **5,663.0** ft. **1.07** Miles
2.3 Valley Slope: **1.7**
2.4 Channel Length: **5,958.0** ft. **1.13** Miles
2.5 Channel Slope: **1.66 %**
2.6 Sinuosity: **1.05**
2.7 Watershed Area: **8.9** Square Miles
2.8 Channel Width: **34.2** feet
2.9 Valley Width: **230.0** feet
2.10 Confinement Ratio: **6.7**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **64.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **B** **56.0** %
Flooding: **None/Rare** **72.0** %
Water Table Deep: **1.5** **43.0** %
Water Table Shallow: **1.0** **43.0** %
Erodibility: **Severe** **72.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **85.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **48.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**492.0** ft.	**2,481.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: **4** **1.3** %
5.3 Bank Armoring: **1,904.7** **32.0** %
Left: **146.0** ft. Right: **1,758.7** ft.
5.4 Channel Straightening: **2,086.3** **35.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: 2
6.4 Meander Migration:
6.5 Meander Width: **ft.** Ratio: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **89.1670151** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	9

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:35:40

Please update 4.3 with P2 data

Author: Jake Date: 2024-09-10 15:50:29

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:16:09

Resets to blank after updates are saved

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:47:28

Please update 6.3 with P2 data (Step 5.1)

Author: Jake Date: 2024-09-10 15:51:22

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:51:37

Set to side, not significant

Phase 2 Segment Summary Report West River

Stream: Trib 12 to West River
Reach: T12.03-0
Segment Length(ft): 5,958
Rain: Yes
Segment Version: Base

SGAT Version: 4.53
Organization:
Observers: JHB JMD
Completion Date: 10/24/2022
Qualtiy Control Status - Consultant: Provisional
Qualtiy Control Status - Staff: Provisional

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative: **The reach is highly variable with portions that were likely reference Bc. However the majority of the reach is reference C with a broad valley. Much of the reach is encroached by Thompsonville Road leading to an overall change in valley confinement to Narrow. Incision is likely historic and areas of mid channel sediment accumulation and several flood chutes were observed, suggesting that some Stage IV adjustments are occurring. We assessed the reach as Stage II due to historic incision and the lack of actual planform adjustment despite the sediment accumulation.**

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan: None
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	0		
Road:	5,958	5	
Railroad:	0		
Imp. Path:	0		
Dev.:	0		

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Hilly
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): 130
Width Determination: Measured
Confinement Type: NW
In Rock Gorge: No
Human Caused Change in Valley Width?: Yes

1.6 Grade Controls: 3

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		1.0	0.0	No	No

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 15:11:09

Should this be added as a subreach stream type to 2.15?

Author: Joe Subject: Joe Date: 2024-12-03 11:52:45

Can't do a subreach on a non-segmented reach. The Bc portions were spaced out and not worth a segment.

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:43:37

Thompsonburg

Author: Jake Date: 2024-09-10 15:54:10

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:54:15

Updated

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-07 12:51:04

Need to add additional grade control from FIT?

Author: Joe Date: 2024-12-03 13:37:31

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 13:37:27

Bad DMS error when trying to add GC

Stream: **Trib 12 to West River** Reach: **T12.03-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**27.60**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**48.00**	Boulder:	**23.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.10**	Cobble:	**33.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.08**	Fine Gravel:	**5.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.74**	Sand:	**20.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.28**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**47**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**44.0**	**45.2**	Dominant:	**Deciduous**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.3**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency: 1	**Non-cohesive**		Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**146.0**	**1,758.7**	Canopy %:	**76-100**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**							

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**492**	**2,481**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Shrubs/Sapling**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Residential**	Mass Failures		
Sub-dominant	**Residential**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:39

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:44:07

Value for right? Upper and lower.

Author: Jake Date: 2024-09-10 15:54:56

Completed set by Jake

Author: Jake Subject: Jake Date: 2024-09-10 15:55:04

Updated to Non-cohesive

Stream: Trib 12 to West River Reach: T12.03-0

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**

4.2 Adjacent Wetlands: **Minimal**

4.3 Flow Status: **Low**

4.4 # of Debris Jams: 1 **6**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.: **None**

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch:	**0**	Road Ditch:	**2**
Other:	**0**	Tile Drain:	**0**
Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Diagonal:	**3**	Mid:	**2**
Delta:		Point:	
Island:		Side:	**4**
Braiding:	**0**		

5.2 Other Features

Neck Cutoff:	**0**	Flood chutes:	**4**
Avulsion:	**0**		

5.3 Steep Riffles and Head Cuts

Head Cuts:	**0**	Steep Riffles:	**0**
Trib Rejuv.:			

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **Straightening**

Straightening Length (ft.): **2,086**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score: **0**

Habitat Rating: **0.00**

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**8**	**None**	**Yes**
7.2 Channel Aggradation	**11**	**None**	**No**
7.3 Widening Channel	**10**	**None**	**No**
7.4 Change in Planforml	**7**	**None**	**No**
Total Score	**36**		

Geomorphic Rating	**0.45**
Channel Evolution Model	**F**
Channel Evolution Stage	**II**
Geomorphic Condition	**Fair**
Stream Sensitivity	**High**

Page:40

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:17:17

Please update P1 7.3

Author: Joe Date: 2024-12-03 13:41:50

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Trib 12 to West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T12.04**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.19940**
1.3 Downstream Longitude: **-72.78892**

Step 2. Stream Type

2.1 Elevation Upstream: **1,219**
2.1 Elevation Downstream: **1,141**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,829.0** ft. **0.91** Miles
2.3 Valley Slope: **1.6**
2.4 Channel Length: **5,106.0** ft. **0.97** Miles
2.5 Channel Slope: **1.53 %**
2.6 Sinuosity: **1.06**
2.7 Watershed Area: **6.8** Square Miles
2.8 Channel Width: **30.5** feet
2.9 Valley Width: **230.0** feet
2.10 Confinement Ratio: **7.5**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Alluvial** **40.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **B** **81.0** %
Flooding: **None/Rare** **59.0** %
Water Table Deep: **3.0** **40.0** %
Water Table Shallow: **1.5** **78.0** %
Erodibility: **slight** **21.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **84.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **37.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**1,169.0** ft.	**1,407.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: **3** **6.1** %
5.3 Bank Armoring: **1,005.3** **19.7** %
Left: **511.5** ft. Right: **493.8** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,051.8** ft. **0.0** ft.
6.3 Channel Bars: 2
6.4 Meander Migration:
6.5 Meander Width: **ft.** Ratio: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **210.8727417** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	1 Low	0 N.S.	0 N.S.	0 Unk.	2 High	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	9

Page:41

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:51:21

Please update 4.3 with P2 data

Author: Jake Date: 2024-09-10 16:01:24

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:20:00

Resets to blank after saving updated values

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:47:36

Please update 6.3 with P2 data (Step 5.1)

Author: Joe Date: 2024-12-03 13:51:20

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **Trib 12 to West River**
Reach: **T12.04-0**
Segment Length(ft): **5,106**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/2/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Thompsonburg Road from Mansfield Lane to Fieldstone Way**

Step 5 - Notes:

Step 7 - Narrative: **The reach is variable with areas of naturally or human caused confinement. Encroachment from thomsonsburg road increases incision in some locations. Overall the reach has scattered areas of widening and planform adjustment but this is limited due to coarse native substrate and areas of historic bank armoring. We assessed the reach as Stage II due to historic incision and limited evidence of widening or planform adjustment. The reach is showing active aggradation and may be transitioning to stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation: **None**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0			
Road:	2,485	5		
Railroad:	0			
Imp. Path:	0			
Dev.:	1,052			

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **230**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Stream: **Trib 12 to West River** Reach: **T12.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**25.50**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**160**	**mm**
2.3 Mean Depth (tf):	**2.13**	Bedrock:	**0.0 %**	Bar:	**120**	**mm**
2.4 Floodprone Width (ft.):	**55.00**	Boulder:	**12.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**44.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**21.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.97**	Fine Gravel:	**13.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.16**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.50**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**40**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**48.1**	**162.7**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**1.9**	**2.5**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**511.5**	**493.8**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,169**	**1,407**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Deciduous**
Sub-Dominant	**Deciduous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay** 1	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:43

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:29:45

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-09-10 16:03:34

Completed set by Jake

Phase 2 Segment Summary Report — West River

Stream: **Trib 12 to West River** Reach: **T12.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **21**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Mid: **5**
Point: **1**
Side: **10**
Diagonal:
Delta:
Island:
Braiding: **0**

5.2 Other Features
Flood chutes: **2**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type: **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**11**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**Yes**
7.3 Widening Channel	**12**	**None**	**No**
7.4 Change in Planforml	**10**	**None**	**No**
Total Score	**45**		

Geomorphic Rating: **0.56**
Channel Evolution Model: **F**
Channel Evolution Stage: **II**
Geomorphic Condition: **Fair**
Stream Sensitivity: **High**

Page:44

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:17:31

Please update P1 7.3

Author: Joe Date: 2024-12-03 13:52:17

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R19**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.18510**
1.3 Downstream Longitude: **-72.80331**

Step 2. Stream Type

2.1 Elevation Upstream: **1,078**
2.1 Elevation Downstream: **1,004**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **12,250.0** ft. **2.32** Miles
2.3 Valley Slope: **0.6**
2.4 Channel Length: **13,961.0** ft. **2.64** Miles
2.5 Channel Slope: **0.53 %**
2.6 Sinuosity: **1.14**
2.7 Watershed Area: **88.1** Square Miles
2.8 Channel Width: **94.0** feet
2.9 Valley Width: **788.0** feet
2.10 Confinement Ratio: **8.4**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **59.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **C** **60.0** %
Flooding: **None/Rare** **63.0** %
Water Table Deep: **6.0** **35.0** %
Water Table Shallow: **1.5** **36.0** %
Erodibility: **Severe** **62.0** %
7.4 Comments: 1

Banks heights of 2 to > 15 ft. observed, but no erosion.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **37.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**>100**
Sub-dominant:	**>100**	**26-50**
Length w / less than 25 ft.:	**3,530.0** ft.	**2,515.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **4** **12.6** %
5.3 Bank Armoring: **5,462.3** **39.1** %
Left: **3,472.7** ft. Right: **1,989.7** ft.
5.4 Channel Straightening: **4,120.4** **29.5** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,604.9** ft. **18.7**

	One Side	Both Sides
Road:	**2,604.9** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,349.0** ft. **5,307.2** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Migration**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **1025.4622803** ft
7.2 Bank Height: **6** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	2 High	0 N.S.	1 Low	2 High	1 Low	1 Low	0 N.D.	0 N.D.	1 Low	1 Low	17

Page:45

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 15:22:58

Please include a note describing segmenting that happened in Phase 2

Author: Joe Date: 2024-12-03 14:20:18

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-A**
Segment Length(ft): **1,710**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts at the confluence with T12 and continues upstream through a near continuous grade control. Segment break is located at the top of the long grade control.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is historically straightened and is deeply incised and entrenched due to the elevated roadway on the left bank. Bedrock grade controls were observed through most of the reach, there is no opportunity for further incision or widening.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Grade Controls**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	0		0	
Road:	228	10	1,482	12
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		749	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Always	Always
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **237**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Stream: **West River** Reach: **R19-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**117.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**600**	**mm**
2.3 Mean Depth (tf):	**2.37**	Bedrock:	**0.0 %**	Bar:	**10**	**mm**
2.4 Floodprone Width (ft.):	**130.00**	Boulder:	**50.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**28.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**10.0 %**	Bed Material:	**Boulder**	
2.6 Width/Depth Ratio:	**49.37**	Fine Gravel:	**4.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.11**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type:	**Mix**	**Mix**
Consistency:	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**
Consistency:	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft.):	**0.0**	**0.0**
Erosion Height (ft.):	**0.0**	**0.0**
Revetment Type:	**Rip-Rap**	**None**
Revetment Length:	**1,333.4**	**0.0**

Near Bank Vegetation Type	Left	Right
Dominant:	**Herbaceous**	**Deciduous**
Sub-dominant:	**Deciduous**	**Herbaceous**
Bank Canopy		
Canopy %:	**26-50**	**26-50**
Mid-Channel Canopy:	**Open**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**738**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Industrial**	**Forest**
Sub-dominant	**Residential**	**Residential**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R19-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs:	**None**
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,401**
Side: **1**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**Yes**	Geomorphic Rating	**0.35**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**5**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**28**			Stream Sensitivity	**High**

Page:48

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-07 13:19:13

There are 3 mapped stormwater inputs in the FIT for this segment. None in DMS. Does this need to be reloaded?

Author: Joe Date: 2024-12-03 14:27:59

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 14:28:11

DMS isn't letting me upload them...

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-B**
Segment Length(ft): **3,205**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts above the long grade control and continues to the segment break upstream of the Route 100 bridge where the valley width increases.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is pinned between two roads with elevated fill along both banks. No opportunity for widening or planform adjustment and limited opportunity for additional incision due to grade control**

Step 1. Valley and Floodplain

1.1 Segmentation: 2

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:			0	
Road:			3,205	12
Railroad:			0	
Imp. Path:			0	
Dev.:			3,205	

1.4 Adjacent Side Left Right 1

Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features

Valley Width (ft): **110**
Width Determination: **Measured**
Confinement Type: **NC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 12:53:51

Data not entered for 1.4

Author: Jake Date: 2024-10-02 14:33:15

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:06:05

Please add segmentation reason

Author: Joe Date: 2024-12-03 14:34:48

Completed set by Joe

Stream: **West River** Reach: **R19-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**81.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.90**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**3.49**	Bedrock:	**70.0 %**	Bar:	**10**	**mm**
2.4 Floodprone Width (ft.):	**95.00**	Boulder:	**10.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**16.00**	Cobble:	**0.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**0.0 %**	Bed Material:	**Bedrock** 1	
2.6 Width/Depth Ratio:	**23.21**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.17**	Sand:	**10.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**3.27**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**0**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Multiple**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**2,042.7**	**1,224.9**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**2,253**	**1,509**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Residential**	Mass Failures		
Sub-dominant	**Residential**	**Commercial**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:50

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-23 10:32:12

Can you confirm this is the correct pebble count for R19B? Asking because of the mention of continuous grade control in R19A.

Author: Joe Subject: Joe Date: 2024-12-03 14:48:53

A pebble count was collected near the bottom of the segment before the grade controls. B was more in the middle in an area with grade controls.

Stream: **West River** Reach: **R19-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	1		
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**2**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**2,719**
Side:	**4**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Page:51

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-07 13:18:46

Seeing 4 in DMS and FIT. Might be a report issue that only two are shown here.

Author: Joe Date: 2024-12-03 14:49:45

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 14:49:42

DMS is not showing road ditches

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R19-C**
Segment Length(ft): **9,046**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Segment starts upstream of the Route 100 bridge and continues north through the wider valley to the upstream reach break where the valley naturally returns to a confined setting.**

Step 5 - Notes:

Step 7 - Narrative: **Large cobble bars were observed throughout the segment along with numerous areas of erosion indicating that the reach is widening and aggrading coarse sediment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Valley Width**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	321		15	1,352	19
Railroad:	0			0	
Imp. Path:	0			0	
Dev.:	1,349			1,353	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **839**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		4.0	2.0	No	No

Stream: **West River** Reach: **R19-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**91.00**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.40**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**186.00**	Boulder:	**16.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.40**	Cobble:	**42.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**36.55**	Fine Gravel:	**11.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.04**	Sand:	**2.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.29**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**6.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**14**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**595.8**	**429.7**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**6.4**	**7.2**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**96.5**	**764.8**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**538**	**1,006**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Hay**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**16.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R19-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**5**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**		
Mid:	**3**	Delta:	Flood chutes:	**6**	Avulsion:	**1**	5.5 Straightening:	**None**	
Point:	**1**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**	
Side:	**23**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**14**	**None**	**No**	Geomorphic Rating	**0.50**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**40**			Stream Sensitivity	**High**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R20**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.21071**
1.3 Downstream Longitude: **-72.82354**

Step 2. Stream Type

2.1 Elevation Upstream: **1,108**
2.1 Elevation Downstream: **1,078**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **5,949.0** ft. **1.13** Miles
2.3 Valley Slope: **0.5**
2.4 Channel Length: **6,024.0** ft. **1.14** Miles
2.5 Channel Slope: **0.50 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **70.0** Square Miles
2.8 Channel Width: **85.0** feet
2.9 Valley Width: **331.0** feet
2.10 Confinement Ratio: **3.9**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **59.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **C** **49.0** %
Flooding: **None/Rare** **63.0** %
Water Table Deep: **6.0** **49.0** %
Water Table Shallow: **6.0** **49.0** %
Erodibility: **Severe** **62.0** %
7.4 Comments:
Bank heights of 2 to > 15 ft. observed but no erosion.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **59.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**51-100**	**26-50**
Length w / less than 25 ft.:	**0.0** ft.	**5,846.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **17.0** %
5.3 Bank Armoring: **4,300.3** **71.4** %
Left: **89.0** ft. Right: **4,211.3** ft.
5.4 Channel Straightening: **5,812.3** **96.5** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **6,023.7** ft. **100.0**

	One Side	Both Sides
Road:	**6,023.7** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **760.6** ft. **0.0** ft.
6.3 Channel Bars: **Point**
6.4 Meander Migration: **None**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **No Data** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	2 High	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	13

Phase 2 Segment Summary Report West River

Stream: West River
Reach: R20-01
Segment Length(ft): 6,024
Rain: No
Segment Version: Base

SGAT Version: 4.53
Organization:
Observers: JHB, EHB
Completion Date: 8/9/2022
Qualtiy Control Status - Consultant: Provisional
Qualtiy Control Status - Staff: Provisional

Step 0 - Location: **From Londonderry Village Market to VT 100 bridge.**

Step 5 - Notes:

Step 7 - Narrative: **The reach is extensively straightened along Route 100 and is pinned against the left valley wall. Historically the reach likely had some sinuousity and small flood benches. The reach is stuck in Stage II with no opportunity for widening or planform adjustment. Incision is unlikely due to coarse bed material.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	0		
Road:	6,024	10	
Railroad:	0		
Imp. Path:	0		
Dev.:	761		

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Always	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft): 142
Width Determination: Measured
Confinement Type: NC
In Rock Gorge: No
Human Caused Change in Valley Width?: Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Page:56

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:14:24

Are there no valley walls for R20? Not seeing in GDB.

Author: Jake Subject: Jake Date: 2024-09-10 16:05:42

@Joe VW in previously mentioned GIS layer

Stream: **West River** Reach: **R20-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**91.00**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**4.00**	2.12 Substrate Composition		Bed:	**400 mm**
2.3 Mean Depth (tf):	**2.55**	Bedrock:	**0.0 %**	Bar:	**200 mm**
2.4 Floodprone Width (ft.):	**110.00**	Boulder:	**21.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**11.20**	Cobble:	**46.0 %**	Stream Type:	**F**
Human Elev FloodPln (ft.):		Coarse Gravel:	**21.0 %**	Bed Material:	**Cobble**
2.6 Width/Depth Ratio:	**35.69**	Fine Gravel:	**4.0 %**	Subclass Slope:	
2.7 Entrenchment Ratio:	**1.21**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**
2.8 Incision Ratio:	**2.80**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**2**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**89.0**	**4,211.3**	Canopy %:	**26-50**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**None** 1	**26-50**
W less than 25	**0**	**5,846**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Herbaceous**
Sub-Dominant	**None**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Commercial**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Page:57

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:27:37

Should P1 4.3 be updated?

Author: Jake Date: 2024-09-10 16:06:43

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:35:53

Value reverts to original when saved after updating

Stream: **West River** Reach: **R20-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **None**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch:	**0**	Road Ditch:	**6**
Other:	**0**	Tile Drain:	**0**
Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**

4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid:
Delta:
Point:
Island:
Side: 1 **4**
Braiding: **0**

5.2 Other Features
Flood chutes: **0**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**

Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **Straightening**
Straightening Length (ft.): **5,812**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**Yes**	Geomorphic Rating	**0.34**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**27**			Stream Sensitivity	**Extreme**

Page:58

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:30:23

Should P1 6.3 be updated?

Author: Joe Date: 2024-12-03 15:07:22

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R21**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.22600**
1.3 Downstream Longitude: **-72.81710**

Step 2. Stream Type

2.1 Elevation Upstream: **1,136**
2.1 Elevation Downstream: **1,108**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,175.0** ft. **0.60** Miles
2.3 Valley Slope: **0.9**
2.4 Channel Length: **3,191.0** ft. **0.60** Miles
2.5 Channel Slope: **0.88 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **68.4** Square Miles
2.8 Channel Width: **84.1** feet
2.9 Valley Width: **711.0** feet
2.10 Confinement Ratio: **8.5**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **48.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **69.0** %
Flooding: **None/Rare** **57.0** %
Water Table Deep: **6.0** **78.0** %
Water Table Shallow: **6.0** **78.0** %
Erodibility: **Severe** **57.0** %
7.4 Comments:
Williams Dam likely impacts this reach. Bank heights of 2 to 8 ft. observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **47.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**26-50**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**827.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **807.6** **25.3** %
Left: **384.0** ft. Right: **423.6** ft.
5.4 Channel Straightening: **110.3** **3.5** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,546.2** ft. **79.8**

	One Side	Both Sides
Road:	**2,546.2** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **2,520.2** ft. **653.6** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **73 ft.** Ratio: **0.9**
6.6 Wavelength: **589 ft.** Ratio: **7.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **566.5198364** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Bend**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	2 High	1 Low	1 Low	1 Low	16

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R21-0**
Segment Length(ft): **3,191**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, EHB**
Completion Date: **8/9/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From VT11 bridge to Londonderry Village Market.**

Step 5 - Notes:

Step 7 - Narrative: **Channel is pinned against the left valley wall for most of the length and is encroached by development along most fo the right bank, leading to a change in valley confinment. The channel is incised and the right floodplain is fully developed. Upstream dam is interupting sediment transport and likely contributing to incision. The reach is stuck in Stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	**83**	**2**	**0**	
Road:	**2,546**	**6**	**642**	**15**
Railroad:	**0**		**0**	
Imp. Path:	**0**		**0**	
Dev.:	**2,520**		**654**	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Very Steep**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **374**
Width Determination: **Measured**
Confinement Type: **NW**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls: 1

Page:60

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:38:40

Are DSCN1173 and 1174 look like they might be showing a grade control. Seem to recollect this feature around here 72.8087314°W 43.2264988°N. Should this be added to FIT?

Author: Joe Date: 2024-12-03 15:09:20

Completed set by Joe

Stream: **West River** Reach: **R21-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**82.90**	2.11 Riffle/Step Spacing:	**450 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.10**	2.12 Substrate Composition		Bed:	**240**	**mm**
2.3 Mean Depth (tf):	**2.86**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**175.00**	Boulder:	**18.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.40**	Cobble:	**46.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**28.99**	Fine Gravel:	**7.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.11**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.80**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**2**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**69.3**	**497.2**	Dominant:	**Coniferous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.0**	**3.3**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**384.0**	**423.6**	Canopy %:	**51-75**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**0**	**827**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Herbaceous**
Sub-Dominant	**None**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Commercial**	Mass Failures		
Sub-dominant	**Hay**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**17.5**	Gullies Length	**0**	
Gullies	**None**				

Stream: West River Reach: R21-0

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	Minimal	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	None	Flow Reg. Use:		Field Ditch:	0	Road Ditch:	1
4.3 Flow Status:	Low	Impoundments:		Other:	0	Tile Drain:	0
4.4 # of Debris Jams:	1	Impoundment Loc.:		Overland Flow:	0	Urb Strm Wtr Pipe:	0
		4.6 Up/Down Strm flow reg.:	Up Stream	4.9 # of Beaver Dams:		0	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		0	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	0	5.4 Stream Ford or Animal Crossing:	No
Mid:	Delta:	Flood chutes:	0	Avulsion:	0	5.5 Straightening:	Straightening
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	0	Straightening Length (ft.):	110
Side: 51	Braiding: 0	Steep Riffles:	0	Trib Rejuv.:	No	5.5 Dredging:	None

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	0	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	0.00				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Confined	Score	STD	Historic		
7.1 Channel Degradation		3	B to F2	Yes	Geomorphic Rating	0.31
7.2 Channel Aggradation		9	None	No	Channel Evolution Model	F
7.3 Widening Channel		63	None	No	Channel Evolution Stage	II
7.4 Change in Planforml		7	None	No	Geomorphic Condition	Poor
Total Score		25			Stream Sensitivity	Extreme

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 16:11:11

Should P1 6.3 be updated?

Author: Joe Date: 2024-12-03 15:15:11

Completed set by Joe

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:51:59

B to F departure noted.
Should there be a departure when stream type is noted as C? Or a historic C to F departure?

Score of 3 seems low for only having one poor and the rest fair and good in 7.1. Selection of poor for row 2 doesn't seem to align with the IR and ER values in step 2.

Author: Joe Date: 2024-12-03 15:18:13

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 15:18:10

Agreed, I must have been grumpy. Updated scores and changed departure to C-F

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 15:56:13

Selection of poor in 7.3 doesn't seem to align with IR and ER values in step 2.

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R22**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.22645**
1.3 Downstream Longitude: **-72.80735**

Step 2. Stream Type

2.1 Elevation Upstream: **1,160**
2.1 Elevation Downstream: **1,136**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,145.0** ft. **0.79** Miles
2.3 Valley Slope: **0.6**
2.4 Channel Length: **5,499.0** ft. **1.04** Miles
2.5 Channel Slope: **0.44 %**
2.6 Sinuosity: **1.33**
2.7 Watershed Area: **40.6** Square Miles
2.8 Channel Width: **66.9** feet
2.9 Valley Width: **992.0** feet
2.10 Confinement Ratio: **14.8**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **54.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **A** **47.0** %
Flooding: **None/Rare** **76.0** %
Water Table Deep: **6.0** **54.0** %
Water Table Shallow: **6.0** **54.0** %
Erodibility: **Severe** **55.0** %
7.4 Comments: 3

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **34.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**0.0** ft.	**676.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **592.5** **10.8** %
Left: **0.0** ft. Right: **592.5** ft.
5.4 Channel Straightening: **681.2** **12.4** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,564.5** ft. **46.6**

	One Side	Both Sides
Road:	**2,564.5** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **652.2** ft. **167.9** ft.
6.3 Channel Bars: 2
6.4 Meander Migration:
6.5 Meander Width: **ft.** Ratio: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **171.3650360** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	0 N.S.	1 Low	1 Low	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	9

Page:63

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 16:33:50

Please update with step 3.2 data from phase 2

Author: Jake Date: 2024-09-10 16:10:37

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 14:41:49

Values reset to bank after saving update

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 16:33:26

Please update with step 5 data from phase 2

Author: Joe Date: 2024-12-03 15:20:48

Completed set by Joe

Author: Jake Subject: Jake Date: 2024-09-10 16:11:22

Check with Joe about how to update this

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-26 16:12:18

Please include a note describing segmenting that happened in phase 2.

Author: Joe Date: 2024-12-03 15:21:00

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R22-A**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers:
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **impounded**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation: 1

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	1,355	7		1,054	4
Railroad:	0			0	
Imp. Path:	0			0	
Dev.:	299			1,159	

1.4 Adjacent Side Left Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Dam	**Mid-Segment**	**20.0**	**30.0**	**No**	**No**

Page:64

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:06:24

Please add segmentation reason

Author: Joe Date: 2024-12-03 15:21:15

Completed set by Joe

Stream: **West River** Reach: **R22-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):		2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):		2.12 Substrate Composition		Bed:	
2.3 Mean Depth (tf):		Bedrock:	%	Bar:	
2.4 Floodprone Width (ft.):		Boulder:	%	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):		Cobble:	%	Stream Type:	
Human Elev FloodPln (ft.):		Coarse Gravel:	%	Bed Material:	
2.6 Width/Depth Ratio:	**0.00**	Fine Gravel:	%	Subclass Slope:	
2.7 Entrenchment Ratio:	**0.00**	Sand:	%	Bed Form:	
2.8 Incision Ratio:	**0.00**	Silt and Smaller:	%	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type	
2.9 Sinuosity:		Detritus:	%	Reference Stream Type:	
2.10 Riffles Type:		# Large Woody Debris:		Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope:

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**99.1**	**330.0**	Dominant:		
Material Type:			Erosion Height (ft.):	**4.0**	**3.9**	Sub-dominant:		
Consistency:			Revetment Type:	**Rip-Rap**	**Other**	Bank Canopy		
Lower			Revetment Length:	**226.4**	**92.3**	Canopy %:		
Material Type:						Mid-Channel Canopy:		
Consistency:								

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25	**1,341**	**114**
Buffer Vegitation Type		
Dominant		
Sub-Dominant		

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant		
Sub-dominant		
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**One**	**3.0**

	Left	Right
Mass Failures		
Height		
Gullies Number	**1**	
Gullies Length	**50**	

Stream: **West River** Reach: **R22-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.:

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs

Field Ditch: **0** Road Ditch: **1**

Other: **0** Tile Drain: **0**

Overland Flow: **0** Urb Strm Wtr Pipe: **0**

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Diagonal:

Mid:

Delta:

Point:

Island:

Side:

Braiding: **0**

5.2 Other Features

Flood chutes: **0**

5.3 Steep Riffles and Head Cuts

Steep Riffles: **0**

Neck Cutoff: **0**

Avulsion: **0**

Head Cuts: **0**

Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **None**

Straightening Length (ft.): **0**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating

Channel Evolution Model

Channel Evolution Stage

Geomorphic Condition

Stream Sensitivity

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R22-B**
Segment Length(ft): **1,210**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **10/19/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT100**

Step 5 - Notes:

Step 7 - Narrative: **Route 100 is a major encroachment on the channel and has pinned the river against the left valley wall. The channel is incised with no floodplain access due to Route 100. The channel has no opportunity for widening or planform and therefore stuck in stage II. The downstream dam affects sediment transport and has reduced the channel slope.**

Step 1. Valley and Floodplain

1.1 Segmentation: 1

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	1,210	10		0	
Railroad:	0			0	
Imp. Path:	0			0	
Dev.:	652			168	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft):	**251**
Width Determination:	**Measured**
Confinement Type:	**SC**
In Rock Gorge:	**No**

Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Page:67

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:06:34

Please add segmentation reason

Author: Joe Date: 2024-12-03 15:22:40

Completed set by Joe

Stream: **West River** Reach: **R22-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**54.70**	2.11 Riffle/Step Spacing:	**550 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.35**	2.12 Substrate Composition		Bed:	**100**	**mm**
2.3 Mean Depth (tf):	**2.49**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**12.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**59.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**21.97**	Fine Gravel:	**6.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.37**	Sand:	**21.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.09**	Silt and Smaller:	**2.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**171.4**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.0**	**0.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**592.5**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**0**	**676**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Herbaceous**
Sub-Dominant	**None**	**Invasives**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R22-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**681**
Side: **2**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**C to F**	**Yes**	Geomorphic Rating	**0.43**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**34**			Stream Sensitivity	**Extreme**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R23**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.23428**
1.3 Downstream Longitude: **-72.79797**

Step 2. Stream Type

2.1 Elevation Upstream: **1,170**
2.1 Elevation Downstream: **1,160**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,577.0** ft. **0.87** Miles
2.3 Valley Slope: **0.2**
2.4 Channel Length: **5,084.0** ft. **0.96** Miles
2.5 Channel Slope: **0.20 %**
2.6 Sinuosity: **1.11**
2.7 Watershed Area: **39.3** Square Miles
2.8 Channel Width: **65.9** feet
2.9 Valley Width: **596.0** feet
2.10 Confinement Ratio: **9.0**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Alluvial** **58.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **C** **50.0** %
Flooding: **Frequent** **58.0** %
Water Table Deep: **1.5** **49.0** %
Water Table Shallow: **0.0** **49.0** %
Erodibility: **Moderate** **41.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **89.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **57.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**0-25**
Length w / less than 25 ft.:	**108.0** ft.	**413.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **38.1** %
5.3 Bank Armoring: **560.0** **11.0** %
Left: **115.5** ft. Right: **444.5** ft.
5.4 Channel Straightening: **476.7** **9.4** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,422.7** ft. **28.0**

	One Side	Both Sides
Road:	**1,247.7** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	**1,422.7** ft.	ft.

6.2 Development: **0.0** ft. **66.5** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Migration**
6.5 Meander Width: **157 ft.** Rato: **2.4**
6.6 Wavelength: **566 ft.** Ratio: **8.6**

Step 7. Windshield Survey

7.1 Bank Erosion: **617.6961670** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Bend**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	2 High	1 Low	1 Low	0 N.S.	2 High	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	1 Low	1 Low	15

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R23-0**
Segment Length(ft): **5,084**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT100**

Step 5 - Notes:

Step 7 - Narrative: **Channel is incised with signs of active widening and planform adjustment as increased sediment (gravel) works through the reach.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	766	10		274	10
Railroad:	0			0	
Imp. Path:	1,181	18		0	
Dev.:	0			67	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft): **425**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		0.0	0.0	No	No

Stream: **West River** Reach: **R23-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**71.30**	2.11 Riffle/Step Spacing:	**650 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.50**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.71**	Bedrock:	**0.0 %**	Bar:	**50**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**3.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.90**	Cobble:	**9.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**44.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**26.31**	Fine Gravel:	**25.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.12**	Sand:	**17.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.26**	Silt and Smaller:	**2.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**12**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**470.7**	**147.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.8**	**6.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**115.5**	**444.5**	Canopy %:	**51-75**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**108**	**413**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	1Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**Multiple**	**20.0**	Gullies Length	**100**	
Gullies	**One**	**4.0**			

Page:72

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:29:50

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-10-02 14:43:34

Completed set by Jake

Stream: **West River** Reach: **R23-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Abundant** 1

4.2 Adjacent Wetlands: **Abundant**

4.3 Flow Status: **Low**

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.: **None**

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**

Field Ditch: Road Ditch:

Other: Tile Drain:

Overland Flow: Urb Strm Wtr Pipe:

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal: **4** Mid: **4** Delta: Point: Island: Side: **8** Braiding: **0**

5.2 Other Features Neck Cutoff: **0** Flood chutes: **2** Avulsion: **0**

5.3 Steep Riffles and Head Cuts Head Cuts: **0** Steep Riffles: **1** Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **Straightening** Straightening Length (ft.): **477**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score: **0**

Habitat Rating: **0.00**

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**C to F**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**Extreme**

Page:73

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:43:06

Should P1 4.4 be updated?

Author: Jake Date: 2024-10-02 14:44:03

Completed set by Jake

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **LONDONDERRY, WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R24**
SGAT Version: **4.53**
Date Last Edited: **May, 28 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry, Weston**
1.3 Downstream Latitude: **43.24311**
1.3 Downstream Longitude: **-72.78782**

Step 2. Stream Type

2.1 Elevation Upstream: **1,174**
2.1 Elevation Downstream: **1,170**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,937.0** ft. **0.94** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **7,973.0** ft. **1.51** Miles
2.5 Channel Slope: **0.05 %**
2.6 Sinuosity: **1.61**
2.7 Watershed Area: **37.9** Square Miles
2.8 Channel Width: **64.9** feet
2.9 Valley Width: **2,415.0** feet
2.10 Confinement Ratio: **37.2**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **77.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **C** **46.0** %
Flooding: **Frequent** **45.0** %
Water Table Deep: **1.5** **44.0** %
Water Table Shallow: **0.0** **44.0** %
Erodibility: **slight** **21.0** %
7.4 Comments: 3

Bank heights of 2 to > 15 ft. observed. Japanese knotweed on banks.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **28.0** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**>100**
Sub-dominant:	**>100**	**26-50**
Length w / less than 25 ft.:	**2,451.0** ft.	**173.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **21.8** %
5.3 Bank Armoring: **561.7** **7.0** %
Left: **369.6** ft. Right: **192.1** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,193.2** ft. **15.0**

	One Side	Both Sides
Road:	**1,193.2** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,510.0** ft. **0.0** ft.
6.3 Channel Bars: **Point** 2
6.4 Meander Migration: **Migration**
6.5 Meander Width: **205 ft.** Ratio: **3.2**
6.6 Wavelength: **623 ft.** Ratio: **9.6**

Step 7. Windshield Survey

7.1 Bank Erosion: **1816.3470459** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	1 Low	1 Low	2 High	1 Low	1 Low	0 N.S.	2 High	1 Low	17

Page:74

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:16:38

Do you think this is overly wide for reference? It looks like the only point where the valley might approach this width on the reach is where the trib comes in.

Author: Joe Date: 2024-12-03 15:39:19

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 15:39:15

reduced to 1400 based on several measurements

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:10:26

Please update (P2 5.1)

Author: Joe Date: 2024-12-03 16:08:15

Completed set by Joe

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 11:11:41

Please include a note about the segmentation that occurred in phase 2.

Author: Joe Date: 2024-12-03 16:29:15

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R24-A**
Segment Length(ft): **3,039**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Between VT100 and Boynton Road**

Step 5 - Notes:

Step 7 - Narrative: **Channel has active widening, aggradation, and planform adjustment processes. The floodplain is elevated but incision is generally <2. Review of historic imagery shows several areas of migration, which is ongoing.**

Step 1. Valley and Floodplain

1.1 Segmentation: None 1

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:					
Road:					
Railroad:					
Imp. Path:					
Dev.:					

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft): **1,306**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Page:75

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 11:11:18

Please update to reflect segmentation.

Author: Joe Date: 2024-12-03 16:29:36

Completed set by Joe

Stream: **West River** Reach: **R24-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**64.00**	2.11 Riffle/Step Spacing:	**550 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**140**	**mm**
2.3 Mean Depth (tf):	**1.62**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**140.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.20**	Cobble:	**26.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**34.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**39.51**	Fine Gravel:	**28.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.19**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.73**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Oxbows**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**9**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**698.1**	**202.5**	Dominant:	**Herbaceous**	**Invasives**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.5**	**3.9**	Sub-dominant:	**Invasives**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**0**	**0**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**26-50** 2	**0-25**
W less than 25	**1,100**	**173**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Invasives**
Sub-Dominant	**Invasives**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant 1	**Hay**	**Shrubs/Sapling**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:76

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:29:55

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-10-02 14:46:10

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 14:20:05

Should P1 4.3 be updated? Considering both segments, is 26-50 or 51-100 sub-dominant for the left bank?

Author: Jake Subject: Jake Date: 2024-10-02 14:47:14

Values reset to original value after saving updates

Stream: **West River** Reach: **R24-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**1**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**60**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**3**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**4**	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:		**None**
Point:	**4**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**0**
Side:	**9**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.40**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**6**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**32**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R24-B**
Segment Length(ft): **4,394**
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB,1JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From VT100 bridge to between VT100 and Boynton Road**

Step 5 - Notes:

Step 7 - Narrative: **The segment is moderately incised with a large floodplain available on one or both banks throughout. We did not observe many areas of active widening, partially slowed by historic bank armoring. The channel had increased sediment load with numerous mid channel bars and partially filled riffles. We assessed the reach as early stage III with aggradation being the dominant process.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		**0**			
Road:		**737**	**8**		
Railroad:		**0**			
Imp. Path:		**0**			
Dev.:		**1,510**			

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Hilly**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft):	**1,528**
Width Determination:	**Measured**
Confinement Type:	**VB**
In Rock Gorge:	**No**

Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Page:78

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:56:41

Looks like JHB in the pictures

Author: Jake Date: 2024-10-02 15:01:11

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 13:58:38

Please update segmentation reason

Stream: **West River** Reach: **R24-B**

Step 2. Stream Channel

2.1 Bankfull Width (ft.):	**80.60**	2.11 Riffle/Step Spacing:	**700 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**1.59**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**1,100.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.30**	Cobble:	**45.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**31.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**50.69**	Fine Gravel:	**12.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**13.65**	Sand:	**7.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.77**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity: 2		Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**10**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: 3

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**556.1**	**359.6**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.0**	**2.8**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**369.6**	**192.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**1,350**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Pasture**	**Residential**
Sub-dominant	**Forest**	**Forest**
(Legacy)	Amount	Mean Hieght
Failures	**Multiple**	**20.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Page:79

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 14:11:05

The cross section location does not appear to be in the FIT data.

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 14:13:09

Value?

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:08:07

Value?

Stream: **West River** Reach: **R24-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**4**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**None**
Point:	**3**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**0**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**1	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**Very High**

Page:80

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 14:53:09

Should planform score be higher, with all answers in the good and reference categories?

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R25**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Weston**
1.3 Downstream Latitude: **43.25574**
1.3 Downstream Longitude: **-72.79147**

Step 2. Stream Type

2.1 Elevation Upstream: **1,280**
2.1 Elevation Downstream: **1,174**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **13,399.0** ft. **2.54** Miles
2.3 Valley Slope: **0.8**
2.4 Channel Length: **14,837.0** ft. **2.81** Miles
2.5 Channel Slope: **0.71 %**
2.6 Sinuosity: **1.11**
2.7 Watershed Area: **32.9** Square Miles
2.8 Channel Width: **60.9** feet
2.9 Valley Width: **765.0** feet
2.10 Confinement Ratio: **12.6**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **B** 1
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Alluvial** **54.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **B** **50.0** %
Flooding: **None/Rare** **45.0** %
Water Table Deep: **1.5** **29.0** %
Water Table Shallow: **1.5** **39.0** %
Erodibility: **slight** **22.0** %
7.4 Comments: 3

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **89.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **66.0** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**0-25**
Length w / less than 25 ft.:	**3,140.0** ft.	**1,506.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **0.7** %
5.3 Bank Armoring: **308.2** **2.1** %
Left: **99.2** ft. Right: **209.1** ft.
5.4 Channel Straightening: **4,160.0** **28.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **734.9** ft. **5.0**

	One Side	Both Sides
Road:	**688.3** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	**734.9** ft.	ft.

6.2 Development: **828.4** ft. **0.0** ft.
6.3 Channel Bars: **Point** 2
6.4 Meander Migration: **No Data**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **966.4346924** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	1 Low	1 Low	0 N.S.	0 N.D.	0 N.D.	1 Low	0 N.S.	9

Page:81

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:32:53

Should reference stream type be C given the very broad valley and most of the length in the segments having a C subreach reference?

Author: Joe Subject: Joe Date: 2024-12-03 16:34:44

agreed, changed to C

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:46:08

Should this be updated given P2 observations (5.1)?

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:04:06

Please add note about segmentation that occurred in Phase 2

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-A**
Segment Length(ft): **2,935**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **9/23/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From between Highland View Road and VT 100 to VT 100 bridge**

Step 5 - Notes:

Step 7 - Narrative: **The reach is incised leading to a departure to F type. Incision is likely due to historic straightening. Minimal evidence of widening or aggradation.**

Step 1. Valley and Floodplain

1.1 Segmentation: 1

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0				
Road:	0				
Railroad:	0				
Imp. Path:	958	8			
Dev.:	0				

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	1,121
Width Determination:	Measured
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Page:82

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:04:29

Please update segmentation reason

Stream: **West River** Reach: **R25-A**

Step 2. Stream Channel

2.1 Bankfull Width (ft.):	**68.30**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition			Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.16**	Bedrock:	**0.0 %**		Bar:	**160**	**mm**
2.4 Floodprone Width (ft.):	**90.00**	Boulder:	**1.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**57.0 %**	Stream Type:	**F**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**27.0 %**	Bed Material:	**Cobble**		
2.6 Width/Depth Ratio:	**31.62**	Fine Gravel:	**4.0 %**	Subclass Slope:			
2.7 Entrenchment Ratio:	**1.32**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:	**C**		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:		Reference Bed Material:	**Cobble**		
				Reference Subclass Slope:			
				Reference Bedform:	**Riffle-Pool**		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**80.3**	**26.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.0**	**6.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**62.7**	**209.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**0**	**955**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Hay**	**Hay**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:01:02

Please add FIT point for cross section. Should be in this vicinity 72.7934050°W 43.2563866°N

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R25-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal: **1**	5.2 Other Features	Neck Cutoff: **0**	5.4 Stream Ford or Animal Crossing:	**Yes**		
Mid:	Delta:	Flood chutes: **0**	Avulsion: **0**	5.5 Straightening:	**None** 1		
Point:	Island:	5.3 Steep Riffles and Head Cuts	Head Cuts: **0**	Straightening Length (ft.):	**0**		
Side: **6**	Braiding: **0**	Steep Riffles: **0**	Trib Rejuv.:	5.5 Dredging:	**None**		

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to F**	**Yes**	Geomorphic Rating	**0.47**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**38**			Stream Sensitivity	**Extreme**

Page:84

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:12:27

Description notes historic straightening. Should this be added to FIT?

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-B**
Segment Length(ft): **3,321**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **9/23/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Between Highland View Road/Summit Trail Road to VT 100**

Step 5 - Notes:

Step 7 - Narrative: **Aggradation is the dominant process within this segment. The channel is overwidened in many places with large mid channel and diagonal bars. Active bank erosion is limited, suggesting that the channel is not actively adjusting planform.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Valley Width**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:					
Road:					
Railroad:					
Imp. Path:					
Dev.:					

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Steep**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **1,093**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Page:85

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 08:56:46

Suggest 'Valley parallel to Highland View Rd/Summit Trail Rd... (west) and VT 100 (east)' or something to indicate it is not intersection to intersection

Author: Jake Date: 2024-10-02 15:04:36

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:59:09

Consider noting in step 7 notes or 1.1 comment. More floodplain access than segment A. Adjacent wetlands with multiple channels vs. the single thread channels of A and C

Author: Jake Date: 2024-10-02 15:03:15

Completed set by Jake

Stream: **West River** Reach: **R25-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**199.70**	2.11 Riffle/Step Spacing:	**650 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.60**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**1.05**	Bedrock:	**0.0 %**	Bar:	**200**	**mm**
2.4 Floodprone Width (ft.):	**600.00**	Boulder:	**2.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**52.0 %**	Stream Type:	**C1**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**190.19**	Fine Gravel:	**5.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.00**	Sand:	**12.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.25**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**2.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**18**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**139.4**	**53.7**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.7**	**5.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**0**	**550**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**25.0**	Gullies Length	**0**	
Gullies	**None**				

Page:86

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:35:28

Do you think this could fit a D type with the very high W/D, aggradation, and the multiple channels?

Author: Joe Subject: Joe Date: 2024-12-03 16:42:18

I think this is mostly due to temporary increases in sediment loads from recent floods, not a reference D. Could do a departure to D, but that also seems like a stretch?

Stream: **West River** Reach: **R25-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**2**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:		Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):		**317**
Side:	**8**	Braiding:	**4**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.52**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**1	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**42**			Stream Sensitivity	**High**

Page:87

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:52:23

Missing an answer for 7.4 row 4

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-C**
Segment Length(ft): **4,221**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **9/23/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Between Holden Hill Rd and VT 100**

Step 5 - Notes:

Step 7 - Narrative: **The channel was historically straightened and is pinned against the right valley wall. Large unvegetated side bars were observed through most of the segment suggesting that aggradation is the dominant process. We observed some areas of erosion, but not enough to suggest that widening is prevalent.2**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:			
Road:			
Railroad:			
Imp. Path:			
Dev.:			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Very Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **735**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Page:88

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 08:56:55

Suggest 'Valley parallel to Holden Hill Rd (west) and VT 100 (east)' or something to indicate it is not intersection to intersection

Author: Jake Date: 2024-10-02 15:05:28

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 16:03:07

Could the channel already have widened, given how much higher bankfull width is compared to the reference and segments A/D?

Author: Joe Subject: Joe Date: 2024-12-03 16:49:35

agreed, updated language

Stream: **West River** Reach: **R25-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**96.80**	2.11 Riffle/Step Spacing:	**1000 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.80**	2.12 Substrate Composition		Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**2.09**	Bedrock:	**0.0 %**	Bar:	**300**	**mm**
2.4 Floodprone Width (ft.):	**400.00**	Boulder:	**13.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.00**	Cobble:	**65.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**14.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**46.32**	Fine Gravel:	**1.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**4.13**	Sand:	**7.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.32**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**12**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**206.3**	**212.9**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**8.0**	**6.0**	Sub-dominant:	**Coniferous**	**Coniferous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**1-25**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**51-100**	**None**
W less than 25	**1,542**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Coniferous**
Sub-Dominant	**Coniferous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**17.5**	Gullies Length	**0**	
Gullies	**None**				

Stream: **West River** Reach: **R25-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**2,263**
Side: **7**	Braiding: **1**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11**1	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Page:90

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:21:43

Missing answers in all rows for 7.4

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R25-D**
Segment Length(ft): **4,360**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: 1
Completion Date: **8/8/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: 2

Step 5 - Notes:

Step 7 - Narrative: **The segment is historically straightened and is deeply incised. Incision is the dominant process, however we did observe formation of large side bars suggesting that aggradation may be starting.**

Step 1. Valley and Floodplain

1.1 Segmentation: 4

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**0**		
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**828**		

1.4 Adjacent Side Left Right 3

Hillside Slope:

Continuous w/ Bank:

Within 1 Bankfull W:

Texture:

1.5 Valley Features

Valley Width (ft): **731**

Width Determination: **Measured**

Confinement Type: VB 5

In Rock Gorge: **No**

Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:08:29

Please add observers

Author: Jake Date: 2024-10-02 15:07:57

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 08:57:25

Please add location

Author: Jake Date: 2024-10-02 15:09:46

Completed set by Jake

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:10:42

No data entered for Step 1.4

Number: 4 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 15:07:03

Please add segmentation reason

Number: 5 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 16:23:54

Should the reference stream type of Bc be updated considering VB confinement? Perhaps noting the narrowing of the valley near the segment break.

Author: Joe Subject: Joe Date: 2024-12-03 16:55:55

Reduced to 600, still VB is appropriate for most of segment.

Stream: **West River** Reach: **R25-D**

Step 2. Stream Channel

2.1 Bankfull Width (ft.):	**61.10**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**3.40**	2.12 Substrate Composition		Bed:	**350 mm**
2.3 Mean Depth (tf):	**2.24**	Bedrock:	**0.0 %**	Bar:	**120 mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**17.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**8.50**	Cobble:	**48.0 %**	Stream Type:	**F**
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**
2.6 Width/Depth Ratio:	**27.28**	Fine Gravel:	**2.0 %**	Subclass Slope:	
2.7 Entrenchment Ratio:	**1.23**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**2.50**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**8**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**247.8**	**0.0**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.2**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**36.5**	**0.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**51-100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**1,598**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Mixed Trees**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Forest**	Mass Failures		
Sub-dominant	**Forest**	**Hay**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**2**	
Failures	**One**	**30.0**	Gullies Length	**280**	
Gullies	**Multiple**	**7.5**			

Page:92

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-29 16:27:27

Based on the notes in the cross section, should the bankfull elevation be higher (5)?

Author: Joe Date: 2024-12-03 16:58:39

Rejected set by Joe

Author: Joe Subject: Joe Date: 2024-12-03 16:58:35

BKFH was reduced to line up with CSM values. The field measured height is very high.

Stream: **West River** Reach: **R25-D**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**3**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,579**
Side:	**3**	Braiding:	**1**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**6**	**B to F**	**Yes**	Geomorphic Rating	**0.47**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**38**			Stream Sensitivity	**Extreme**

Page:93

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 09:06:28

See comment for 1.5 and update if needed

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R26**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Weston**
1.3 Downstream Latitude: **43.28945**
1.3 Downstream Longitude: **-72.79389**

Step 2. Stream Type

2.1 Elevation Upstream: **1,303**
2.1 Elevation Downstream: **1,280**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,209.0** ft. **0.23** Miles
2.3 Valley Slope: **1.9**
2.4 Channel Length: **1,412.0** ft. **0.27** Miles
2.5 Channel Slope: **1.63 %**
2.6 Sinuosity: **1.17**
2.7 Watershed Area: **26.3** Square Miles
2.8 Channel Width: **55.3** feet
2.9 Valley Width: **1,219.0** feet
2.10 Confinement Ratio: **22.1**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **B** 1
Bedform: **Plane Bed** 2
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Other** **63.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **Not Rated** **63.0** %
Flooding: **None/Rare** **63.0** %
Water Table Deep: **6.0** **36.0** %
Water Table Shallow: **6.0** **36.0** %
Erodibility: **slight** %
7.4 Comments:

Reach likely impacted by dam upstream. Bank heights > 15 ft. observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **91.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **55.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**26-50**	**51-100**
Length w / less than 25 ft.:	**942.0** ft.	**332.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **14.7** %
5.3 Bank Armoring: **1,412.0** **1.0** %
Left: **1,023.0** ft. Right: **999.3** ft.
5.4 Channel Straightening: **1,030.9** **73.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **203.7** ft. **14.4**

	One Side	Both Sides
Road:	**203.7** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,109.4** ft. **294.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **67.2344818** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	2 High	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	1 Low	14

Page:94

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:31:35

Should the reference stream type of Bc be updated to C considering VB confinement?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:40:45

Do you think this characterization of the reference bedform should be plane bed or riffle pool considering upstream and downstream reference types and the departure noted in Step 7?

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R26-0**
Segment Length(ft): **1,412**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, JWC**
Completion Date: **10/20/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 100 bisected by the Lawrence Hill Road**

Step 5 - Notes:

Step 7 - Narrative: **The entire reach is straightened and deeply incised with extensive bank armoring. The sediment regime is strongly affected by the large upstream dam. The reach is stuck in Stage II with no chance of adjustment.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	204	20	372	6
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,109		294	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Very Steep	Very Steep
Continuous w/ Bank:	Always	Sometimes
Within 1 Bankfull W:	Always	Sometimes
Texture:	Boulder	Boulder

1.5 Valley Features

Valley Width (ft): **200**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Page:95

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:24:42

JHB

Author: Jake Date: 2024-10-02 15:10:23

Completed set by Jake

Stream: **West River** Reach: **R26-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**41.00**	2.11 Riffle/Step Spacing:	**100 ft.**	2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**3.80**	2.12 Substrate Composition		Bed:	**600 mm**
2.3 Mean Depth (tf):	**2.89**	Bedrock:	**15.0 %**	Bar:	**90 mm**
2.4 Floodprone Width (ft.):	**50.00**	Boulder:	**40.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**12.00**	Cobble:	**30.0 %**	Stream Type:	**F**
Human Elev FloodPln (ft.):		Coarse Gravel:	**5.0 %**	Bed Material:	**Boulder** 2
2.6 Width/Depth Ratio:	**14.19**	Fine Gravel:	**5.0 %**	Subclass Slope:	
2.7 Entrenchment Ratio:	**1.22**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**
2.8 Incision Ratio:	**3.16**	Silt and Smaller:	**%**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Low**	Detritus:	**1.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**1**	Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**34.6**	**32.7**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Cohesive**	**Cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**1,023.0**	**999.3**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**51-100** 3	**51-100**
W less than 25	**942**	**332**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Residential**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:96

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:52:25

Cross section bankfull and edge water notes don't line up with data

Author: Joe Subject: Joe Date: 2024-12-05 10:56:32

Notes were copied over from a different XS, this one was dimensioned due to access and depth.

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:12:00

Should P1 Step 2.11 be updated?

Author: Joe Subject: Joe Date: 2024-12-05 10:57:45

No, the boulders are from historic channel armoring below the dam, reference condition should be cobble based on slope.

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:34:13

Should P1 4.3 be updated for left bank?

Author: Jake Date: 2024-10-02 15:15:22

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:15:24

Value resets to original value after update is saved

Stream: **West River** Reach: **R26-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**1**
		4.6 Up/Down Strm flow reg.:	**Up Stream**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	1	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:		Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,031**
Side:	**1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**3**	**B to F** 2	**Yes**	Geomorphic Rating	**0.29**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**5**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**6**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**23**			Stream Sensitivity	**High**

Page:97

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:35:23

Should P1 6.3 be updated?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:48:40

See note on reference type. Do you think it could be reference C?

Author: Joe Date: 2024-12-05 11:11:56

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 11:11:49

agreed, updated

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R27**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Weston**
1.3 Downstream Latitude: **43.29270**
1.3 Downstream Longitude: **-72.79298**

Step 2. Stream Type

2.1 Elevation Upstream: **1,317**
2.1 Elevation Downstream: **1,303**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,634.0** ft. **0.50** Miles
2.3 Valley Slope: **0.5**
2.4 Channel Length: **2,698.0** ft. **0.51** Miles
2.5 Channel Slope: **0.52 %**
2.6 Sinuosity: **1.02**
2.7 Watershed Area: **22.7** Square Miles
2.8 Channel Width: **51.7** feet
2.9 Valley Width: **984.0** feet
2.10 Confinement Ratio: **19.0**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Dam**
3.3 Dominant Geological Mat.: **Alluvial** **53.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **B** **77.0** %
Flooding: **Occasional** **53.0** %
Water Table Deep: **3.0** **53.0** %
Water Table Shallow: **1.5** **77.0** %
Erodibility: **slight** **1.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **91.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **42.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**1,284.0** ft.	**1,269.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: **2** **10.3** %
5.3 Bank Armoring: **975.2** **36.1** %
Left: **737.5** ft. Right: **237.7** ft.
5.4 Channel Straightening: **1,044.3** **38.7** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,698.5** ft. **100.0**

	One Side	Both Sides
Road:	**2,698.5** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,426.2** ft. **0.0** ft.
6.3 Channel Bars: 2
6.4 Meander Migration:
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **23.7798328** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	2 High	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	0 N.D.	0 N.D.	0 N.S.	0 N.S.	14

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 10:02:45

Please update with data form P2 3.2

Author: Jake Date: 2024-10-02 15:16:32

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:16:52

Buffer value reverts to blank after updates are saved

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 10:01:49

Please update with data from P2 5.1

Author: Joe Date: 2024-12-05 11:12:32

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R27-0**
Segment Length(ft): **2,698**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: 1
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 100**

Step 5 - Notes:

Step 7 - Narrative: **The majority of the reach is backwatered by the historic dam. The upper portion of the reach shows signs of aggradation of gravel. Elevated but accessible floodplain is located through most of the reach. Incision has caused a departure from C to Bc.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments: 2

	Length (ft)	One	Height	Both	Height
Berm:	0				
Road:	2,698	4			
Railroad:	0				
Imp. Path:	0				
Dev.:	1,426				

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **415**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Dam	**Mid-Segment**	**15.0**	**15.0**	**No**	**No**

Page:99

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 09:49:20

Please add date

Author: Jake Date: 2024-10-02 15:18:49

Completed set by Jake

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 09:30:33

Should FIT be updated to include driveway encroachment on the right bank?

Author: Joe Date: 2024-12-05 11:14:14

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 11:14:11

Added

Stream: **West River** Reach: **R27-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**73.90**	2.11 Riffle/Step Spacing:	1	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**4.20**	2.12 Substrate Composition			Bed:	**30**	**mm**
2.3 Mean Depth (tf):	**3.19**	Bedrock:	**0.0 %**		Bar:	**20**	**mm**
2.4 Floodprone Width (ft.):	**140.00**	Boulder:	**3.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**7.70**	Cobble:	**9.0 %**	Stream Type:	**B**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**47.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**23.17**	Fine Gravel:	**25.0 %**	Subclass Slope:	**c**		
2.7 Entrenchment Ratio:	**1.89**	Sand:	**16.0 %**	Bed Form:	**Plane Bed**		
2.8 Incision Ratio:	**1.83**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**2**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**23.8**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**737.5**	**237.7**	Canopy %:	**0**	**0**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**1,284**	**1,269**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right 2		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:100

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-22 14:12:57

Value?

Author: Joe Date: 2024-12-05 11:16:10

Rejected set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 11:15:23

Reach is backwatered by dam

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:30:00

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-10-02 15:18:58

Completed set by Jake

Stream: **West River** Reach: **R27-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**1**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**1,044**
Side: **3**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to B**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**8**	**None**	**Yes**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R28**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Weston**
1.3 Downstream Latitude: **43.29821**
1.3 Downstream Longitude: **-72.78734**

Step 2. Stream Type

2.1 Elevation Upstream: **1,391**
2.1 Elevation Downstream: **1,317**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **7,277.0** ft. **1.38** Miles
2.3 Valley Slope: **1.0**
2.4 Channel Length: **9,011.0** ft. **1.71** Miles
2.5 Channel Slope: **0.82 %**
2.6 Sinuosity: **1.24**
2.7 Watershed Area: **22.1** Square Miles
2.8 Channel Width: **51.2** feet
2.9 Valley Width: **1,435.0** feet
2.10 Confinement Ratio: **28.0**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Alluvial** **71.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **64.0** %
Flooding: **Occasional** **64.0** %
Water Table Deep: **3.0** **64.0** %
Water Table Shallow: **1.5** **64.0** %
Erodibility: **Moderate** **26.0** %
7.4 Comments: 4

Bank heights of 2 to > a5 ft. observed, particulary along road.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **91.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **35.0** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant: 1	**0-25**	**0-25**
Sub-dominant:	**26-50**	**26-50**
Length w / less than 25 ft.:	**1,509.0** ft.	**1,041.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: 2 **3** **4.3** %
5.3 Bank Armoring: **1,141.9** **12.7** %
Left: **703.1** ft. Right: **438.8** ft.
5.4 Channel Straightening: **1,675.3** **18.6** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old:	**4,375.9** ft.	**48.6**
	One Side	Both Sides
Road:	**4,375.9** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **1,380.4** ft. **0.0** ft.
6.3 Channel Bars: 3 **Point**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **382 ft.** Rato: **7.5**
6.6 Wavelength: **998 ft.** Ratio: **19.5**

Step 7. Windshield Survey

7.1 Bank Erosion: **221.4700012** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	1 Low	1 Low	0 N.S.	2 High	1 Low	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	14

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 10:57:23

Should dominant be updated considering that 0-25 is not dominant on either segment?

Author: Jake Date: 2024-10-02 15:19:32

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:19:33

Values revert to original value after updates are saved

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 09:44:13

Based on the imagery, it looks like there is a bridge missing from the FIT here: 72.7896487°W 43.3094739°N

Author: Joe Date: 2024-12-05 11:28:58

Completed set by Joe

Author: Evelyn.Boardman Subject: Sticky Note Date: 2024-08-08 09:49:07

Is this point maybe in the wrong location? 72.7887425°W 43.3166948°N

Author: Joe Subject: Joe Date: 2024-12-05 11:28:51

Correct, updated structex and FIT

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 11:00:39

Should 6.3 be updated with P2 data (5.1)?

Author: Joe Date: 2024-12-05 11:32:57

Completed set by Joe

Number: 4 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 10:51:41

Please add note describing segmentation that happened in Phase 2

Author: Joe Date: 2024-12-05 11:33:49

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R28-A**
Segment Length(ft): **1,634**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: **7/28/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT100**

Step 5 - Notes:

Step 7 - Narrative: **The segment typically has a narrower channel with signs of active aggradation. Small areas of erosion and bank armor were observed but active widening is minimal.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	0		
Road:	594	5	
Railroad:	0		
Imp. Path:	0		
Dev.:	97		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Flat	Flat
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Never
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft): **920**
Width Determination: **Estimated**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Page:103

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 10:42:09

In comparison to reference or adjacent reach/segment?

Author: Joe Date: 2024-12-05 11:37:35

Completed set by Joe

Stream: **West River** Reach: **R28-A1**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**32.40**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.50**	2.12 Substrate Composition		Bed:	**90**	**mm**
2.3 Mean Depth (tf):	**2.55**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**100.00**	Boulder:	**2.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.80**	Cobble:	**26.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**12.71**	Fine Gravel:	**12.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.09**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.66**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**67.7**	**13.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.0**	**2.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**130.2**	**111.4**	Canopy %:	**0**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**1,171**	**335**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Commercial**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Page:104

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 10:48:48

Is it possible to organize photos by segment? Or tag them in the photo log as such?

Author: Joe Date: 2024-12-05 11:50:14

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 11:50:11

Uploaded the split folders to shared drive

Stream: **West River** Reach: **R28-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**Down Stream**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**		
Mid:	**1**	Delta:	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts	Head Cuts:	**0**	Straightening Length (ft.):	**158**		
Side:	**6**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9** 1	**None**	**Yes**	Geomorphic Rating	**0.51**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**41**			Stream Sensitivity	**Very High**

Page:105

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 11:03:45

Should degradation score be a little higher with 1 fair and the rest good?

Author: Joe Date: 2024-12-05 11:58:01

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 11:57:56

agreed

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R28-B**
Segment Length(ft): **7,377**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JMD**
Completion Date: **7/28/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Greendale Road bridge to between VT 100 and Lawrence Hill Road**

Step 5 - Notes:

Step 7 - Narrative: **The channel is actively widening and aggrading with many large depositional features and undercut banks. We assessed the reach as late stage III progressing towards planform adjustment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Depositional Features**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**3,782**	**7**	
Railroad:	**0**		
Imp. Path:	**617**	**5**	
Dev.:	**1,283**		

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **911**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**4.0**	**1.0**	**No**	**No**

Page:106

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 10:28:27

Should there be more grade controls listed from FIT?

Author: Joe Date: 2024-12-05 12:06:34

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 12:06:31

DMS crashes if we try to enter more than 1

Stream: **West River** Reach: **R28-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**85.70**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.30**	2.12 Substrate Composition		Bed:	**160**	**mm**
2.3 Mean Depth (tf):	**1.78**	Bedrock:	**0.0 %**	Bar:	**50**	**mm**
2.4 Floodprone Width (ft.):	**300.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.60**	Cobble:	**32.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**33.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**48.15**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.50**	Sand:	**20.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.70**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**22**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**127.9**	**13.0**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.4**	**3.0**	Sub-dominant:	**Herbaceous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**572.9**	**327.4**	Canopy %:	**51-75**	**51-75**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**51-100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**337**	**705**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Pasture**	**Forest**
Sub-dominant	**Forest**	**Pasture**
(Legacy)	Amount	Mean Hieght
Failures	**Multiple**	**20.7**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R28-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	41	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**12**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**	
Mid:	**6**	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	**4**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**1,517**
Side:	**19**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**None**	**Yes**	Geomorphic Rating	**0.43**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**34**			Stream Sensitivity	**Very High**

Page:108

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:18:53

Please update P1 7.3

Author: Joe Date: 2024-12-05 12:16:49

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R29**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Weston**
1.3 Downstream Latitude: **43.31757**
1.3 Downstream Longitude: **-72.78775**

Step 2. Stream Type

2.1 Elevation Upstream: **1,446**
2.1 Elevation Downstream: **1,391**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,427.0** ft. **0.65** Miles
2.3 Valley Slope: **1.6**
2.4 Channel Length: **3,619.0** ft. **0.69** Miles
2.5 Channel Slope: **1.52 %**
2.6 Sinuosity: **1.06**
2.7 Watershed Area: **9.2** Square Miles
2.8 Channel Width: **34.8** feet
2.9 Valley Width: **575.0** feet
2.10 Confinement Ratio: **16.5**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Ice-Contact** **54.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **A** **50.0** %
Flooding: **None/Rare** **56.0** %
Water Table Deep: **6.0** **51.0** %
Water Table Shallow: **6.0** **51.0** %
Erodibility: **Severe** **51.0** %
7.4 Comments: 3

Bank heights 2 to > 15 ft. observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **93.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **37.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100** 1
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**109.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **3** **12.1** %
5.3 Bank Armoring: **309.2** **8.5** %
Left: **217.1** ft. Right: **92.1** ft.
5.4 Channel Straightening: **1,037.6** **28.7** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,730.1** ft. **47.8**

	One Side	Both Sides
Road:	**1,730.1** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **666.6** ft. **0.0** ft.
6.3 Channel Bars: **None** 2
6.4 Meander Migration: **No Data**
6.5 Meander Width: **107 ft.** Rato: **3.1**
6.6 Wavelength: **335 ft.** Ratio: **9.6**

Step 7. Windshield Survey

7.1 Bank Erosion: **261.6617126** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	1 Low	1 Low	2 High	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	1 Low	0 N.S.	1 Low	1 Low	13

Page:109

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 11:24:24

Should this be updated considering it is not dominant or subdominant in the phase 2 results?

Author: Jake Date: 2024-10-02 15:20:12

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:20:29

Values revert to original values after updates are saved

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 11:27:30

Should 6.3 be updated considering Phase 2 results (Step 5.1)?

Author: Joe Date: 2024-12-05 12:17:52

Completed set by Joe

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 11:19:18

Please add note describing segmentation that happened in Phase 2

Author: Joe Date: 2024-12-05 12:27:36

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R29-A**
Segment Length(ft): **2,673**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Felton Road to Greendale Road bridge along VT 100**

Step 5 - Notes:

Step 7 - Narrative: **The lower portion of the segment is stable with well formed steps. The middle and upper portions have large depositional features and indicate that aggradation is active.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	822	10	442	9
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	563		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Very Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **180**
Width Determination: **Measured**
Confinement Type: **SC**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**8.0**	**6.0**	**No**	**No**

Stream: **West River** Reach: **R29-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**32.80**	2.11 Riffle/Step Spacing:	**170 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.50**	2.12 Substrate Composition		Bed:	**220**	**mm**
2.3 Mean Depth (tf):	**1.92**	Bedrock:	**0.0 %**	Bar:	**200**	**mm**
2.4 Floodprone Width (ft.):	**56.00**	Boulder:	**49.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.40**	Cobble:	**22.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**13.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**17.08**	Fine Gravel:	**8.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.71**	Sand:	**8.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**2.16**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**14**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**121.1**	**73.8**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.1**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**217.1**	**92.1**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-Dominant	**None**	**51-100**
W less than 25	**109**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Residential**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R29-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**4**	Delta:		Flood chutes:	**1**	Avulsion:	**1**	5.5 Straightening:	**Straightening**
Point:		Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**211**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type		Left	Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:			
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection			
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:			
Habitat Rating:	**0.00**						
Habitat Stream Condition:							

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**Yes**	Geomorphic Rating	**0.60**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**1	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**48**			Stream Sensitivity	**High**

Page:112

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 11:34:58

Should Row 1 score be reference for low W/D?

Author: Joe Date: 2024-12-05 12:29:07

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R29-B**
Segment Length(ft): **946**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Between VT 100 and Felton Road**

Step 5 - Notes:

Step 7 - Narrative: **Short segment with major historic impacts from straightening and encroachment resulting in an incised channel. We observed large deposits of coarse gravel suggesting that the channel is aggrading and in stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Subreach**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	908	10		29	10
Railroad:	0			0	
Imp. Path:	0			0	
Dev.:	103			0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Flat
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Never
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	426
Width Determination:	Measured
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Stream: **West River** Reach: **R29-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**34.90**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.70**	2.12 Substrate Composition		Bed:	**359**	**mm**
2.3 Mean Depth (tf):	**1.77**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**52.00**	Boulder:	**15.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.80**	Cobble:	**45.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**19.72**	Fine Gravel:	**7.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.49**	Sand:	**14.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.78**	Silt and Smaller:	**1.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**1**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**66.8**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.5**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-Dominant	**None**	**26-50**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Shrubs/Sapling**
Sub-Dominant	**Herbaceous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**
Sub-dominant	**Residential**	**Commercial**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R29-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features	Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**		
Mid:	**2**	Delta:		Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**1**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**827**
Side:		Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to B**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **West River**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **R30**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Weston**
1.3 Downstream Latitude: **43.32507**
1.3 Downstream Longitude: **-72.78049**

Step 2. Stream Type

2.1 Elevation Upstream: **1,603**
2.1 Elevation Downstream: **1,446**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **9,045.0** ft. **1.71** Miles
2.3 Valley Slope: **1.7**
2.4 Channel Length: **10,174.0** ft. **1.93** Miles
2.5 Channel Slope: **1.54 %**
2.6 Sinuosity: **1.12**
2.7 Watershed Area: **7.6** Square Miles
2.8 Channel Width: **31.9** feet
2.9 Valley Width: **570.0** feet
2.10 Confinement Ratio: **17.9**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Alluvial** **83.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **C** **88.0** %
Flooding: **Frequent** **83.0** %
Water Table Deep: **1.5** **83.0** %
Water Table Shallow: **0.0** **83.0** %
Erodibility: **slight** **9.0** %
7.4 Comments: 3

Bank heights range from 2 to 8 ft.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **92.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: 1 **Forest** **58.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**2,428.0** ft.	**3,221.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **10** **11.1** %
5.3 Bank Armoring: **1,084.7** **10.7** %
Left: **659.2** ft. Right: **425.4** ft.
5.4 Channel Straightening: **4,019.6** **39.5** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,641.5** ft. **16.1**

	One Side	Both Sides
Road:	**1,641.5** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **371.2** ft. **0.0** ft.
6.3 Channel Bars: 2 **None**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **1205.3532715** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	1 Low	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	1 Low	1 Low	12

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 15:38:03

Should dominant and subdominant be updated considering Phase 2 results?

Author: Jake Date: 2024-10-02 15:20:41

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:20:56

Values revert to original values after updates are saved

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 15:39:43

Should 6.3 be updated (Phase 2 5.1)?

Author: Joe Date: 2024-12-05 13:51:25

Accepted set by Joe

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-30 15:29:16

Please add a note about the segmentation that happened in Phase 2

Author: Joe Date: 2024-12-05 14:01:43

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-A**
Segment Length(ft): **2,273**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 100 from Kile Road to Felton Road**

Step 5 - Notes:

Step 7 - Narrative: **Segment is moderately incised, likely due to historic straightening. We did not observe signs of active widening or planform adjustment. The reach is stuck in Stage II due to moderate incision.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:					
Road:					
Railroad:					
Imp. Path:					
Dev.:					

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Silt/Clay**	**Silt/Clay**

1.5 Valley Features
Valley Width (ft): **530**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**1.0**	**0.0**	**No**	**No**

Stream: **West River** Reach: **R30-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**14.60**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.90**	2.12 Substrate Composition		Bed:	**150**	**mm**
2.3 Mean Depth (tf):	**2.87**	Bedrock:	**0.0 %**	Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**170.00**	Boulder:	**1.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.00**	Cobble:	**5.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**5.09**	Fine Gravel:	**26.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**11.64**	Sand:	**14.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.54**	Silt and Smaller:	**%**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:	**E**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:	**Gravel**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**179.8**	**110.9**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**3.1**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**67.5**	**82.3**	Canopy %:	**0**	**0**
Material Type:	**Silt**	**Silt**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **West River** Reach: **R30-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**3**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**8**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**
Point:	**1**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**683**
Side:	**5**	Braiding: **0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.55**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**44**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-B**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers:
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **beaver dam**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan:
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side Left Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **West River** Reach: **R30-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):
2.2 Max Depth (ft.):
2.3 Mean Depth (tf):
2.4 Floodprone Width (ft.):
2.5 Aband. Floodpn (ft.):
Human Elev FloodPln (ft.):
2.6 Width/Depth Ratio: **0.00**
2.7 Entrenchment Ratio: **0.00**
2.8 Incision Ratio: **0.00**
Human Elevated Inc. Rat.: **0.00**
2.9 Sinuosity:
2.10 Riffles Type:

2.11 Riffle/Step Spacing:
2.12 Substrate Composition
Bedrock: %
Boulder: %
Cobble: %
Coarse Gravel: %
Fine Gravel: %
Sand: %
Silt and Smaller: %
Silt/Clay Present:
Detritus: %
Large Woody Debris:

2.13 Average Largest Particle on
Bed:
Bar:
2.14 Stream Type
Stream Type:
Bed Material:
Subclass Slope:
Bed Form:
Field Measured Slope:
2.15 Sub-reach Stream Type
Reference Stream Type:
Reference Bed Material:
Reference Subclass Slope:
Reference Bedform:

Step 3. Riparian Features

3.1 Stream Banks

Bank Texture

Upper	Left	Right
Material Type:		
Consistency:		
Lower		
Material Type:		
Consistency:		

Bank Erosion

	Left	Right
Erosion Length (ft.):		
Erosion Height (ft.):		
Revetment Type:		
Revetment Length:		

Typical Bank Slope:

Near Bank Vegetation Type

	Left	Right
Dominant:		
Sub-dominant:		
Bank Canopy		
Canopy %:		
Mid-Channel Canopy:		

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25		
Buffer Vegitation Type		
Dominant		
Sub-Dominant		

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant		
Sub-dominant		
(Legacy)	Amount	Mean Hieght
Failures		
Gullies		

	Left	Right
Mass Failures		
Height		
Gullies Number		
Gullies Length		

Stream: **West River** Reach: **R30-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	4.5 Flow Regulation Type	4.7 Stormwater Inputs **None**
4.2 Adjacent Wetlands:	Flow Reg. Use:	Field Ditch: Road Ditch:
4.3 Flow Status:	Impoundments:	Other: Tile Drain:
4.4 # of Debris Jams:	Impoundment Loc.:	Overland Flow: Urb Strm Wtr Pipe:
	4.6 Up/Down Strm flow reg.:	4.9 # of Beaver Dams:
	(old) Upstrm Flow Reg.:	Affected Length (ft):

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features	Neck Cutoff:	5.4 Stream Ford or Animal Crossing:
Mid:	Delta:	Flood chutes:	Avulsion:	5.5 Straightening:
Point:	Island:	5.3 Steep Riffles and Head Cuts	Head Cuts:	Straightening Length (ft.): **0**
Side:	Braiding:	Steep Riffles:	Trib Rejuv.:	5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:	6.4 Sediment Deposition:	Stream Gradiant Type	Left	Right
6.2 Pool Substrate:	6.5 Channel Flow Status:	6.8 Bank Stability:		
6.3 Pool Variability:	6.6 Channel Alteration:	6.9 Bank Vegetation Protection		
Total Score:	6.7 Channel Sinuosity:	6.10 Riparian Veg. Zone Width:		
Habitat Rating:				
Habitat Stream Condition:				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic	
7.1 Channel Degradation				Geomorphic Rating
7.2 Channel Aggradation				Channel Evolution Model
7.3 Widening Channel				Channel Evolution Stage
7.4 Change in Planforml				Geomorphic Condition
Total Score				Stream Sensitivity

Phase 2 Segment Summary Report West River

Stream: **West River**
Reach: **R30-C**
Segment Length(ft): **7,152**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **10/21/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along VT 155 from Shattuck Road to above the beaver meadow north of Kile Road**

Step 5 - Notes:

Step 7 - Narrative: **Segment has extensive historic straightening and is general moderate to severely incised. Some areas of bank erosion show that widening and planform adjustment are starting, however the majority of the segment remains in Stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both	Height
Berm:	934	4	0	
Road:	1,642	8	425	6
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	371		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Flat	Flat
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Never
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft): **615**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **West River** Reach: **R30-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**16.67**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**180**	**mm**
2.3 Mean Depth (tf):	**2.30**	Bedrock:	**0.0 %**	Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**28.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.90**	Cobble:	**34.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**42.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**7.25**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.68**	Sand:	**10.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.03**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**11**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**413.3**	**501.4**	Dominant:	**Shrubs/Sapling**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.1**	**2.4**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**591.7**	**343.1**	Canopy %:	**1-25**	**1-25**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**>100**	**26-50**
W less than 25	**2,428**	**3,221**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Mixed Trees**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**Forest**	**Forest**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Phase 2 Segment Summary Report — West River

Stream: **West River** Reach: **R30-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**1**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	41	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**	
Mid:	**4**	Delta:	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**	
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**3,337**	
Side:	**13**	Braiding: **0**	Steep Riffles:	**4**	Trib Rejuv.:		5.5 Dredging:	**None**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**6**	**C to F**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**Extreme**

Page:125

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:19:29

Should P1 7.3 be updated?

Author: Joe Date: 2024-12-05 14:02:04

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Utley Brook**
Topo Maps: **LONDONDERRY**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T14.01**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.22835**
1.3 Downstream Longitude: **-72.81328**

Step 2. Stream Type

2.1 Elevation Upstream: **1,165**
2.1 Elevation Downstream: **1,114**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,200.0** ft. **0.80** Miles
2.3 Valley Slope: **1.2**
2.4 Channel Length: **5,637.0** ft. **1.07** Miles
2.5 Channel Slope: **0.90 %**
2.6 Sinuosity: **1.34**
2.7 Watershed Area: **27.5** Square Miles
2.8 Channel Width: **56.3** feet
2.9 Valley Width: **303.0** feet
2.10 Confinement Ratio: **5.4**
2.10 Confinement Type: **Narrow**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **71.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **80.0** %
Flooding: **Frequent** **71.0** %
Water Table Deep: **6.0** **66.0** %
Water Table Shallow: **6.0** **66.0** %
Erodibility: **Moderate** **28.0** %
7.4 Comments: 2

Bank heights of 6-10 ft. and 15-20 ft. of erosion observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **53.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**382.0** ft.	**694.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **4.9** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: 1 **Point**
6.4 Meander Migration: **None**
6.5 Meander Width: **363 ft.** Ratio: **6.4**
6.6 Wavelength: **661 ft.** Ratio: **11.7**

Step 7. Windshield Survey

7.1 Bank Erosion: **981.9092407** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	1 Low	7

Page:126

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 08:47:03

Should 6.3 be updated (Phase 2 5.1)?

Author: Joe Date: 2024-12-05 14:03:58

Completed set by Joe

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 08:46:38

Please add a note about the segmentation that happened in Phase 2

Author: Joe Date: 2024-12-05 14:03:53

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.01-A**
Segment Length(ft): **4,669**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, JWC**
Completion Date: **11/11/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Barker Road from east of Landgrove Road to confluence with West River**

Step 5 - Notes:

Step 7 - Narrative: **The channel is incised likely due to historic manipulation, almost resulting in a departure to B. Banks indicated scour/erosion through most of the reach and the channel is overwidened, suggesting that widening is the dominant process.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	One	Height	Both	Height
Length (ft)				
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Steep**	**Steep**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **303**
Width Determination: **Measured**
Confinement Type: **NW**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **Utley Brook** Reach: **T14.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**69.00**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.42**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**140.00**1	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.70**	Cobble:	**39.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**22.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**28.51**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.03**	Sand:	**24.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.78**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**10**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**364.6**	**617.3**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.5**	**4.5**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**382**	**694**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**3**	
Failures	**Multiple**	**25.0**	Gullies Length	**290**	
Gullies	**Multiple**	**5.3**			

Page:128

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 10:10:27

The flood prone width in the cross section appears to be >200 feet. Please confirm the value.

Author: Joe Date: 2024-12-05 15:51:27

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 15:51:30

updated

Stream: **Utley Brook** Reach: **T14.01-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**2**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**10**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.50**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**40**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.01-B**
Segment Length(ft):
Rain:
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers:
Completion Date:
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **beaver dam**

Step 0 - Location:

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan:
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side Left Right
Hillside Slope:
Continuous w/ Bank:
Within 1 Bankfull W:
Texture:

1.5 Valley Features
Valley Width (ft):
Width Determination:
Confinement Type:
In Rock Gorge:
Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **Utley Brook** Reach: **T14.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):
2.2 Max Depth (ft.):
2.3 Mean Depth (tf):
2.4 Floodprone Width (ft.):
2.5 Aband. Floodpn (ft.):
Human Elev FloodPln (ft.):
2.6 Width/Depth Ratio: **0.00**
2.7 Entrenchment Ratio: **0.00**
2.8 Incision Ratio: **0.00**
Human Elevated Inc. Rat.: **0.00**
2.9 Sinuosity:
2.10 Riffles Type:

2.11 Riffle/Step Spacing:
2.12 Substrate Composition
Bedrock: %
Boulder: %
Cobble: %
Coarse Gravel: %
Fine Gravel: %
Sand: %
Silt and Smaller: %
Silt/Clay Present:
Detritus: %
Large Woody Debris:

2.13 Average Largest Particle on
Bed:
Bar:
2.14 Stream Type
Stream Type:
Bed Material:
Subclass Slope:
Bed Form:
Field Measured Slope:
2.15 Sub-reach Stream Type
Reference Stream Type:
Reference Bed Material:
Reference Subclass Slope:
Reference Bedform:

Step 3. Riparian Features

3.1 Stream Banks

Bank Texture

Upper	Left	Right
Material Type:		
Consistency:		
Lower		
Material Type:		
Consistency:		

Bank Erosion

	Left	Right
Erosion Length (ft.):		
Erosion Height (ft.):		
Revetment Type:		
Revetment Length:		

Typical Bank Slope:

Near Bank Vegetation Type

	Left	Right
Dominant:		
Sub-dominant:		
Bank Canopy		
Canopy %:		
Mid-Channel Canopy:		

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25		
Buffer Vegitation Type		
Dominant		
Sub-Dominant		

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant		
Sub-dominant		
(Legacy)	Amount	Mean Hieght
Failures		
Gullies		

	Left	Right
Mass Failures		
Height		
Gullies Number		
Gullies Length		

Stream: **Utley Brook** Reach: **T14.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams:

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.:

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**

Field Ditch: Road Ditch:

Other: Tile Drain:

Overland Flow: Urb Strm Wtr Pipe:

4.9 # of Beaver Dams:

Affected Length (ft):

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal: Mid: Delta: Point: Island: Side: Braiding:

5.2 Other Features Flood chutes:

5.3 Steep Riffles and Head Cuts Steep Riffles:

Neck Cutoff: Avulsion: Head Cuts: Trib Rejuv.:

5.4 Stream Ford or Animal Crossing:

5.5 Straightening:

Straightening Length (ft.): **0**

5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating

Channel Evolution Model

Channel Evolution Stage

Geomorphic Condition

Stream Sensitivity

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Utley Brook**
Topo Maps: **LONDONDERRY, WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T14.02**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Londonderry**
1.3 Downstream Latitude: **43.23875**
1.3 Downstream Longitude: **-72.81751**

Step 2. Stream Type

2.1 Elevation Upstream: **1,317**
2.1 Elevation Downstream: **1,165**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **9,877.0** ft. **1.87** Miles
2.3 Valley Slope: **1.5**
2.4 Channel Length: **10,803.0** ft. **2.05** Miles
2.5 Channel Slope: **1.41 %**
2.6 Sinuosity: **1.09**
2.7 Watershed Area: **24.7** Square Miles
2.8 Channel Width: **53.7** feet
2.9 Valley Width: **512.0** feet
2.10 Confinement Ratio: **9.5**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **81.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **80.0** %
Flooding: **Frequent** **81.0** %
Water Table Deep: **3.0** **46.0** %
Water Table Shallow: **1.5** **53.0** %
Erodibility: **slight** **18.0** %
7.4 Comments:
Bank heights of 2-10 ft. observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **89.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **58.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**0-25**
Length w / less than 25 ft.:	**1,919.0** ft.	**102.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **2.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **554.9** ft. **5.1**

	One Side	Both Sides
Road:	**554.9** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **244 ft.** Rato: **4.5**
6.6 Wavelength: **969 ft.** Ratio: **18.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **451.0592957** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	1 Low	8

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.02-0**
Segment Length(ft): **10,803**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, FCP**
Completion Date: **6/14/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Landgrove Road**

Step 5 - Notes:

Step 7 - Narrative: **The reach is highly variable but consistently showing signs of active aggradation and areas of widening. The lower portion has a split channel following recent floods (Irene?) with even flow between the two channels at baseflow. Significant midchannel sediment accumulation was observed throughout.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**				
Road:	**0**	**12**			
Railroad:	**0**				
Imp. Path:	**0**				
Dev.:	**0**				

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Sometimes**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **512**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**3.0**	**2.0**	**No**	**No**

Page:134

Number: 1 Author: Shannon.Pytlik Subject: Comment on Text Date: 2024-08-21 13:14:39

during?

Stream: **Utley Brook** Reach: **T14.02-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**58.40**	2.11 Riffle/Step Spacing:	**350 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**280**	**mm**
2.3 Mean Depth (tf):	**1.82**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**110.00**	Boulder:	**25.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.70**	Cobble:	**41.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**32.09**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.88**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.32**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**63**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**227.7**	**223.4**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.2**	**2.8**	Sub-dominant:	**None**	**Invasives**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,919**	**102**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Phase 2 Segment Summary Report — West River

Stream: **Utley Brook** Reach: **T14.02-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**6**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**8**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**4**	Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**27**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Utley Brook**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T14.04**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error** 1

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Landgrove**
1.3 Downstream Latitude: **43.26105**
1.3 Downstream Longitude: **-72.84836**

Step 2. Stream Type

2.1 Elevation Upstream: **1,377**
2.1 Elevation Downstream: **1,367**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,136.0** ft. **0.59** Miles
2.3 Valley Slope: **0.3**
2.4 Channel Length: **4,676.0** ft. **0.89** Miles
2.5 Channel Slope: **0.21 %**
2.6 Sinuosity: **1.49**
2.7 Watershed Area: **21.7** Square Miles
2.8 Channel Width: **50.8** feet
2.9 Valley Width: **630.0** feet
2.10 Confinement Ratio: **12.4**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **E**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **80.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **80.0** %
Flooding: **Frequent** **80.0** %
Water Table Deep: **2.5** **78.0** %
Water Table Shallow: **1.5** **78.0** %
Erodibility: **slight** **19.0** %
7.4 Comments:

Reach break with shallow gradient stream, beaver activity, and debris. Bank heights 2-3 ft.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **89.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **45.0** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**>100**
Sub-dominant:	**26-50**	**0-25**
Length w / less than 25 ft.:	**1,880.0** ft.	**97.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **7.4** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **669.7** ft. **14.3**

	One Side	Both Sides
Road:	**669.7** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **261 ft.** Rato: **5.1**
6.6 Wavelength: **249 ft.** Ratio: **4.9**

Step 7. Windshield Survey

7.1 Bank Erosion: **619.4235840** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	2 High	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	0 N.S.	0 N.S.	2 High	1 Low	1 Low	12

Page:137

Number: 1 Author: Shannon.Pytlik Subject: Highlight Date: 2024-08-21 13:15:38

Author: Joe Date: 2024-12-05 15:55:07

Deferred set by Joe

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.04-0**
Segment Length(ft): **4,676**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, FCP**
Completion Date: **6/15/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Hapgood Pond Road crossing to Cody Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **The channel is deeply incised due to historical straightening. We assessed the reach as Stage II, however aggradation and areas of widening were observed, suggesting that it is slowly transitioning to Stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	**0**		
Road:	**0**	**8**	
Railroad:	**0**		
Imp. Path:	**0**		
Dev.:	**0**		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft): **630**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Stream: **Utley Brook** Reach: **T14.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**45.80**	2.11 Riffle/Step Spacing:	**600 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition			Bed:	**80**	**mm**
2.3 Mean Depth (tf):	**2.62**	Bedrock:	**0.0 %**		Bar:	**60**	**mm**
2.4 Floodprone Width (ft.):	**58.00**	Boulder:	**1.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**7.00**	Cobble:	**0.0 %**	Stream Type:	**F**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**49.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**17.48**	Fine Gravel:	**38.0 %**	Subclass Slope:			
2.7 Entrenchment Ratio:	**1.27**	Sand:	**12.0 %**	Bed Form:	**Plane Bed**		
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**32**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**304.7**	**314.8**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**4.2**	**4.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**1-25**	**1-25**
Material Type:	**Sand**	**Sand**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100** 1
Sub-Dominant	**None**	**None**
W less than 25	**1,880**	**97**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Shrubs/Sapling** 2
Sub-dominant	**Shrubs/Sapling**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**One**	**17.0**
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Page:139

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 10:38:50

Please update P1 4.3 dominant and subdominant P2 observations

Author: Jake Date: 2024-10-02 15:30:41

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:30:53

Values revert to original values after saving updates

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:30:04

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-10-02 15:30:10

Completed set by Jake

Stream: **Utley Brook** Reach: **T14.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**2**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**5**	Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**16**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic		
7.1 Channel Degradation	**6**	**E to F**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation	**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel	**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml	**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score	**35**			Stream Sensitivity	**Extreme**

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 10:51:11

Should areas of straightening be added to the FIT given reference in Step 7 narrative?

Author: Joe Date: 2024-12-05 15:57:51

Completed set by Joe

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 10:58:30

Do you agree with the two different reference stream types (E on T14.04 and C for T14.05) after seeing both in the field?

Author: Joe Date: 2024-12-05 16:00:00

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 15:59:34

Good question, I think reference C is likely appropriate for both, updated 04

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 10:47:00

Should 7.2 row 4 and 7.3 row 1 be fair for E W/D ratio?

Author: Joe Date: 2024-12-05 16:02:48

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Utley Brook**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T14.05**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Landgrove, Peru**
1.3 Downstream Latitude: **43.26352**
1.3 Downstream Longitude: **-72.85763**

Step 2. Stream Type

2.1 Elevation Upstream: **1,413**
2.1 Elevation Downstream: **1,340**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **5,338.0** ft. **1.01** Miles
2.3 Valley Slope: **1.4**
2.4 Channel Length: **6,451.0** ft. **1.22** Miles
2.5 Channel Slope: **1.13 %**
2.6 Sinuosity: **1.21**
2.7 Watershed Area: **17.7** Square Miles
2.8 Channel Width: **46.4** feet
2.9 Valley Width: **898.0** feet
2.10 Confinement Ratio: **19.4**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **91.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **86.0** %
Flooding: **Frequent** **92.0** %
Water Table Deep: **6.0** **57.0** %
Water Table Shallow: **4.0** **55.0** %
Erodibility: **slight** **7.0** %
7.4 Comments:

Bank heights 2-5 ft and approximately 200 ft. of erosion observed.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **91.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **46.0** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**0-25**	**>100**
Length w / less than 25 ft.:	**568.0** ft.	**3,176.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **5** **8.8** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **816.2** ft. **12.7**

	One Side	Both Sides
Road:	**816.2** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **143 ft.** Rato: **3.1**
6.6 Wavelength: **346 ft.** Ratio: **7.5**

Step 7. Windshield Survey

7.1 Bank Erosion: **955.5651855** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	2 High	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	0 N.S.	1 Low	1 Low	1 Low	1 Low	12

Phase 2 Segment Summary Report West River

Stream: **Utley Brook**
Reach: **T14.05-0**
Segment Length(ft): **6,451**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **JHB, FCP**
Completion Date: **6/15/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Little Michigan Road crossing to Hapgood Pond Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **The reach was dominated by aggradation and widening with areas of bank erosion and large sediment deposits observed throughout. The channel is incised, likely due to historic management.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**				
Road:	**0**	**9**			
Railroad:	**0**				
Imp. Path:	**0**				
Dev.:	**0**				

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Flat**	**Flat**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Never**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **898**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **Utley Brook** Reach: **T14.05-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**40.75**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**100**	**mm**
2.3 Mean Depth (tf):	**1.37**	Bedrock:	**0.0 %**	Bar:	**40**	**mm**
2.4 Floodprone Width (ft.):	**100.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.40**	Cobble:	**7.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**68.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**29.74**	Fine Gravel:	**17.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**2.45**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.93**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Oxbows**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**53**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**245.9**	**709.6**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.4**	**5.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**>100**
W less than 25	**568**	**3,176**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Utley Brook** Reach: **T14.05-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**7**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**
Mid:	**3**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**None**
Point:	**9**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**0**
Side:	**25**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:		5.5 Dredging:		**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.46**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**37**			Stream Sensitivity	**Very High**

Page:144

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 13:36:20

Was there any evidence of historic straightening in the upper and lower sections? There are topographic features in adjacent fields that look like former meanders in the hillshade and imagery.

Author: Joe Date: 2024-12-05 16:03:16

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-05 16:03:14

yes, added to fit

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Jones Brook**
Topo Maps: **WESTON**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T14.S3.01**
SGAT Version: **4.53**
Date Last Edited: **May, 24 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Landgrove, Peru**
1.3 Downstream Latitude: **43.26242**
1.3 Downstream Longitude: **-72.85842**

Step 2. Stream Type

2.1 Elevation Upstream: **1,412**
2.1 Elevation Downstream: **1,368**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,509.0** ft. **0.29** Miles
2.3 Valley Slope: **2.9**
2.4 Channel Length: **2,058.0** ft. **0.39** Miles
2.5 Channel Slope: **2.14 %**
2.6 Sinuosity: **1.36**
2.7 Watershed Area: **3.4** Square Miles
2.8 Channel Width: **22.5** feet
2.9 Valley Width: **321.0** feet
2.10 Confinement Ratio: **14.2**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **E**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **59.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **B** **59.0** %
Flooding: **Frequent** **59.0** %
Water Table Deep: **2.5** **59.0** %
Water Table Shallow: **1.5** **59.0** %
Erodibility: **Moderate** **39.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **89.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Crop** **18.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	1	
Sub-dominant:		
Length w / less than 25 ft.:	**842.0** ft.	**847.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: 0 2 **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars:
6.4 Meander Migration: 3
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **395.8652954** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	1 Low	0 N.S.	6

Page:145

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 16:23:00

Please update with P2 data

Author: Jake Date: 2024-10-02 15:31:14

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:31:30

Values revert to previous values after saving updates

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 16:35:43

Add Hapgood Pond Road culvert. Not seeing an FIT point for this.

Author: Joe Date: 2024-12-05 16:05:22

Completed set by Joe

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 16:23:25

Please update with P2 data

Author: Joe Date: 2024-12-05 16:06:36

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **Jones Brook**
Reach: **T14.S3.01-0**
Segment Length(ft): **2,058**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/2/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From above Hapgood Pond Road crossing (bisecting reach) to confluence with Utley Brook**

Step 5 - Notes:

Step 7 - Narrative: **The reach is overwidened with many areas of active meander development. Large sediment deposits and erosion were observed throughout. We assessed the reach as stage IV with active planform adjustment along the widened and historically incised channel. We classified the reach as a departure from E to B due to incision.**

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	**0**				
Road:	**0**				
Railroad:	**0**				
Imp. Path:	**0**				
Dev.:	**0**				

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Sometimes**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features

Valley Width (ft): **321**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Stream: **Jones Brook** Reach: **T14.S3.01-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**21.00** 1	2.11 Riffle/Step Spacing:	**80 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition		Bed:	**80**	**mm**
2.3 Mean Depth (tf):	**1.29**	Bedrock:	**0.0 %**	Bar:	**30**	**mm**
2.4 Floodprone Width (ft.):	**35.00** 2	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**0.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**54.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**16.28**	Fine Gravel:	**29.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.67**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.96**	Silt and Smaller:	**7.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**8**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Moderate**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**223.6**	**172.3**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**3.6**	**3.5**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**0**	**0**
Material Type:	**Sand**	**Sand**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**51-100**	**51-100**
W less than 25	**842**	**847**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Pasture**	**Pasture**
Sub-dominant	**Commercial** 3	**Commercial**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Page:147

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:39:16

P1 = 22.5 and description notes overwidening. Should reference width be updated?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:30:10

The stream type is very sensitive to the choice of bankfull depth and where that puts the floodprone elevation on this cross section. Do you think this best fits a B or C departure? Please make a note about whether the reach is primarily entrenched as a B or has areas of greater floodplain access/C geometry.

Author: Joe Subject: Joe Date: 2024-12-05 16:12:00

Looking at the pictures and the cross-section it is definitely incised and appears to have areas of extreme incision. I updated reference to C type due to valley setting. Still have a departure to B.

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 16:21:38

Noted P1/P2 difference, but appears to only update through SGAT

Author: Jake Date: 2024-10-02 15:31:37

Completed set by Jake

Stream: **Jones Brook** Reach: **T14.S3.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **0**
Other: **0** Tile Drain: **21**
Overland Flow: **0** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid: **2**
Delta:
Point: **2**
Island:
Side: **19**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **0**
Avulsion: **0**

5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None2**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**10**	**E to B**	**Yes**
7.2 Channel Aggradation	**103**	**None**	**No**
7.3 Widening Channel	**74**	**None**	**No**
7.4 Change in Planforml	**8**	**None**	**No**
Total Score	**35**		

Geomorphic Rating **0.44**
Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Fair**
Stream Sensitivity **High**

Page:148

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:44:40

Not sure tile drain is the best fit for this residential drainage. See photo DSCN1485. Perhaps other?

Author: Joe Date: 2024-12-05 16:14:26

Completed set by Joe

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 10:24:29

Possible straightening at the upstream end of the reach?

Author: Joe Date: 2024-12-05 16:14:38

Completed set by Joe

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 16:26:45

Row 3 - do you think there is an increase in gravel and sand or is this the natural bed material for this reach?

Author: Evelyn.Boardman Subject: Sticky Note Date: 2024-12-05 16:15:10

Row 4 - With the floodprone width in 2.6 (16.28), this would be fair (12-20 for E channels)

Author: Joe Subject: Joe Date: 2024-12-05 16:15:41

There is a lot of active erosion in the portion we assessed, so likely some additional sand/gravel is working through

Number: 4 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 16:29:36

Row 1 - With the floodprone width in 2.6 (16.28), this would be fair (12-20 for E channels)

Author: Joe Date: 2024-12-05 16:16:03

Completed set by Joe

Author: Evelyn.Boardman Subject: Sticky Note Date: 2024-07-31 16:30:46

Row 3 - With current entrenchment (1.67) this would be Poor

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Flood Brook**
Topo Maps: **LONDONDERRY, PERU**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T13.04**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error** 1

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Peru**
1.3 Downstream Latitude: **43.24080**
1.3 Downstream Longitude: **-72.87256**

Step 2. Stream Type

2.1 Elevation Upstream: **1,442**
2.1 Elevation Downstream: **1,377**
2.1 Is Gradient Gentle?: **#Error** 2
2.2 Valley Length: **2,318.0** ft. **0.44** Miles
2.3 Valley Slope: **2.8**
2.4 Channel Length: **2,951.0** ft. **0.56** Miles
2.5 Channel Slope: **2.20 %**
2.6 Sinuosity: **1.27**
2.7 Watershed Area: **7.7** Square Miles
2.8 Channel Width: **32.1** feet
2.9 Valley Width: **380.0** feet
2.10 Confinement Ratio: **11.8**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **No Data**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Alluvial** **59.0** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **B** **99.0** %
Flooding: **Frequent** **59.0** %
Water Table Deep: **6.0** **99.0** %
Water Table Shallow: **4.0** **59.0** %
Erodibility: **Moderate** **39.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **61.0** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **33.3** **1.1** %
Left: **33.3** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **No Data**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Point**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **160 ft.** Rato: **5.0**
6.6 Wavelength: **531 ft.** Ratio: **16.5**

Step 7. Windshield Survey

7.1 Bank Erosion: **134.6201477** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	4

Page:149

Number: 1 Author: Shannon.Pytlik Subject: Highlight Date: 2024-08-21 13:34:31

Number: 2 Author: Shannon.Pytlik Subject: Highlight Date: 2024-08-21 13:34:07

Phase 2 Segment Summary Report West River

Stream: **Flood Brook**
Reach: **T13.04-0**
Segment Length(ft): **2,951**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From the confluence with Farnum Brook to Forest Mountain Road**

Step 5 - Notes:

Step 7 - Narrative: **The channel is slightly overwidened with extensive gravel deposition throughout the reach. We assessed the reach as Stage III due to aggradation.**

Step 1. Valley and Floodplain

1.1 Segmentation:
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **4681**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls: 2

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**0.0**	**0.0**	**No**	**No**

Page:150

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 15:26:10

Should P1 2.9 (380 ft) be updated?

Author: Joe Date: 2024-12-06 09:42:39

Completed set by Joe

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 10:28:24

Should there be more grade controls listed from FIT?

Author: Joe Date: 2024-12-06 09:43:31

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 09:45:20

causes a big DMS error

Stream: **Flood Brook** Reach: **T13.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**34.99**	2.11 Riffle/Step Spacing:	**100 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**60**	**mm**
2.3 Mean Depth (tf):	**1.36**	Bedrock:	**0.0 %**	Bar:	**130**	**mm**
2.4 Floodprone Width (ft.):	**120.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.90**	Cobble:	**47.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**35.0 %**	Bed Material:	**Gravel** 1	
2.6 Width/Depth Ratio:	**25.73**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**3.43**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.75** 2	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**91**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**134.6**	**0.0**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**0.0**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**33.3**	**0.0**	Canopy %:	**51-75**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None** 3
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Deciduous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Page:151

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 15:35:40

Should this be cobble based on the pebble count?

Author: Joe Date: 2024-12-06 09:46:03

Rejected set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 09:45:59

D50 is gravel

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 15:31:04

Thoughts on why the L/R pin elevation wasn't chosen as bankfull?

Author: Joe Date: 2024-12-06 13:29:43

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 09:52:12

We made some adjustments to keep the Manning's closer to the CSM range of other tribs. I adjusted it back up a little to split the difference and updated everything.

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 15:46:31

Should 4.3 subdominant be updated?

Author: Jake Date: 2024-10-02 15:32:57

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:32:58

Values revert to previous values after saving updates

Phase 2 Segment Summary Report — West River

Stream: **Flood Brook** Reach: **T13.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**21**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:		5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**6**	Delta:		Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**2**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**25**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.55**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**44**			Stream Sensitivity	**Very High**

Page:152

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:19:57

Please update P1 7.3

Author: Joe Date: 2024-12-06 13:31:27

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Farnum Brook**
Topo Maps: **PERU**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T13.S2.01**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Peru**
1.3 Downstream Latitude: **43.24501**
1.3 Downstream Longitude: **-72.87885**

Step 2. Stream Type

2.1 Elevation Upstream: **1,749**
2.1 Elevation Downstream: **1,424**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **8,451.0** ft. **1.60** Miles
2.3 Valley Slope: **3.8**
2.4 Channel Length: **9,077.0** ft. **1.72** Miles
2.5 Channel Slope: **3.58 %**
2.6 Sinuosity: **1.07**
2.7 Watershed Area: **2.1** Square Miles
2.8 Channel Width: **18.1** feet
2.9 Valley Width: **270.0** feet
2.10 Confinement Ratio: **15.0**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **61.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **B** **87.0** %
Flooding: **None/Rare** **61.0** %
Water Table Deep: **6.0** **87.0** %
Water Table Shallow: **6.0** **49.0** %
Erodibility: **Severe** **60.0** %
7.4 Comments: 4

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **88.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **51.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer: 1	Left Bank	Right Bank
Dominant:		
Sub-dominant:		
Length w / less than 25 ft.:	**1,060.0** ft.	**758.0** ft.

4.4 Ground Water Inputs:

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type:
Use:
5.2 Bridges and Culverts: 2 2 **0.9** %
5.3 Bank Armoring: **384.9** **4.2** %
Left: **172.0** ft. Right: **212.9** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **Dredging**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: 3
6.4 Meander Migration:
6.5 Meander Width: **ft.** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **547.0229492** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential:

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N.D.	0 N.D.	1 Low	0 N.S.	7

Page:153

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:09:28

Please update with P2 data

Author: Jake Date: 2024-10-02 15:33:14

Deferred set by Jake

Author: Jake Subject: Jake Date: 2024-10-02 15:33:11

Values revert to previous values after saving updates

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:30:53

Looks like farm crossing (DSCN1561) isn't in FIT. 72.8974633°W 43.2441723°N

Author: Joe Date: 2024-12-06 15:28:38

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 15:28:35

Added to Structex and FIT

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:09:38

Please update with P2 data

Author: Joe Date: 2024-12-06 16:09:54

Completed set by Joe

Number: 4 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:39:51

Please add note about segmentation that happened in P2

Author: Joe Date: 2024-12-06 16:10:00

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **Farnum Brook**
Reach: **T13.S2.01-A**
Segment Length(ft): **5,301**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **From Hapgood Pond Road crossing to confluence with Flood Brook**

Step 5 - Notes:

Step 7 - Narrative: **The segment showed evidence of recent but not active widening and very active aggradation throughout. Large side bars or coarse gravel and cobble were near continuous through the segment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Valley Width**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:			
Road:			
Railroad:			
Imp. Path:			
Dev.:			

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Hilly**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Never**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features
Valley Width (ft): **90**
Width Determination: **Measured**
Confinement Type: **NW**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes** 1

1.6 Grade Controls: 2

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge		**2.0**	**0.0**	**No**	**No**

Page:154

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:04:22

Do you think this might be naturally a more confined section of the reach? No encroachments in 1.3. It appears Lovers Lane and the trail were built on the side/top of the valley wall.

Author: Joe Date: 2024-12-06 16:11:14

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 16:11:19

agreed

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-07 12:49:54

Should there be more grade controls listed from FIT?

Author: Joe Date: 2024-12-06 16:10:18

Deferred set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 16:10:24

DMS crashes

Stream: **Farnum Brook** Reach: **T13.S2.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**20.50**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**1.25**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**31.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.00**	Cobble:	**48.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**38.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**16.40**	Fine Gravel:	**3.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.51**	Sand:	**6.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**1.67**	Silt and Smaller:	**%**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**112**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**26.6**	**37.8**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**6.0**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**33.8**	**78.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**14**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**11.7**	Gullies Length	**0**	
Gullies	**None**				

Stream: Farnum Brook Reach: T13.S2.01-A

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **31**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal:
Mid: **7**
Delta:
Point: **1**
Island:
Side: **44**
Braiding: **1**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **4**
Avulsion: **1**

5.3 Steep Riffles and Head Cuts
Steep Riffles: **1**
Head Cuts: **0**
Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	2	Score	STD	Historic		
7.1 Channel Degradation		**12**		**None**	**No**	Geomorphic Rating	**0.65**
7.2 Channel Aggradation		**10**		**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**		**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**19**	3	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**52**				Stream Sensitivity	**Moderate**

Page:156

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-07-31 15:20:15

Please update P1 7.3

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:16:00

Might confined fit this segment, if determined the valley width is natural? Seems to better fit the entrenchment ratio range for a B and the step-pool bed form.

Author: Joe Subject: Joe Date: 2024-12-06 16:13:56

Verified with LiDAR that 90ft is a conservative estimate for valley width, seems like it is unconfined for most of the reach.

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:21:28

No answers in DMS for individual questions on step 7.4. Please enter.

Author: Joe Date: 2024-12-06 16:19:48

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 16:19:45

Updated, changed score and sensitivity

Phase 2 Segment Summary Report West River

Stream: **Farnum Brook**
Reach: **T13.S2.01-B**
Segment Length(ft): **1,910**
Rain: **No**
Segment Version: Base

SGAT Version: **4.53**
Organization:
Observers: **EHB, RS**
Completion Date: **11/3/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Along Moss Brook Road from Batchelder Barn Road crossing to Hapgood Pond Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **This segment was assessed as Stage II due to historic incision. Coarse sediment deposition indicates that the segment may be aggrading, however widening and planform adjustment were not active.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Subreach**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	19	3	
Road:	0		
Railroad:	0		
Imp. Path:	0		
Dev.:	0		

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features
Valley Width (ft): **628**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **Yes**

1.6 Grade Controls:

Stream: **Farnum Brook** Reach: **T13.S2.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**14.00**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition			Bed:	**180**	**mm**
2.3 Mean Depth (tf):	**1.22**	Bedrock:	**0.0 %**		Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**1.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**2.80**	Cobble:	**54.0 %**	Stream Type:	**C**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**36.0 %**	Bed Material:	**Cobble**		
2.6 Width/Depth Ratio:	**11.48**	Fine Gravel:	**6.0 %**	Subclass Slope:			
2.7 Entrenchment Ratio:	**5.71**	Sand:	**3.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**1.56**	Silt and Smaller:	**%**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Moderate**	Detritus:	**4.0 %**	Reference Stream Type:	**C**		
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**1**	Reference Bed Material:	**Cobble**		
				Reference Subclass Slope:			
				Reference Bedform:	**Riffle-Pool**		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**204.8**	**179.4**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.7**	**3.0**	Sub-dominant:	**None**	**None**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**138.1**	**134.9**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**26-50**
Sub-Dominant	**None**	**None**
W less than 25	**1,046**	**758**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Hay**
Sub-dominant	**Residential**	**Residential**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Farnum Brook** Reach: **T13.S2.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**
Mid:	**1**	Delta:		Flood chutes:	**0**	Avulsion:	**1**	5.5 Straightening:	**None**
Point:		Island:	5.3 Steep Riffles and Head Cuts			Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**7**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:		5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7** 1	**None**	**Yes**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Page:159

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:34:31

Row 5 - Is there any evidence straightening that should be added to FIT?

Author: Joe Date: 2024-12-06 16:36:10

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 16:36:07

No, updated scoring

Phase 2 Segment Summary Report West River

Stream: Farnum Brook
Reach: T13.S2.01-C
Segment Length(ft): 1,866
Rain: No
Segment Version: Base

SGAT Version: 4.53
Organization:
Observers: EHB, RS
Completion Date: 11/3/2022
Qualtiy Control Status - Consultant: Provisional
Qualtiy Control Status - Staff: Provisional

Step 0 - Location: **Along Moss Brook Road from confluence of 2 small streams to form Farnum Brook to Batchelder Barn Road crossing**

Step 5 - Notes:

Step 7 - Narrative: **The reach is moderately incised due to historic straightening and a large historic berm that significantly reduces access to the left floodplain. Large deposits of coarse gravel and cobble throughout indicate that aggradation is the dominant process. Minimal widening or erosion was observed.**

Step 1. Valley and Floodplain

1.1 Segmentation: 1

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

	Length (ft)	One Height	Both Height
Berm:	505	3	
Road:	0		
Railroad:	0		
Imp. Path:	0		
Dev.:	0		

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft): 331
Width Determination: Measured
Confinement Type: VB
In Rock Gorge: No
Human Caused Change in Valley Width?: No

1.6 Grade Controls:

Page:160

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:39:30

Please add segmentation reason

Author: Joe Date: 2024-12-06 16:41:31

Completed set by Joe

Stream: **Farnum Brook** Reach: **T13.S2.01-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**17.80**	2.11 Riffle/Step Spacing:	**60 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.40**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**0.97**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**26.00**	Boulder:	**2.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.80**	Cobble:	**36.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):	**5.00**	Coarse Gravel:	**41.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**18.35**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.46**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.71**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**3.57**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	1	
2.9 Sinuosity:	**Low**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**32**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**32.2**	**66.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.0**	**2.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Page:161

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:43:56

Could this segment be C by reference considering VB confinement?

Author: Joe Date: 2024-12-06 16:43:35

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-06 16:43:30

Changed to C, probably a toss-up.

Phase 2 Segment Summary Report — West River

Stream: **Farnum Brook** Reach: **T13.S2.01-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**2**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**Yes**
Mid:	**4**	Delta:		Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**1**	Island:		5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**2**	Trib Rejuv.:		5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10** 1	**None**	**Yes**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11** 2	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Page:162

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:49:36

Row 2 - Selection is Fair. Should be poor based on IR and ER.

Author: Joe Date: 2024-12-06 16:45:02

Completed set by Joe

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-02 16:49:08

Row 3 - Selection is Fair. Should be poor based on IR and ER.

Author: Joe Date: 2024-12-06 16:45:06

Completed set by Joe

West River

Phase 1 - Reach Summary Report

Basin: **West, Saxton's, Williams**
Stream Name: **Winhall River**
Topo Maps: **PERU**
Watershed: **West River**
Sub-watershed: **West River -- Wardsboro Brook to mouth**

Reach ID: **T11.08**
SGAT Version: **4.53**
Date Last Edited: **May, 27 2024**
QA Status: **Step 2 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description:
1.2 Towns: **Winhall**
1.3 Downstream Latitude: **43.13993**
1.3 Downstream Longitude: **-72.91470**

Step 2. Stream Type

2.1 Elevation Upstream: **1,518**
2.1 Elevation Downstream: **1,437**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **6,467.0** ft. **1.22** Miles
2.3 Valley Slope: **1.3**
2.4 Channel Length: **6,952.0** ft. **1.32** Miles
2.5 Channel Slope: **1.17 %**
2.6 Sinuosity: **1.07**
2.7 Watershed Area: **20.2** Square Miles
2.8 Channel Width: **49.2** feet
2.9 Valley Width: **632.0** feet
2.10 Confinement Ratio: **12.8**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Braided**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Other** **75.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Steep**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **Not Rated** **75.0** %
Flooding: **Frequent** **88.0** %
Water Table Deep: **2.5** **14.0** %
Water Table Shallow: **1.5** **14.0** %
Erodibility: **slight** **10.0** %
7.4 Comments: 1

Bank heights 2- 8 ft. observed along with 20-30 ft. of erosion.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **93.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **61.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**229.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **0.9** %
5.3 Bank Armoring: **71.6** **1.0** %
Left: **41.5** ft. Right: **30.1** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,196.7** ft. **17.2**

	One Side	Both Sides
Road:	**586.4** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	**1,196.7** ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **No Data**
6.5 Meander Width: **49 ft.** Rato: **1.0**
6.6 Wavelength: **49 ft.** Ratio: **1.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **1660.3652344** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	0 N.S.	2 High	2 High	2 High	2 High	13

Page:163

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:43:08

Please add note do describe P2 segmentation and stream types as they relate to reference

Author: Joe Date: 2024-12-06 16:47:01

Completed set by Joe

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-A**
Segment Length(ft): **4,921**
Rain: **Yes**
Segment Version: Base

SGAT Version: **4.53**
Organization: **Bear Creek Environmental**
Observers: **MB, AM**
Completion Date: **8/5/2013**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Just downstream of Lightfoot Camp Rd crossing, along Kendall Farm Rd**

Step 5 - Notes: **Most likely braided by reference due to change in slope and alluvial fan conditions. Aggradation and braided bedform exacerbated by TSI. Debris that came down from TSI is also contributing to the braided condition.**

Step 7 - Narrative: **FIV-->FV**
C4 Braided riffle pool channel. Likely a historic incision but active aggradation and planform is supporting a new healthy floodplain. Multiple avulsions and braiding through multiple channels likely the result in a slope and confinement change. Historic photos may support that this is an alluvial active area.

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**
1.2 Alluvial Fan: **None**
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		0	5	0	3
Road:		0	10	0	
Railroad:		0		0	
Imp. Path:		0		0	0
Dev.:		0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	N.E.	N.E.

1.5 Valley Features
Valley Width (ft): **690**
Width Determination: **Measured**
Confinement Type: **VB**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls: **None**

Stream: **Winhall River** Reach: **T11.08-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**68.50**	2.11 Riffle/Step Spacing:	**258.4 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.30**	2.12 Substrate Composition		Bed:	**8**	**inches**
2.3 Mean Depth (tf):	**1.90**	Bedrock:	**0.0 %**	Bar:	**3.24**	**inches**
2.4 Floodprone Width (ft.):	**466.00**	Boulder:	**8.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.60**	Cobble:	**36.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**30.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**36.05**	Fine Gravel:	**15.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**6.80**	Sand:	**11.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.70**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**53**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Pasture**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: Winhall River Reach: T11.08-A

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Abundant**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments: **None**
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **Down Stream**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**
Field Ditch: Road Ditch:
Other: Tile Drain:
Overland Flow: Urb Strm Wtr Pipe:
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions: **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **8**
Mid: **3**
Delta: **0**
Point: **1**
Island: **0**
Side: **20**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **0**
Avulsion: **0**
5.3 Steep Riffles and Head Cuts
Head Cuts: **0**
Steep Riffles: **0**
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

1

Geomorphic Assessment Scores

		Score	STD (7.5)	Historic (7.5)
7.1	Channel Degradation	8	None	Yes
7.2	Channel Aggradation	3	None	No
7.3	Widening Channel	8	None	No
7.4	Change in Planform	3	None	No
	Total Score	22		
	Condition Rating	0.28		
7.5	Channel Evolution Model	F		
	Channel Evolution Stage	IV		
7.6	Geomorphic Stream Condition	Poor		
7.7	Stream Sensitivity	Very High		

7.5 **Channel Adjustment Processes Narrative**

FIV-->FV C4 Braided riffle pool channel. Likely a historic incision but active aggradation and planform is supporting a new healthy floodplain. Multiple avulsions and braiding through multiple channels likely the result in a slope and confinement change. Historic photos may support that this is an alluvial active area.

Number: 1 Author: Evelyn.Boardman Subject: Stamp Date: 2024-08-05 10:22:49

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-A**
Segment Length(ft): **4,274**
Rain: **No**
Segment Version: West Reassessment 2022

SGAT Version: **4.53**
Organization:
Observers: **JHB JWC**
Completion Date: **11/10/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **Just downstream of Lightfoot Camp Rd crossing, along Kendall Farm Rd**

Step 5 - Notes:

Step 7 - Narrative: **The reach shows signs of recent incision and active aggradation with very large cobble/gravel bars filling the widened channel. Many food chutes both active and recently abandoned were observed. The reach is in Stage III transitioning to Stage IV, with limited evidence of active erosion along the flood scoured banks.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **2**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		**201**	**5**		
Road:		**586**	**10**		
Railroad:					
Imp. Path:					
Dev.:					

1.4 Adjacent Side	Left	Right
Hillside Slope:	**Hilly**	**Steep**
Continuous w/ Bank:	**Never**	**Never**
Within 1 Bankfull W:	**Sometimes**	**Sometimes**
Texture:	**Mixed**	**Mixed**

1.5 Valley Features: **1**
Valley Width (ft): **550**
Width Determination: **Measured**
Confinement Type: **BD**
In Rock Gorge: **No**
Human Caused Change in Valley Width?: **No**

1.6 Grade Controls:

Page:167

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:09:50

Noted this is narrower than 2013 P2 and P1. Based on the meander patterns in the hillshade it looks like this could be wider. Was there something you saw in the field that suggests the valley wall mapping should be updated?

Author: Joe Subject: Joe Date: 2024-12-06 16:51:30

No change in the VW, Ours was mapped based on LiDAR and looks accurate.

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-08 10:36:45

Should this be considered an alluvial fan?

Author: Joe Subject: Joe Date: 2024-12-06 16:52:02

Added AF to FIT

Stream: **Winhall River** Reach: **T11.08-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**49.00**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.20**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.50**	Bedrock:	**0.0 %**	Bar:	**130**	**mm**
2.4 Floodprone Width (ft.):	**75.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**29.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**56.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**19.60**	Fine Gravel:	**5.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.53**	Sand:	**5.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.41**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**64**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**432.3**	**758.3**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.1**	**4.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:			Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**229**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Hay**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number		
Failures			Gullies Length		
Gullies					

Page:168

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:12:47

Was the cross section in a similar area to 2013? Comparing the 2013 and 2022 data. It appears 2013 used a floodprone width higher than what was shown in the cross section, but may have been representative of the broader reach. Bankfull width was much wider in the 2013 section (68.5 ft vs 49 ft).

Author: Evelyn.Boardman Subject: Sticky Note Date: 2024-08-06 10:31:39

Are there sections of this segment that are reference B as well as C? Has there been a departure since 2013?

Author: Joe Subject: Joe Date: 2024-12-06 16:55:35

I don't think we had the location of the 2013 XS so we selected a representative location. The reach is super active, I'm not surprised that it has changed, especially with the 2013 assessment being so close to TSI.

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-05 10:01:59

Has forest grown in more since 2013? 2013 data had herbaceous for dominant and open mid-channel canopy

Author: Joe Subject: Joe Date: 2024-12-06 16:53:24

Some increased forest growth, but probably more based on the time of year, we assessed in late fall.

Phase 2 Segment Summary Report — West River

Stream: **Winhall River** Reach: **T11.08-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**61**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	
		(old) Upstrm Flow Reg.:		Affected Length (ft):	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other		**No**	**No**	**No**	**No**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	**5**	5.2 Other Features	Neck Cutoff:		5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**5**	Delta:	Flood chutes:	**10**	Avulsion:	**3**	5.5 Straightening:	2	**None**
Point:	**2**	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:		Straightening Length (ft.):		**0**
Side:	**16**	Braiding:	**1**	Steep Riffles:	**3**	Trib Rejuv.:	**No**	5.5 Dredging:	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**C to B**	**No**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Page:169

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-05 10:14:55

Interesting there were 6 debris jams vs. 0 in 2013 (unless this is a relic of various SGA versions). Do you think wood source is in the segment from new channel adjustment or upstream?

Author: Joe Subject: Joe Date: 2024-12-06 16:56:17

I am skeptical that there were no debris jams in 2013, probably a relic?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:16:10

Do you think there is evidence of straightening or dredging in the reach? It looks like in addition to the mapped berm, there is another to the north of it in the floodplain, and possibly one south of the channel based on the hillshade.

Author: Joe Subject: Joe Date: 2024-12-06 16:57:18

There are some old berms on abandoned channels visible, I don't think we missed anything on active channels.

Phase 2 Segment Summary Report West River

Stream: Winhall River
Reach: T11.08-B
Segment Length(ft): 2,031
Rain: No
Segment Version: Base

SGAT Version: 4.53
Organization: Bear Creek Environmental
Observers: MB, AM BCE
Completion Date: 8/5/2013
Qualtiy Control Status - Consultant: Provisional
Qualtiy Control Status - Staff: Provisional

Step 0 - Location: **upstream of Lightfoot Camp Rd crossing**

Step 5 - Notes: **Cross sectional area was 86% of the regional curve. If the bankfull elevation was raised to be closer to the curve, it would change the stream type to be more of an "F" channel. The benches, pools, and floodplain outlets warrant this segment to be a C to B departure and not a C to F.**

Step 7 - Narrative: **Historic incision but berming and road fill are mostly responsible for incision and entrenchment. Looks like stream may have accessed wetland to north. Re-routing road would be good project. Significant widening and aggradation and planform along with stream power at this slope (~1.3%) could yield a volatile reach.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Planform and Scope**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0	3		0	3
Road:	0			0	
Railroad:	0			0	
Imp. Path:	0	4		0	
Dev.:	0			0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Very Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Never	Sometimes
Texture:	N.E.	N.E.

1.5 Valley Features

Valley Width (ft): 455
Width Determination: Measured
Confinement Type: BD
In Rock Gorge: No
Human Caused Change in Valley Width?: Yes

1.6 Grade Controls: None

Stream: **Winhall River** Reach: **T11.08-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**59.00**	2.11 Riffle/Step Spacing:	**280 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**14.4**	**inches**
2.3 Mean Depth (tf):	**1.72**	Bedrock:	**1.0 %**	Bar:	**5.1**	**inches**
2.4 Floodprone Width (ft.):	**80.50**	Boulder:	**30.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.40**	Cobble:	**28.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):	**7.30**	Coarse Gravel:	**22.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**34.30**	Fine Gravel:	**14.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.36**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.57**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	**1.27**	
Human Elevated Inc. Rat.:	**2.61**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**11**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:	**None**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**51-75**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Shrubs/Sapling**	**Mixed Trees**
Sub-Dominant	**Mixed Trees**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Winhall River** Reach: **T11.08-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Minimal**
4.2 Adjacent Wetlands: **Abundant**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type
Flow Reg. Use:
Impoundments: **None**
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **Down Stream**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **0**
Other: **0** Tile Drain: **0**
Overland Flow: **3** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**60**	**Yes**	**Yes**	**No**	**Yes**	**Scour Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Diagonal: **2**
Mid: **4**
Delta: **0**
Point: **0**
Island: **0**
Side: **12**
Braiding: **0**

5.2 Other Features
Neck Cutoff: **0**
Flood chutes: **0**
Avulsion: **0**

5.3 Steep Riffles and Head Cuts
Head Cuts: **0**
Steep Riffles: **0**
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

1

Geomorphic Assessment Scores

		Score	STD (7.5)	Historic (7.5)
7.1	**Channel Degradation**	5	C to B	Yes
7.2	**Channel Aggradation**	13	None	No
7.3	**Widening Channel**	8	None	No
7.4	**Change in Planform**	11	None	No
	Total Score	37		
	Condition Rating	0.46		
7.5	**Channel Evolution Model**	F		
	Channel Evolution Stage	III		
7.6	**Geomorphic Stream Condition**	Fair		
7.7	**Stream Sensitivity**	Very High		

7.5 **Channel Adjustment Processes Narrative**

Historic incision but berming and road fill are mostly responsible for incision and entrenchment. Looks like stream may have accessed wetland to north. Re-routing road would be good project. Significant widening and aggradation and planform along with stream power at this slope (~1.3%) could yield a volatile reach.

Number: 1 Author: Evelyn.Boardman Subject: Stamp Date: 2024-08-06 10:40:46

Phase 2 Segment Summary Report West River

Stream: **Winhall River**
Reach: **T11.08-B**
Segment Length(ft): **2,678**
Rain: **No**
Segment Version: West Reassessment 2022

SGAT Version: **4.53**
Organization:
Observers: **JHB JWC**
Completion Date: **11/10/2022**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**

Step 0 - Location: **upstream of Lightfoot Camp Rd crossing**

Step 5 - Notes:

Step 7 - Narrative: **The channel is moderately incised with evidence that incision was recent and may be ongoing during large flow events. The channel is overwidened and filling with coarse sediment deposits along the sides. Much less mid channel accumulation than downstream.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**
1.2 Alluvial Fan:
1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:		256	3		
Road:					
Railroad:					
Imp. Path:		1,197	4		
Dev.:					

1.4 Adjacent Side

	Left	Right
Hillside Slope:	**Hilly**	**Very Steep**
Continuous w/ Bank:	**Never**	**Sometimes**
Within 1 Bankfull W:	**Never**	**Sometimes**
Texture:	**Cobble**	**Cobble**

1.5 Valley Features

Valley Width (ft):	**400**
Width Determination:	**Measured**
Confinement Type:	**BD**
In Rock Gorge:	**No**
Human Caused Change in Valley Width?:	**No** 1

1.6 Grade Controls:

Page:173

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:33:47

Noted in 2013 data this is "Yes". Is the path/road affecting the valley width?

Author: Joe Date: 2024-12-09 15:36:48

Completed set by Joe

Stream: **Winhall River** Reach: **T11.08-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**55.30**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**700**	**mm**
2.3 Mean Depth (tf):	**2.03**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**39.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.20**	Cobble:	**20.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.): 1		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**27.24**	Fine Gravel:	**10.0 %**	Subclass Slope:		
2.7 Entrenchment Ratio:	**1.45**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.79** 2	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**8.0 %**	Reference Stream Type:	**B** 3	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**4**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Undercut**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**48.7**	**421.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**	Erosion Height (ft.):	**2.0**	**3.8**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**41.5**	**30.1**	Canopy %:	**76-100**	**76-100**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**Residential**		Height		
(Legacy)	Amount	Mean Hieght	Gullies Number		
Failures			Gullies Length		
Gullies					

Page:174

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-13 14:25:19

Should there be a human elevated RAF/IR as in the 2013 data to account for the berm?

Author: Joe Date: 2024-12-09 15:49:37

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-09 15:49:34

I added a 1ft elevated RAF for the berm

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-13 14:26:05

2013 and 2024 cross sections very similar, including max depth and height of the berm. The 2013 section records a lower RAF and a lower floodplain behind the berm, perhaps explaining the assessment of reference C and lower IR. Please verify or make a note as needed describing the choice of the RAF height.

Author: Joe Subject: Joe Date: 2024-12-09 15:50:17

I did several LiDAR slices and they are consistent aligned with our elevation for the RAF

Number: 3 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:41:56

Do you think this reach is primarily reference B? By comparison, in 2013 this was noted as a departure from C to B. Please add notes to discuss choice.

Author: Joe Date: 2024-12-09 15:51:01

Completed set by Joe

Author: Joe Subject: Joe Date: 2024-12-09 15:51:19

I agree with the 2013 Assessment, updated to C-B

Phase 2 Segment Summary Report — West River

Stream: **Winhall River** Reach: **T11.08-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type		4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**4**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:		Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:		4.9 # of Beaver Dams:			
		(old) Upstrm Flow Reg.:		Affected Length (ft):			

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**60**	**Yes**	**Yes**	**No**	**Yes**	**Scour Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types	Diagonal:	5.2 Other Features		Neck Cutoff:		5.4 Stream Ford or Animal Crossing:	**No**
Mid: **2**	Delta:	Flood chutes:	**1**	Avulsion:		5.5 Straightening:	**None**
Point:	Island:	5.3 Steep Riffles and Head Cuts		Head Cuts:		Straightening Length (ft.):	**0**
Side: **4**	Braiding:	Steep Riffles:		Trib Rejuv.:	**No**	5.5 Dredging:	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11** 1	**None**	**No**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8** 2	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Page:175

Number: 1 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:38:56

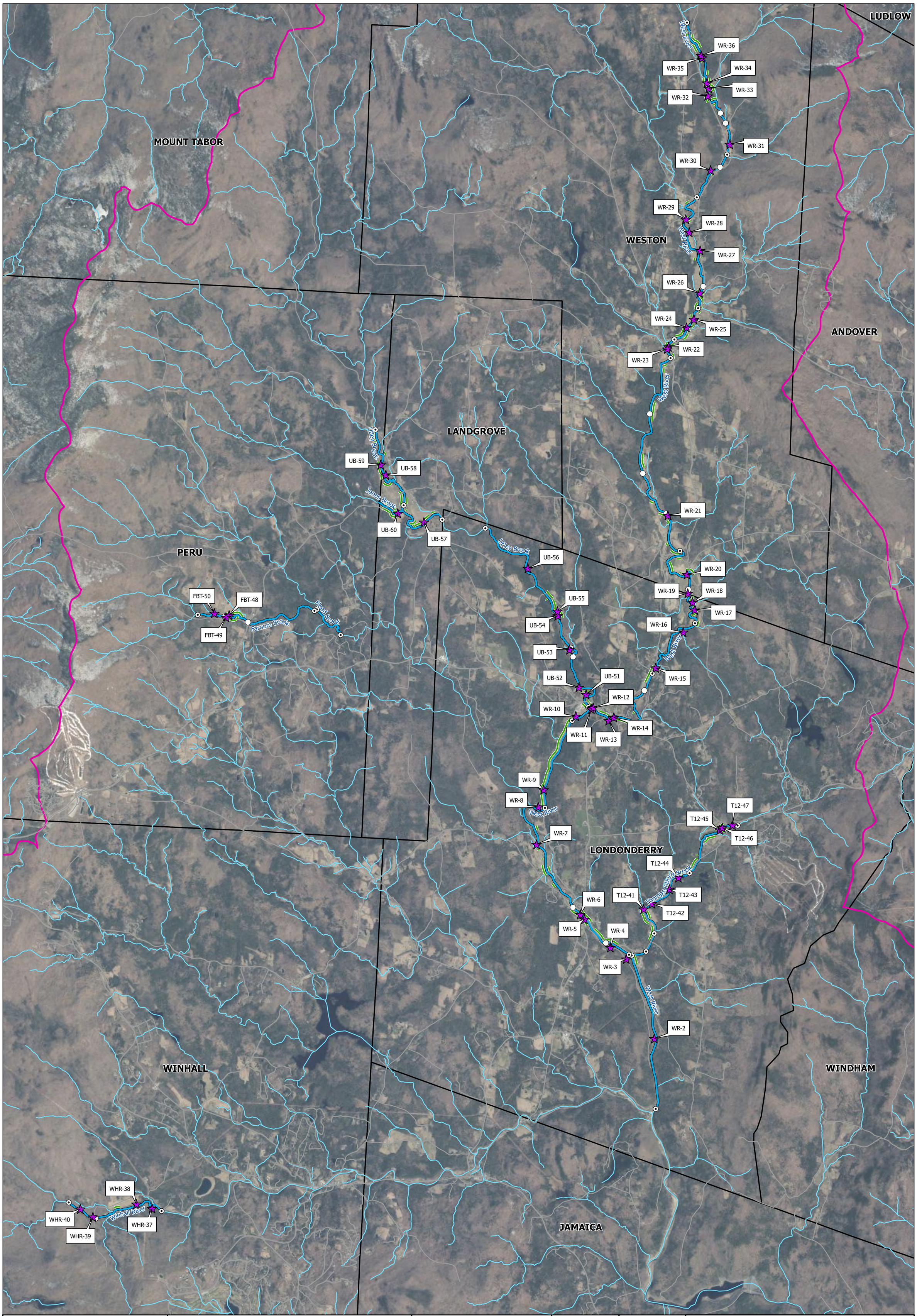
Should row 2 be poor for ER < 2?

Number: 2 Author: Evelyn.Boardman Subject: Highlight Date: 2024-08-06 10:38:38

Should row 3 be poor for ER < 2?

APPENDIX D**:**

Reach Stressor and Project ID Maps



Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Riparian Buffer and Potential Project Map

West River

Stream Geomorphic Assessment

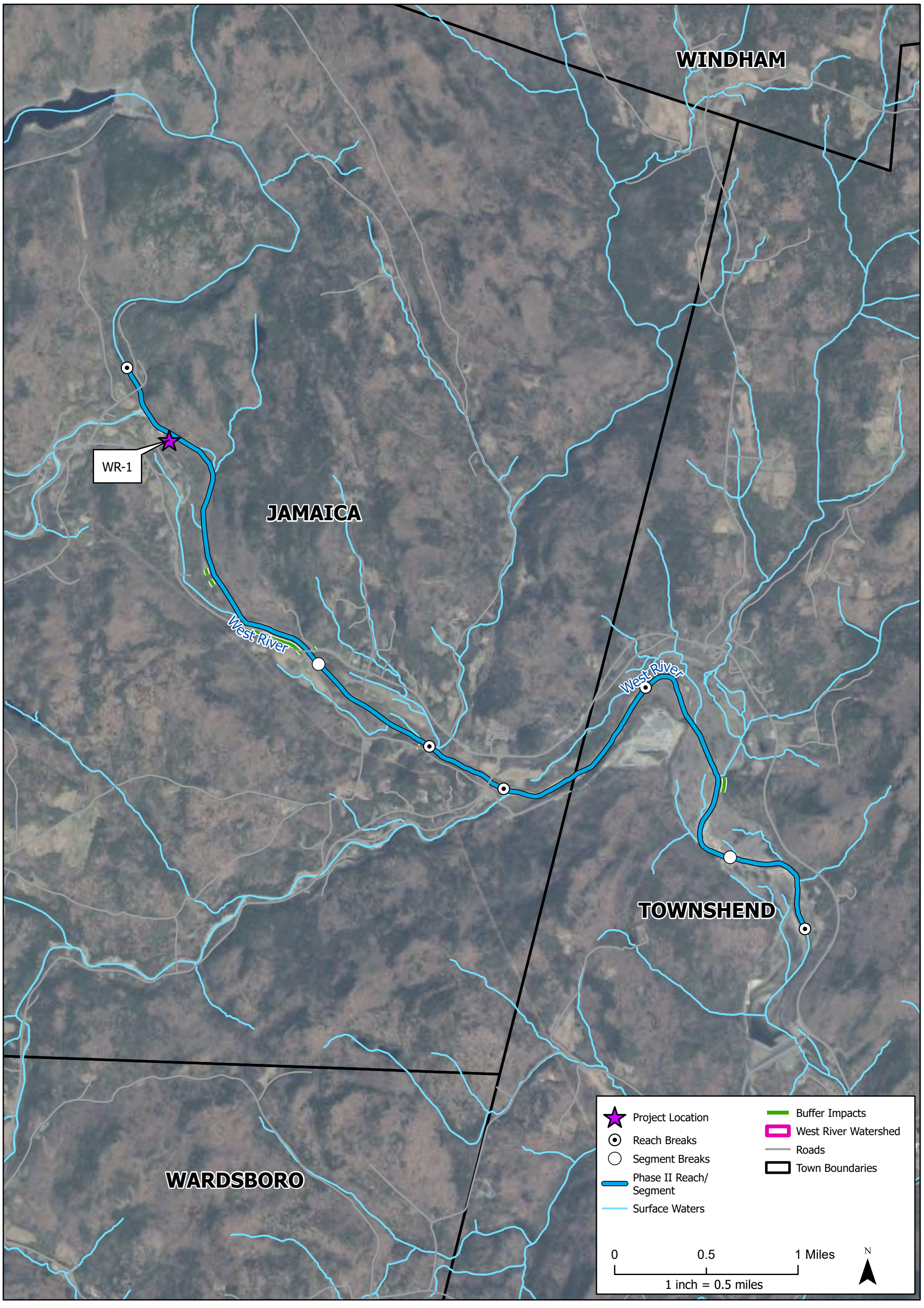
Notes:
-Stream geomorphic assessment conducted in Summer/Fall of 2022

JWC (DRAWN)	1 inch = 0.5 miles (SCALE)
JHB (CHECKED)	22012 (PROJ. NUMBER)
May 5, 2025 (DATE)	SHEET 1 (SHEET NO.)

Project Location
Reach Breaks
Segment Breaks
Phase II Reach/ Segment
Surface Waters
Buffer Impacts
West River Watershed
Roads
Town Boundaries

0 0.5 1 1.5 2 Miles

N



JWC (MAP BY)	JHB (CHECKED)	**Riparian Buffer and Potential Project Map** West River Stream Geomorphic Assessment	Notes: -Stream geomorphic assessment conducted in Summer/Fall of 2022	Fitzgerald Environmental Associates, LLC **164 Main Street, Suite 2** **Colchester, VT 05446** **Telephone: 802.876.7778** www.fitzgeraldenvironmental.com
1 inch = 0.5 miles (SCALE)				
May 5, 2025 (DATE)				
SHEET 2 (SHEET NO.)				

Appendix D

Map: 1

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 2

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 3

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 4

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 5

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 6

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 7

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 8

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 9

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 10

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 11

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 12

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 13

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 14

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 15

Reach Stressors and Project Identification

17

16

15

14

WR-1

R13B

MEADOWS RD

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 16

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 17

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 18

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 19

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 20

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 21

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 22

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 23

Reach Stressors and Project Identification

WR-3

24

R19

W RIVER ST

ROWES RD

23

22

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

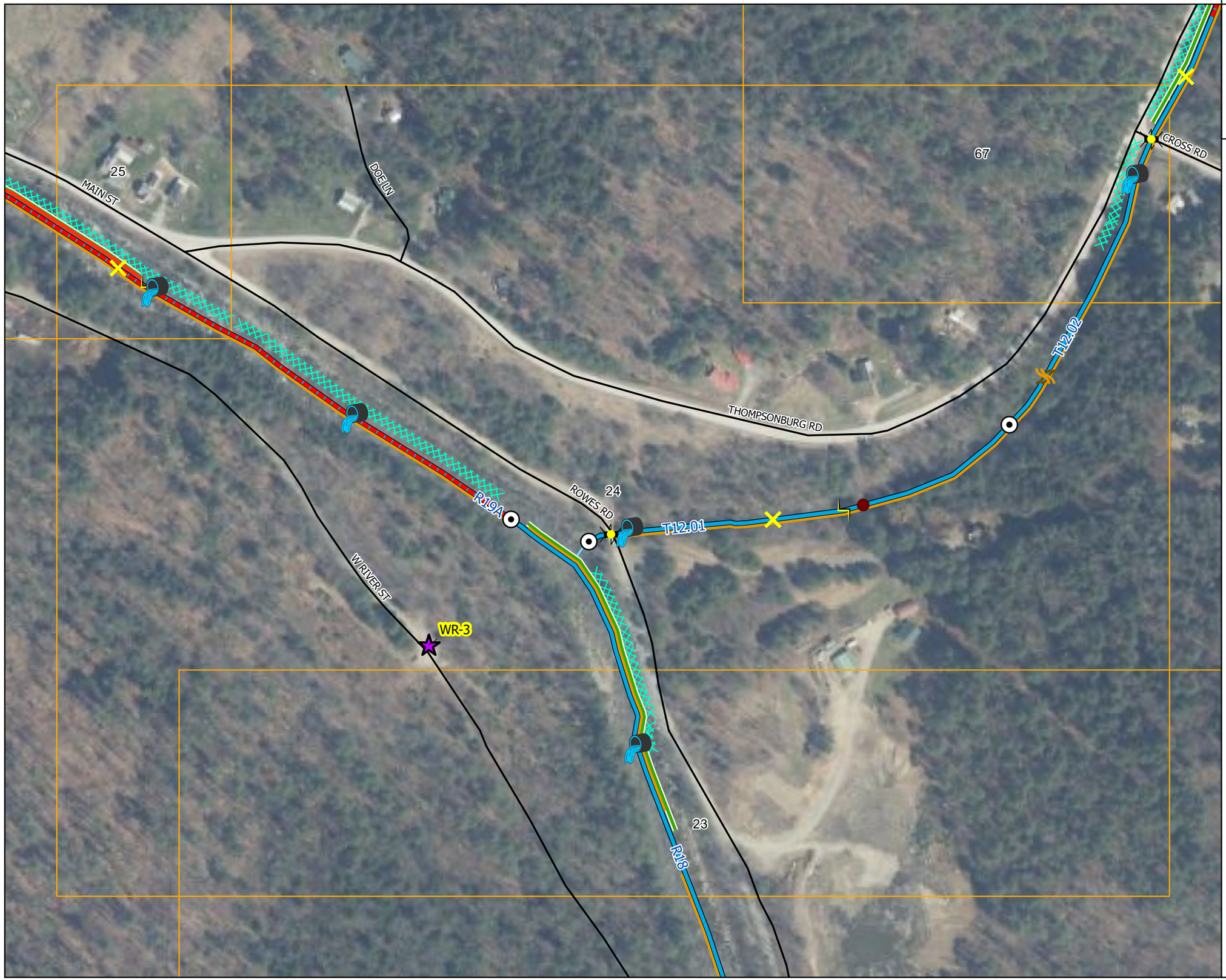
N

0 250 500 Feet

Appendix D

Map: 24

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

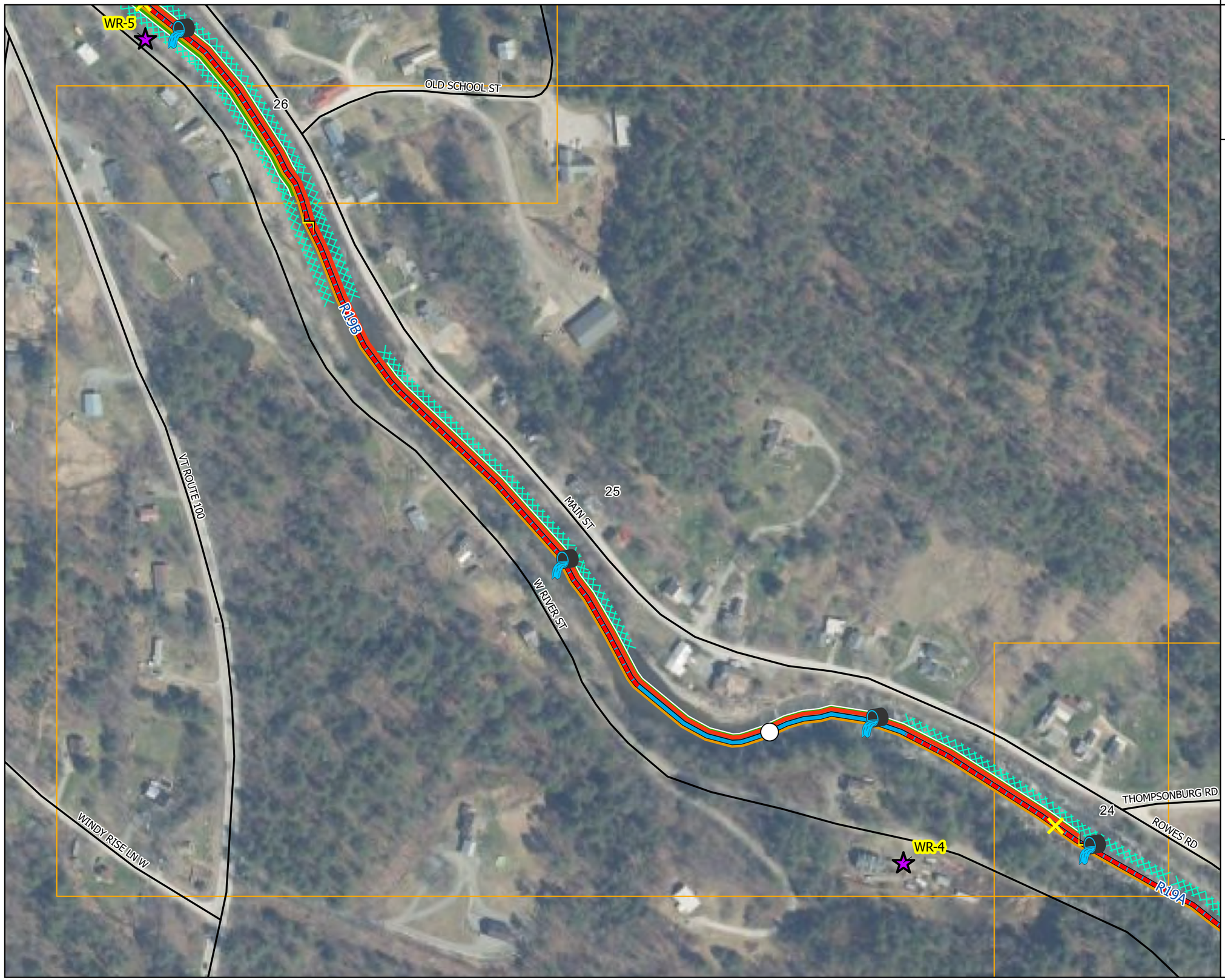
N

0 250 500 Feet

Appendix D

Map: 25

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 26

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 27

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 28

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 29

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 30

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet



Appendix D

Map: 31

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

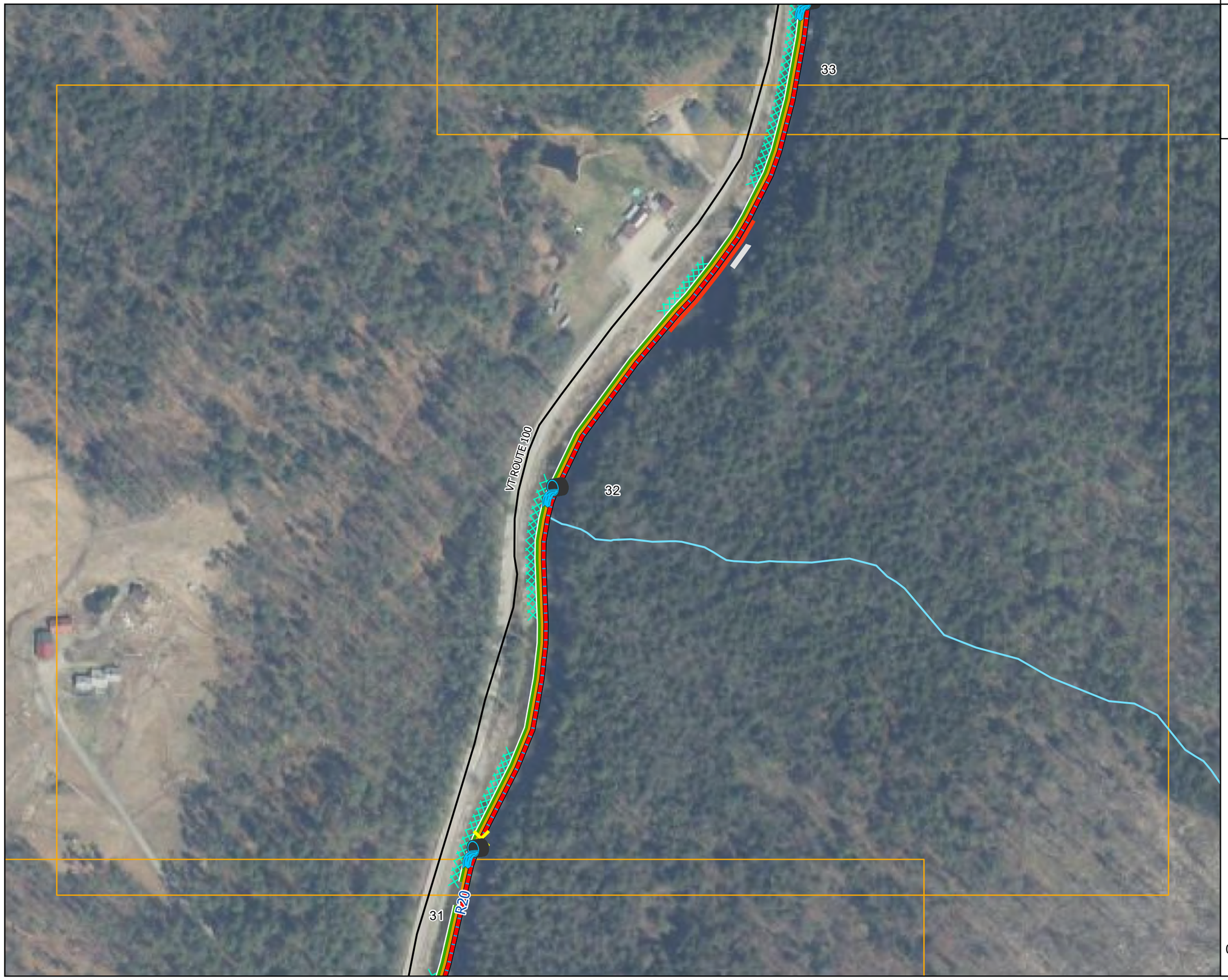
N

0 250 500 Feet

Appendix D

Map: 32

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

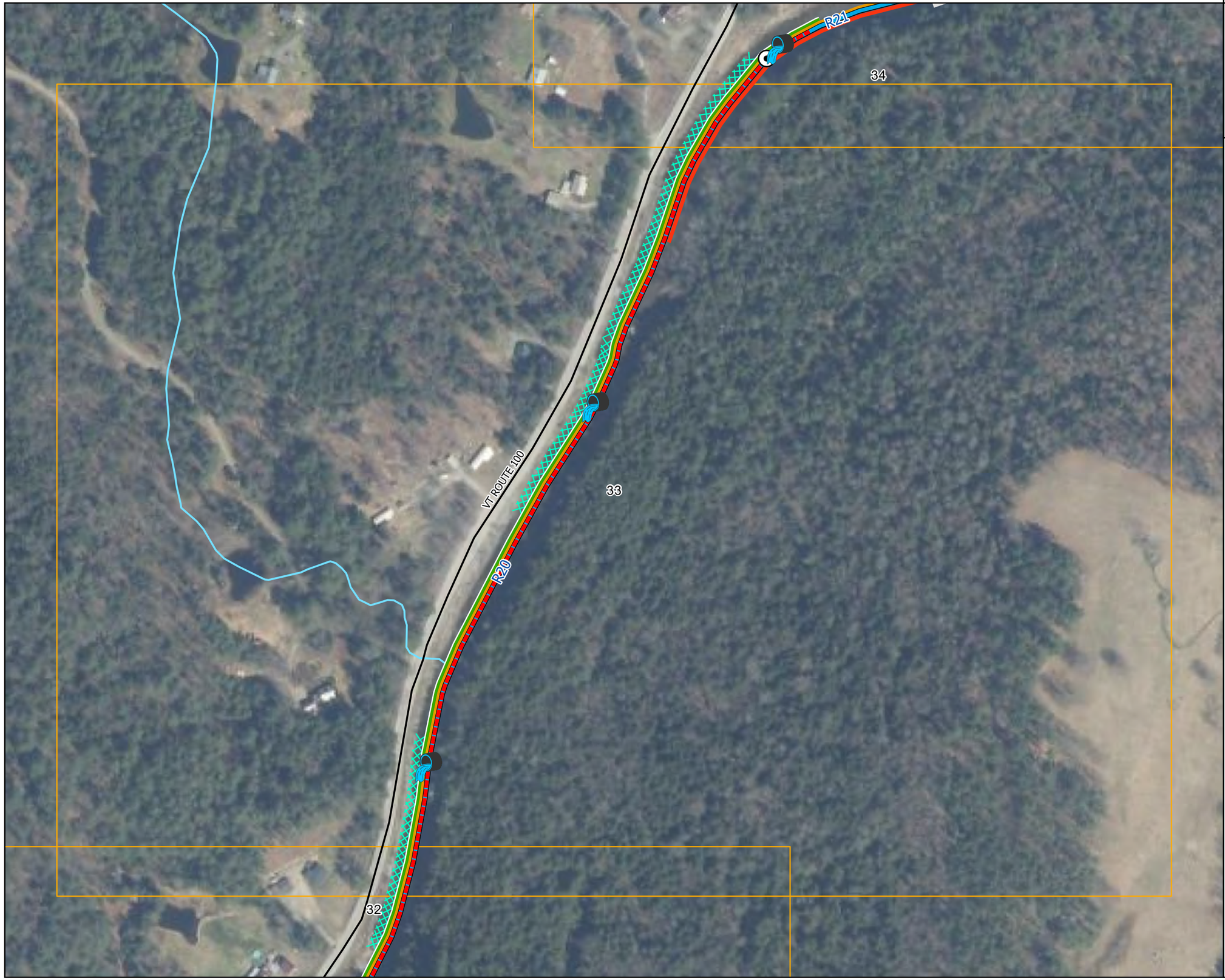
N

0 250 500 Feet

Appendix D

Map: 33

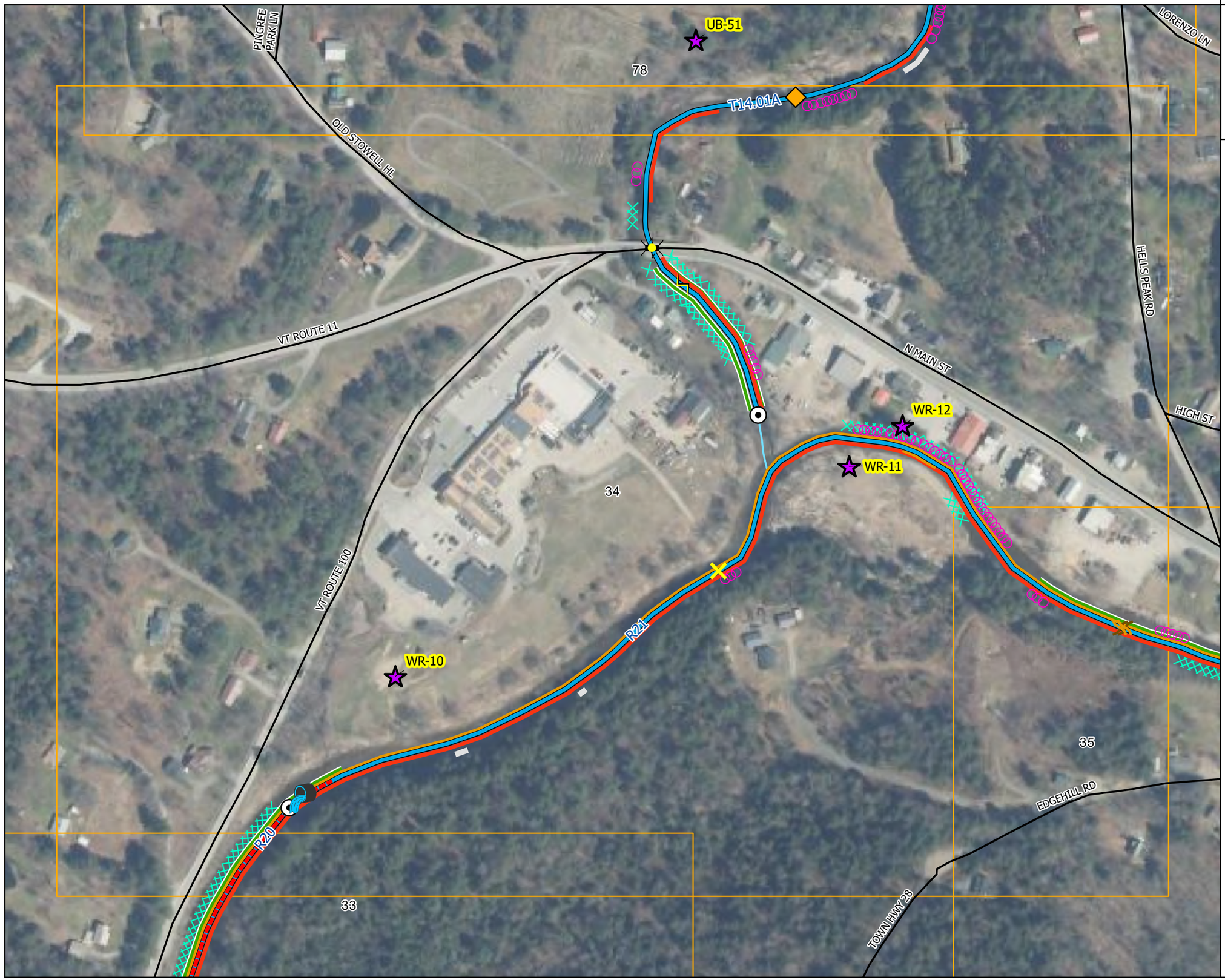
Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet



Appendix D

Map: 34

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 35

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

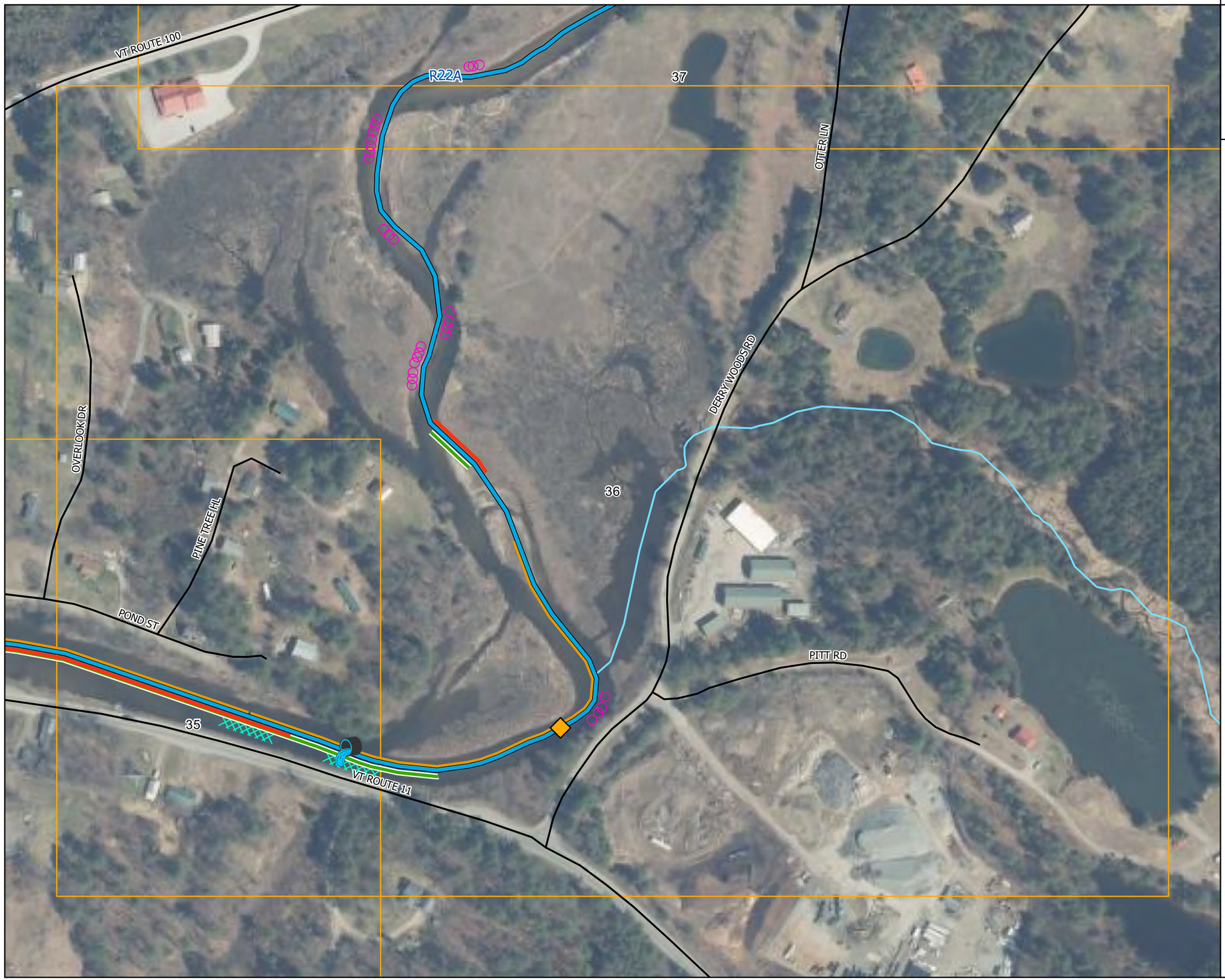
N

0 250 500 Feet

Appendix D

Map: 36

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 37

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

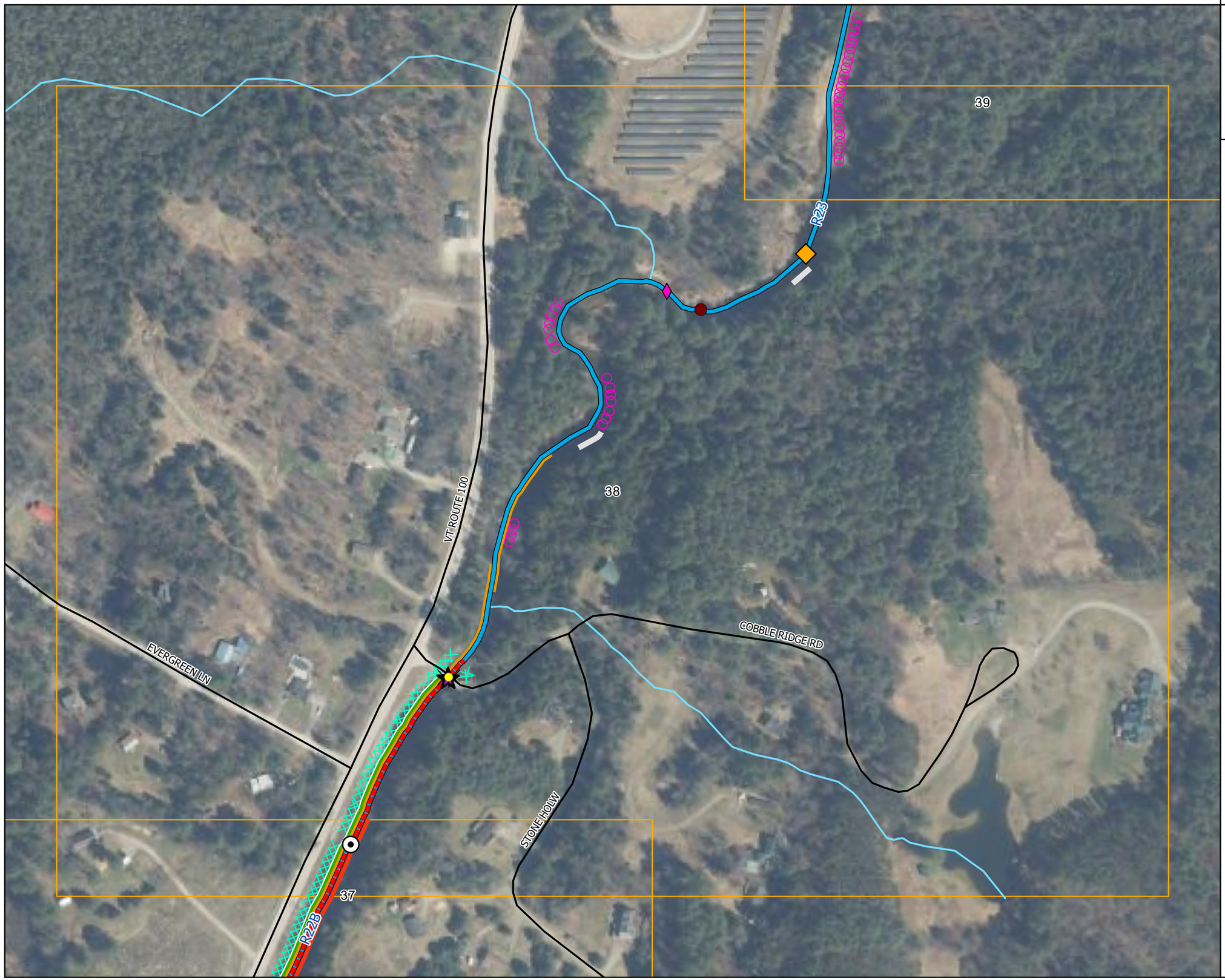
N

0 250 500 Feet

Appendix D

Map: 38

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

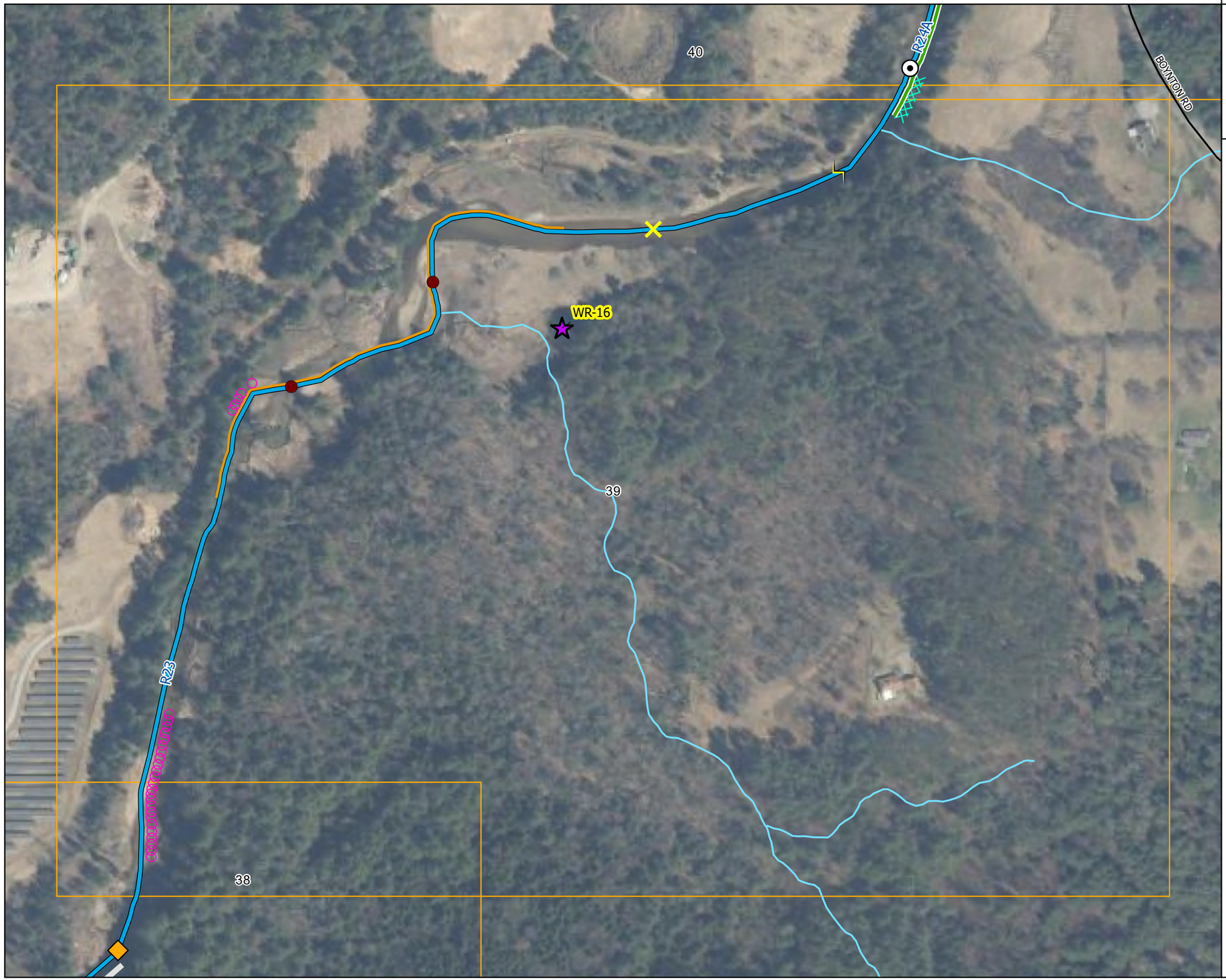
N

0 250 500 Feet

Appendix D

Map: 39

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 40

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 41

Reach Stressors and Project Identification

42

41

40

WOODCOCK LN

VT ROUTE 100

BOYNTON RD

WR-20

WR-19

R24B

R24A

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 42

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 43

Reach Stressors and Project Identification

WR-21

44

43

42

R25A

JOHNSON HILL RD

VT ROUTE 100

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 44

Reach Stressors and Project Identification

45

44

43

R25B

R25A

WR-21

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 45

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 46

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 47

Reach Stressors and Project Identification

48

R25D

47

R25C

46

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 48

Reach Stressors and Project Identification

49

48

47

R25D

R25C

VT ROUTE 100

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

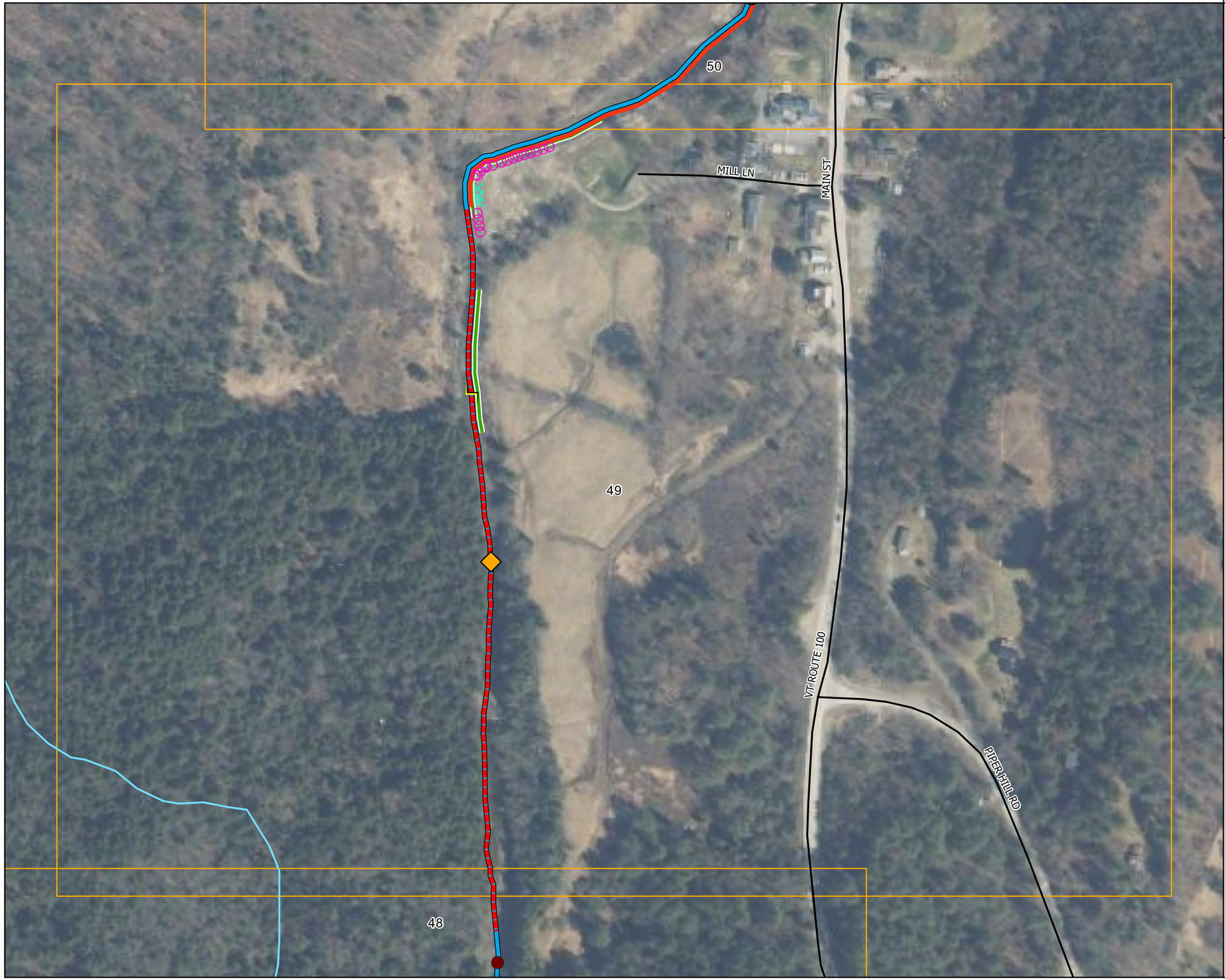
N

0 250 500 Feet

Appendix D

Map: 49

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

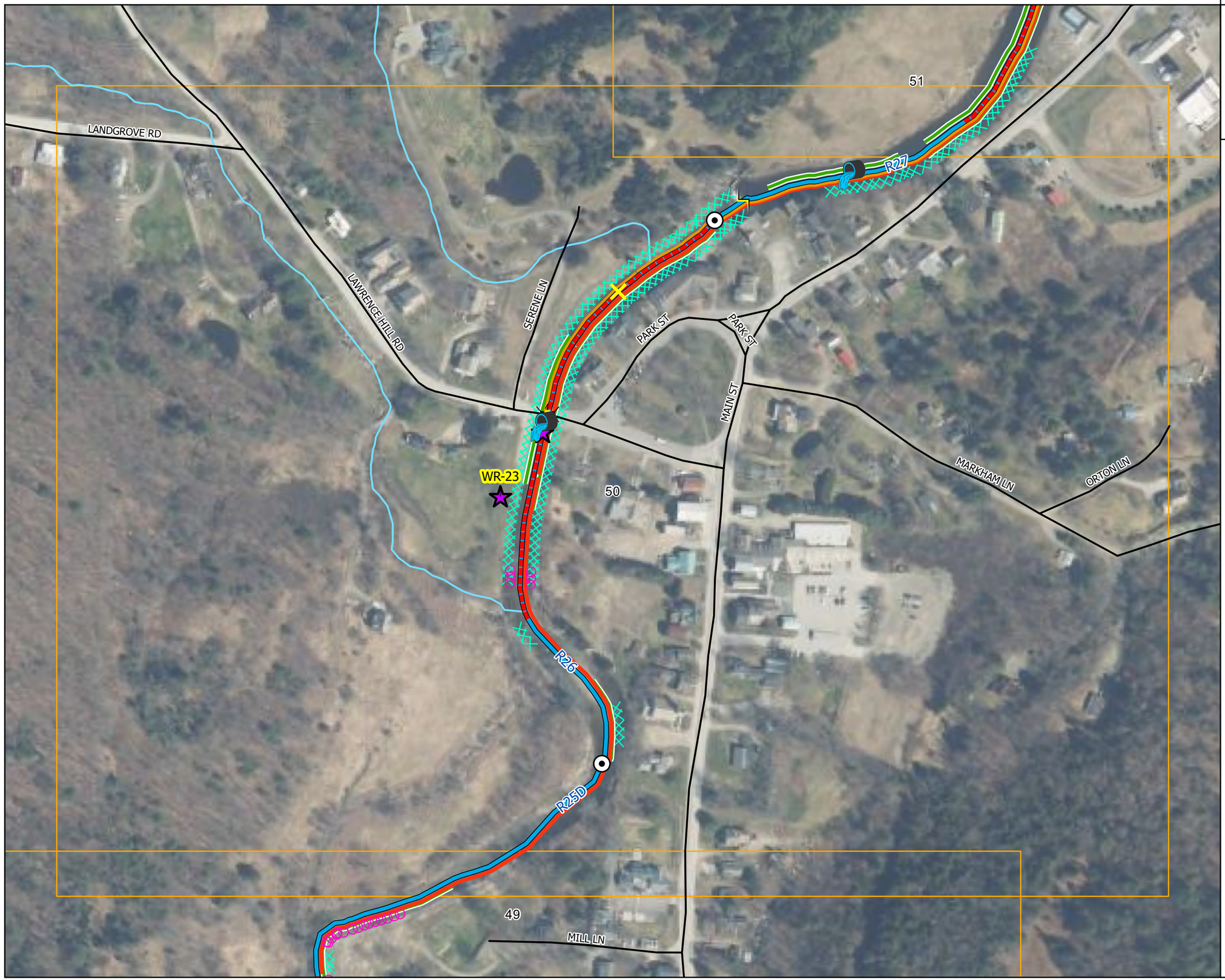
N

0 250 500 Feet

Appendix D

Map: 50

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 51

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 52

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 53

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 54

Reach Stressors and Project Identification

55

WR-28

R28B

54

MAPLE HILL RD

VT ROUTE 100

WR-27

53

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 55

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 56

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 57

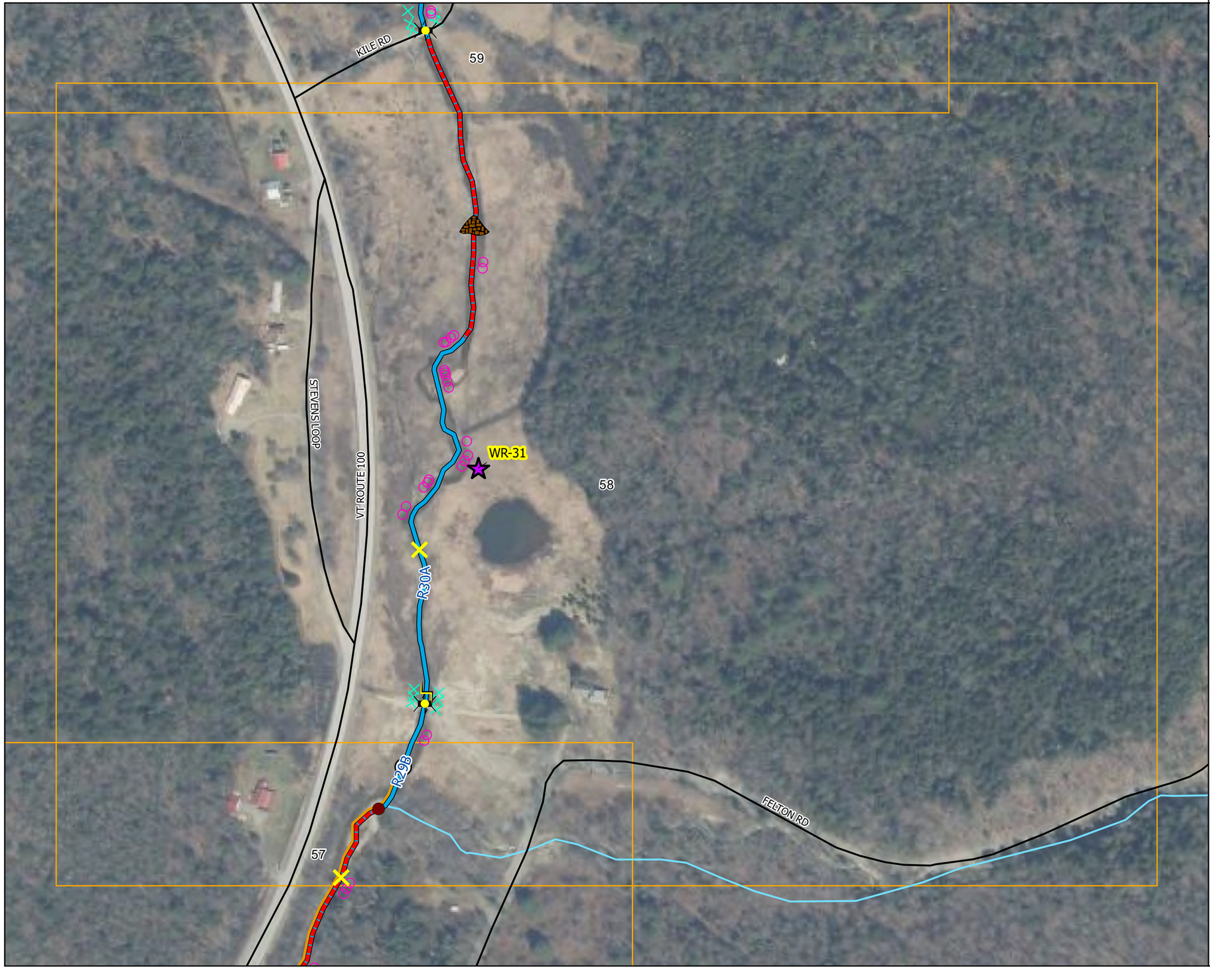
Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet



Appendix D

Map: 58

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 59

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 60

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

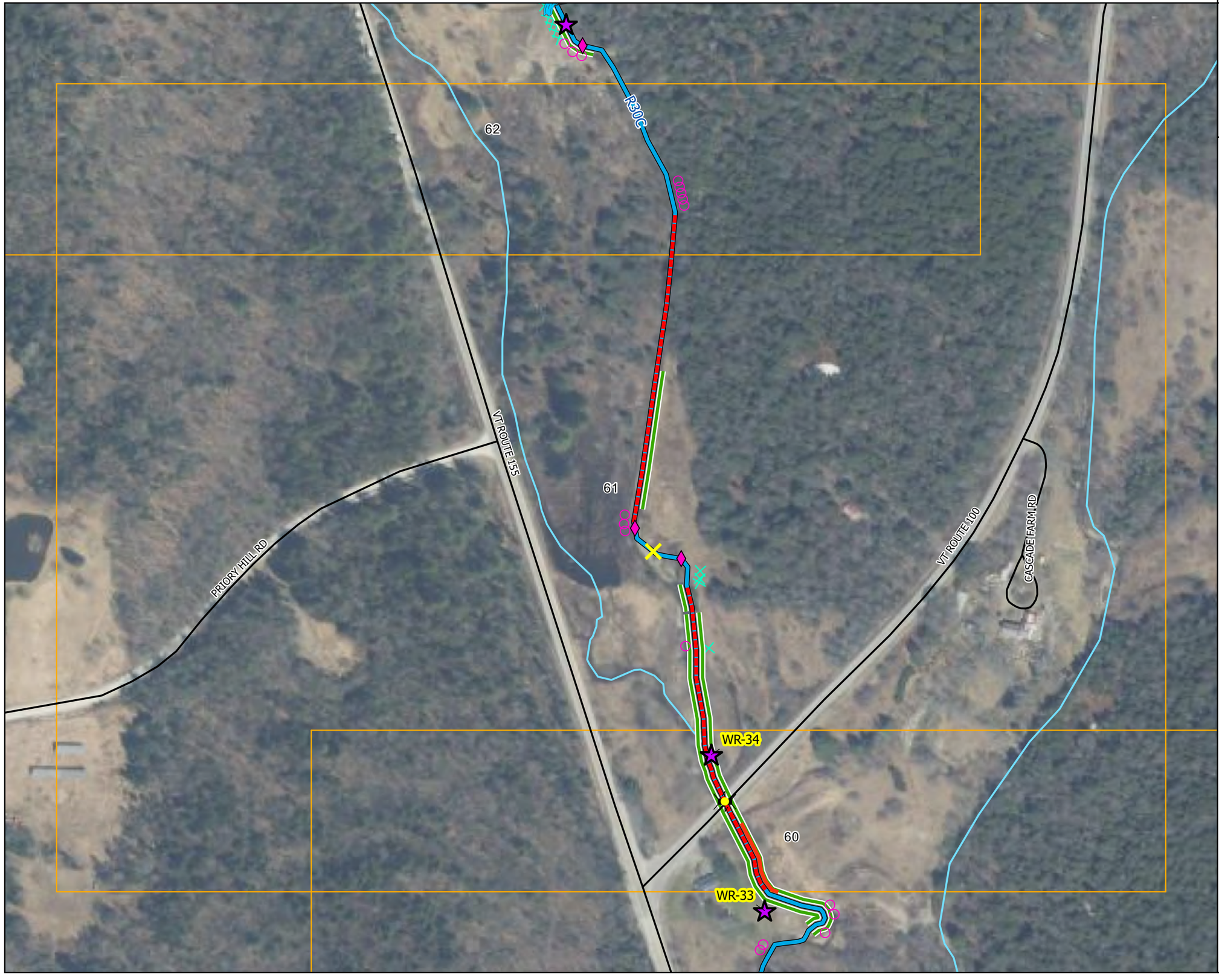
N

0 250 500 Feet

Appendix D

Map: 61

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

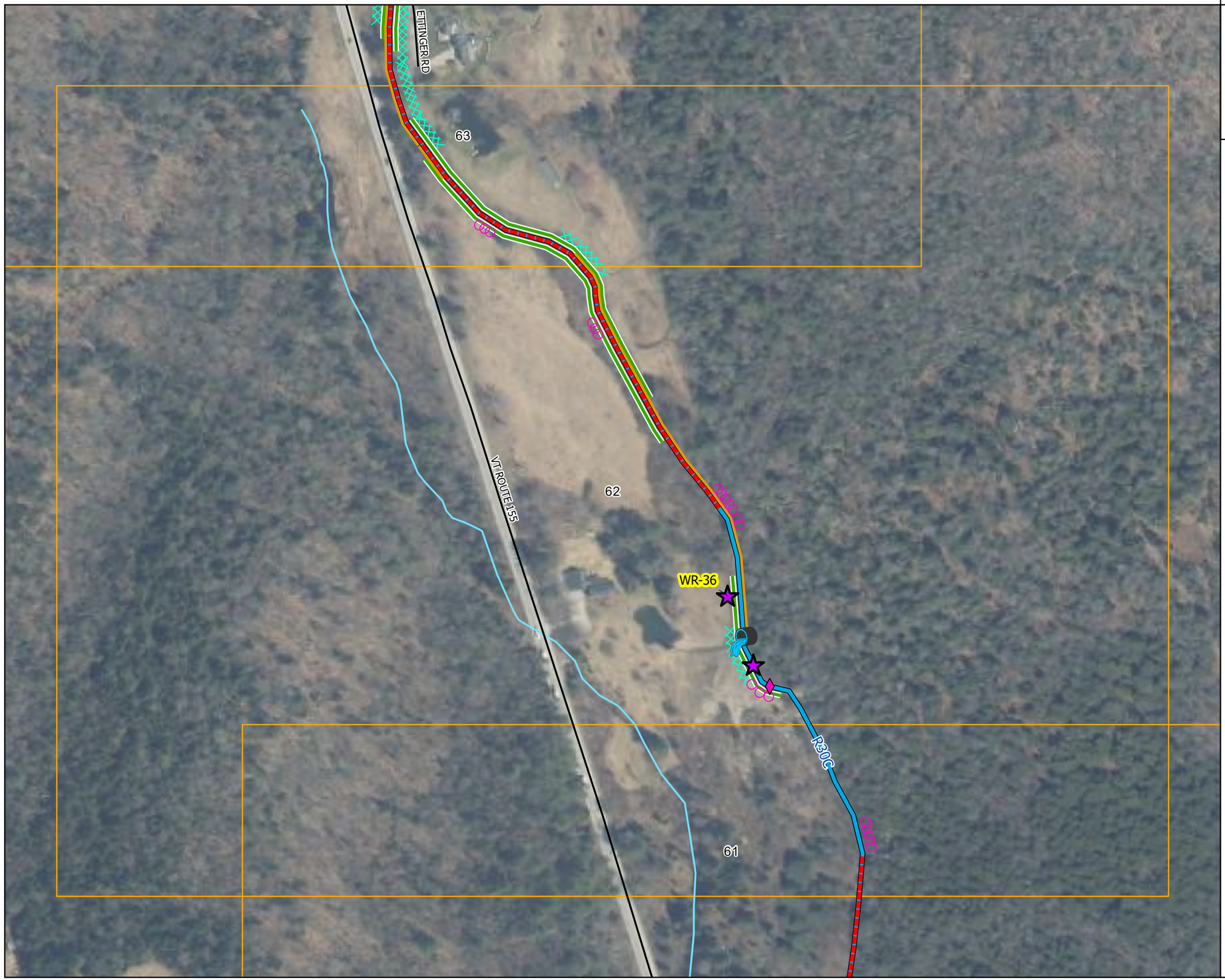
N

0 250 500 Feet

Appendix D

Map: 62

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 63

Reach Stressors and Project Identification

R30C

SHATTUCK RD

VT ROUTE 155

63

ETTINGER RD

62

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 64

Reach Stressors and Project Identification

BLACKCHERRY RIDGE RD

KENDALL FARM RD

HUNKER RD

WHR-38

WHR-37

T11 08A

64

65

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 65

Reach Stressors and Project Identification

KENDALL FARM RD

LIGHTFOOT CAMP RD

WHR-39

T11-08B

T11-08A

66

65

64

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

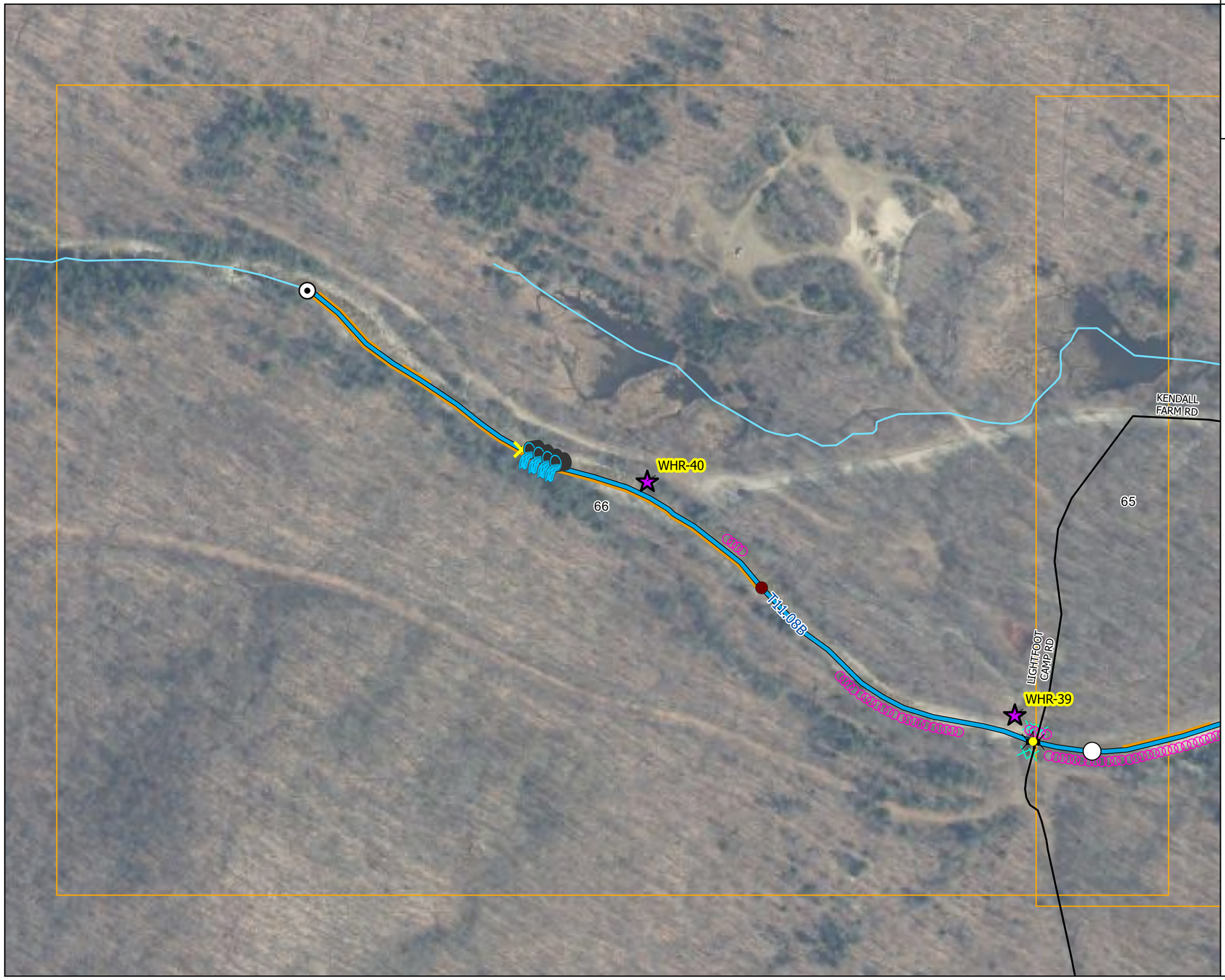
N

0 250 500 Feet

Appendix D

Map: 66

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 67

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

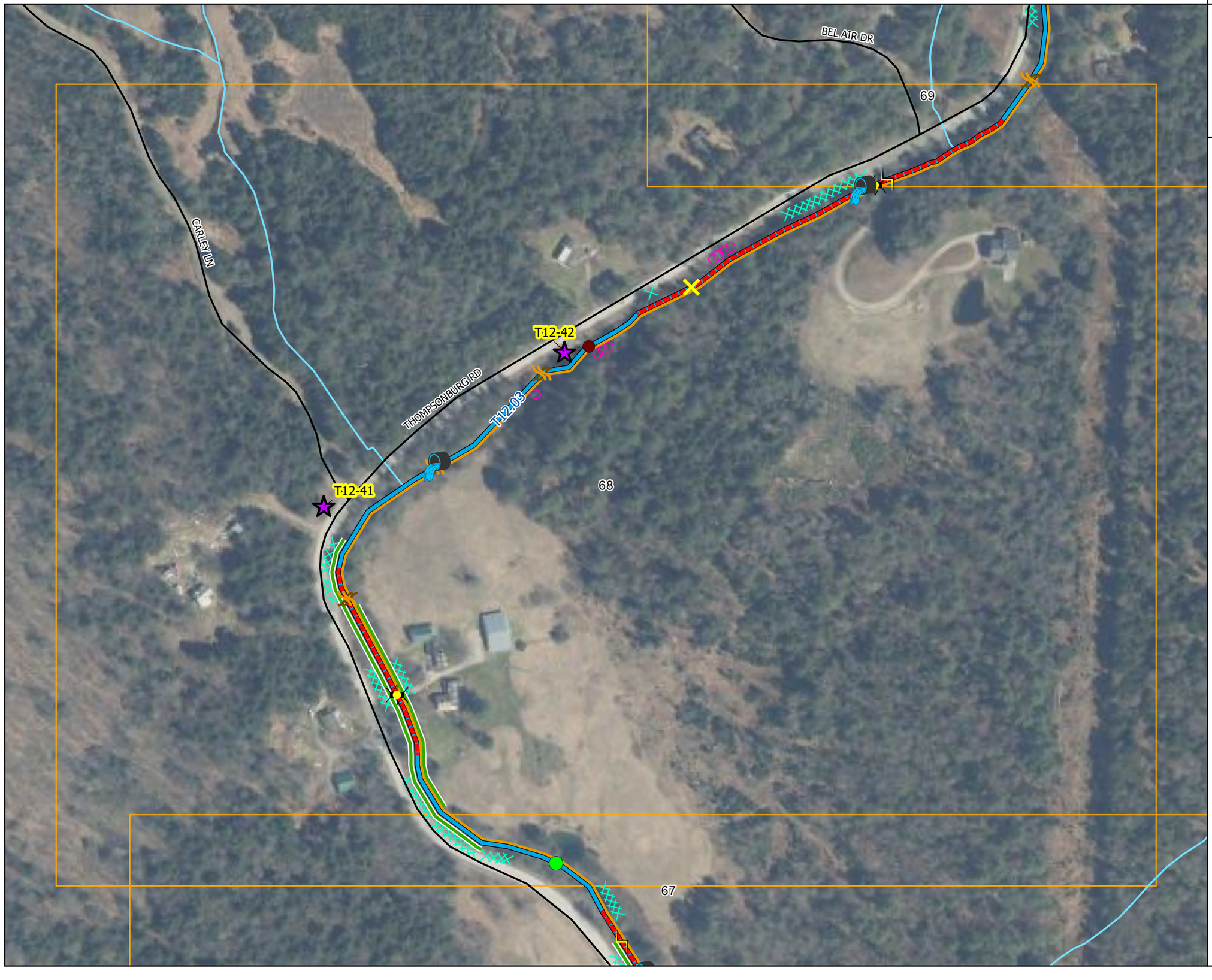
N

0 250 500 Feet

Appendix D

Map: 68

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

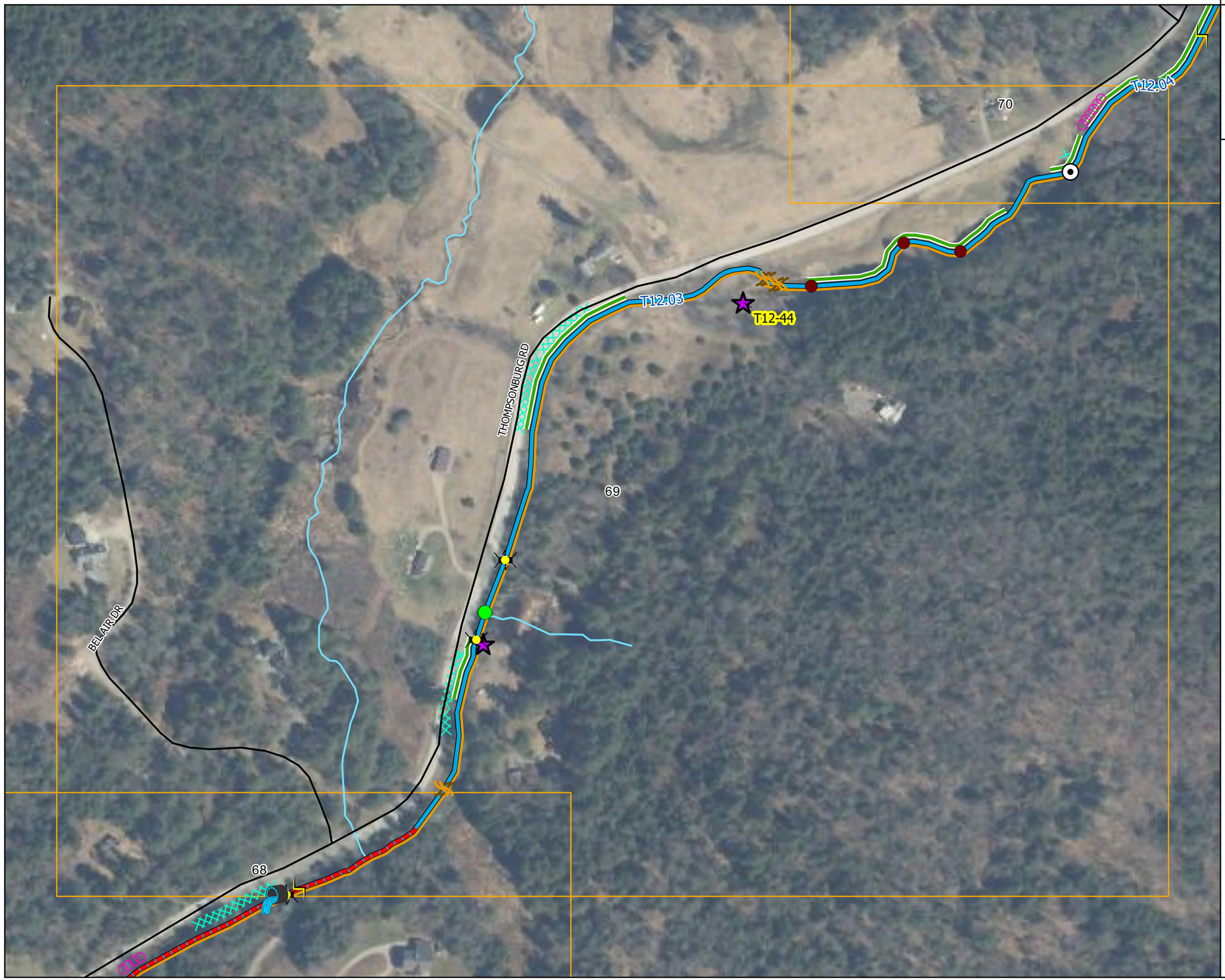
N

0 250 500 Feet

Appendix D

Map: 69

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 70

Reach Stressors and Project Identification

71

T12.04

70

THOMPSONBURG RD

FIELDSTONE WAY

UNDER THE MOUNTAIN RD

69

T12.03

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 71

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 72

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 73

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

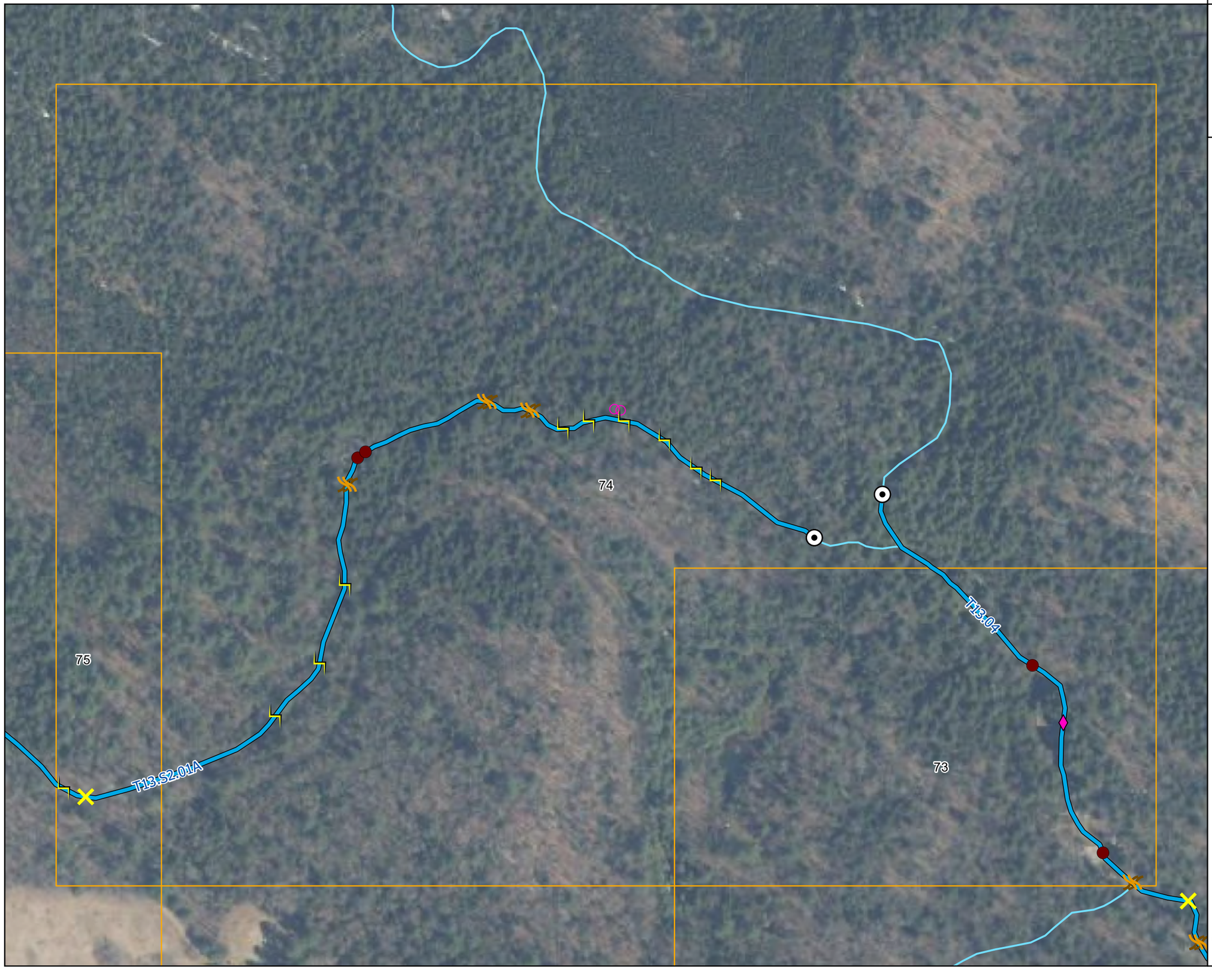
0 250 500 Feet

T13.S2.01A
74
73
T13.04
ALDRICH RD
FOREST MOUNTAIN RD
GLEN RD
THREE POND RD
HILL DR
HIDE AND SEEK RD

Appendix D

Map: 74

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 75

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

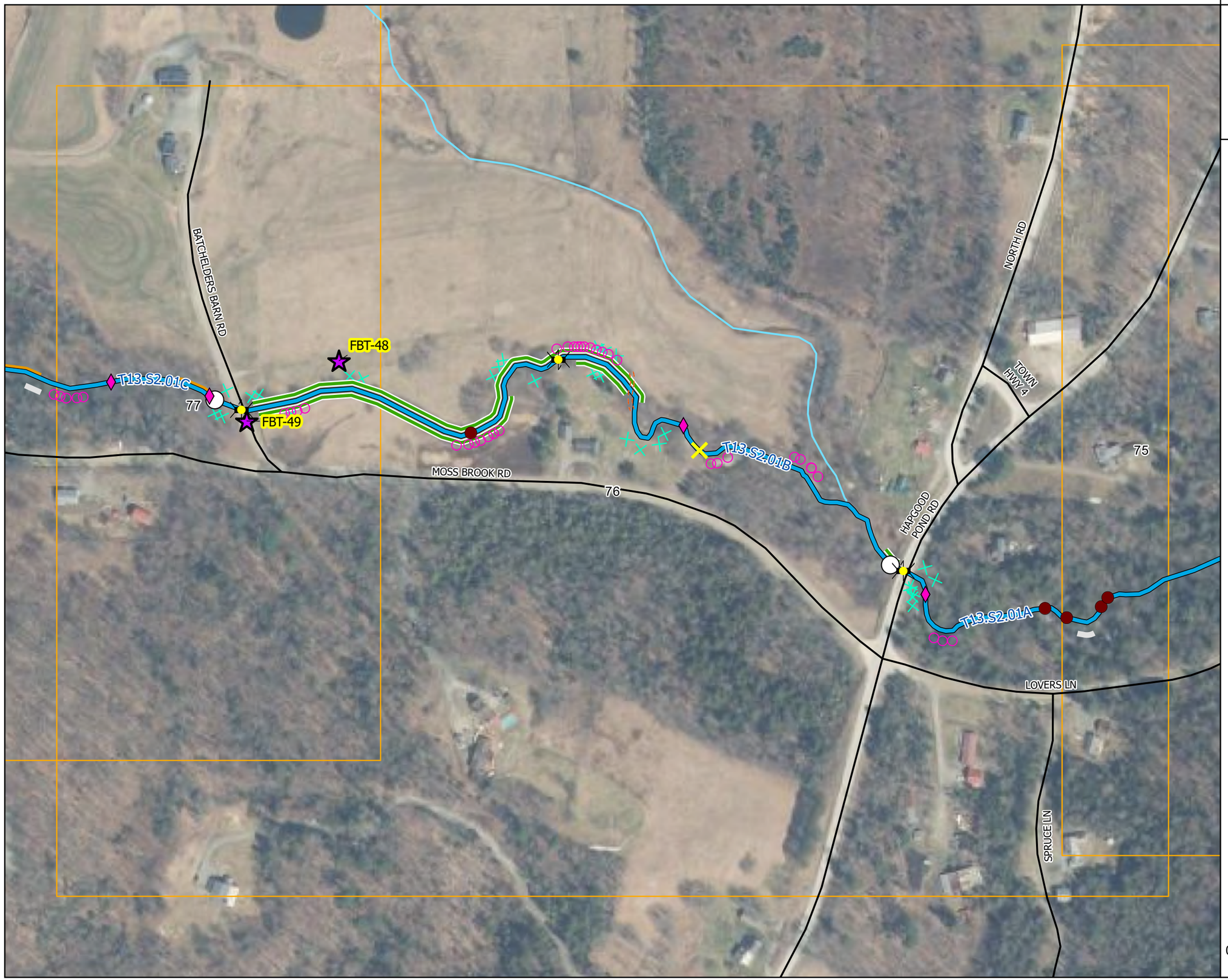
N

0 250 500 Feet

Appendix D

Map: 76

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 77

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 78

Reach Stressors and Project Identification

79

78

34

BARKER RD

PINGREE PARK LN

OLD STOWELL HL

HEILLS PEAK RD

LORENZO LN

UB-52

UB-51

T14.01A

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

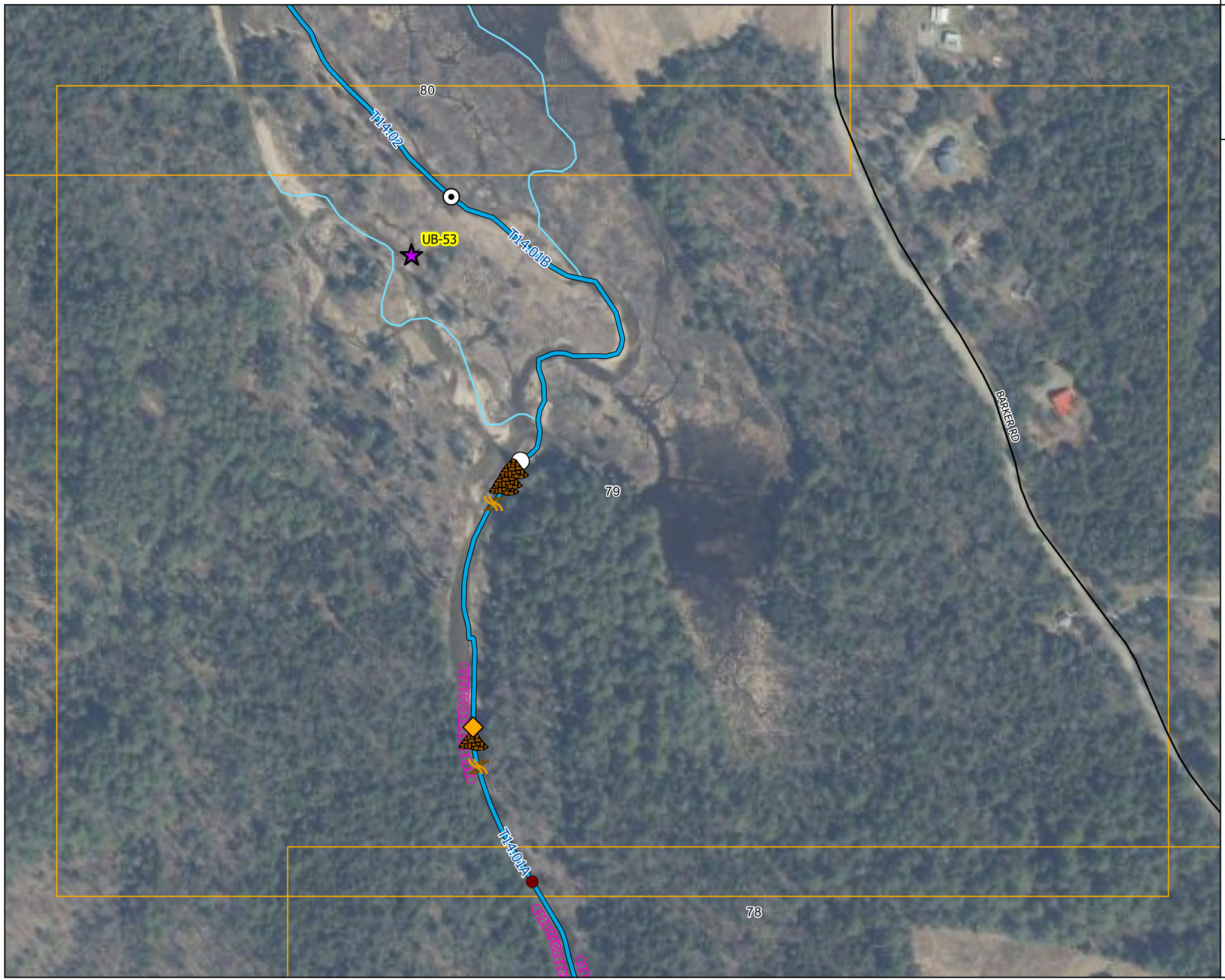
N

0 250 500 Feet

Appendix D

Map: 79

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 80

Reach Stressors and Project Identification

81

80

79

T14:02

T14:01B

UB-53

BARKER RD

LANDGROVE RD

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 81

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 82

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 83

Reach Stressors and Project Identification

84

T14.02

83

UB-56

82

LANDGROVE RD

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

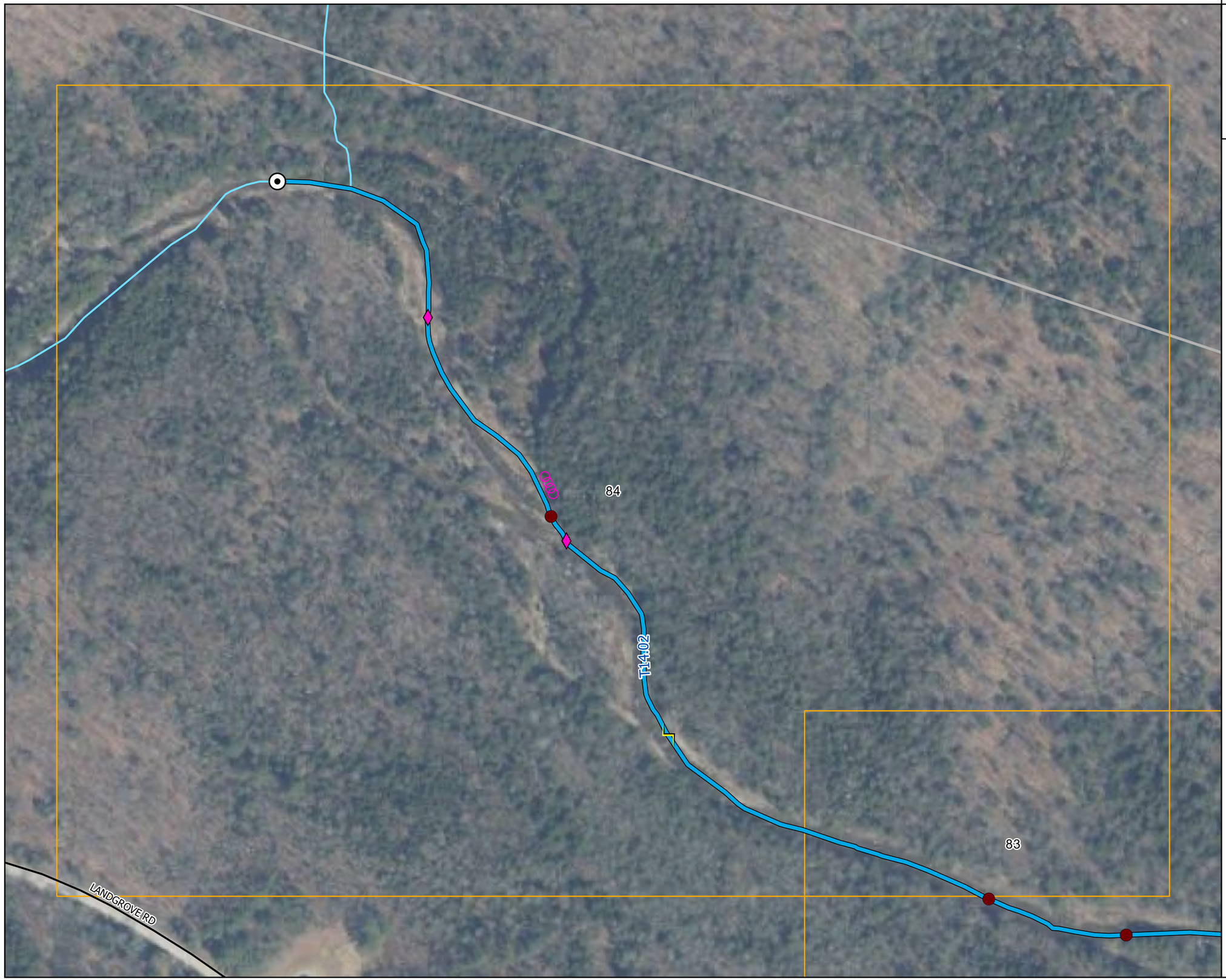
N

0 250 500 Feet

Appendix D

Map: 84

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

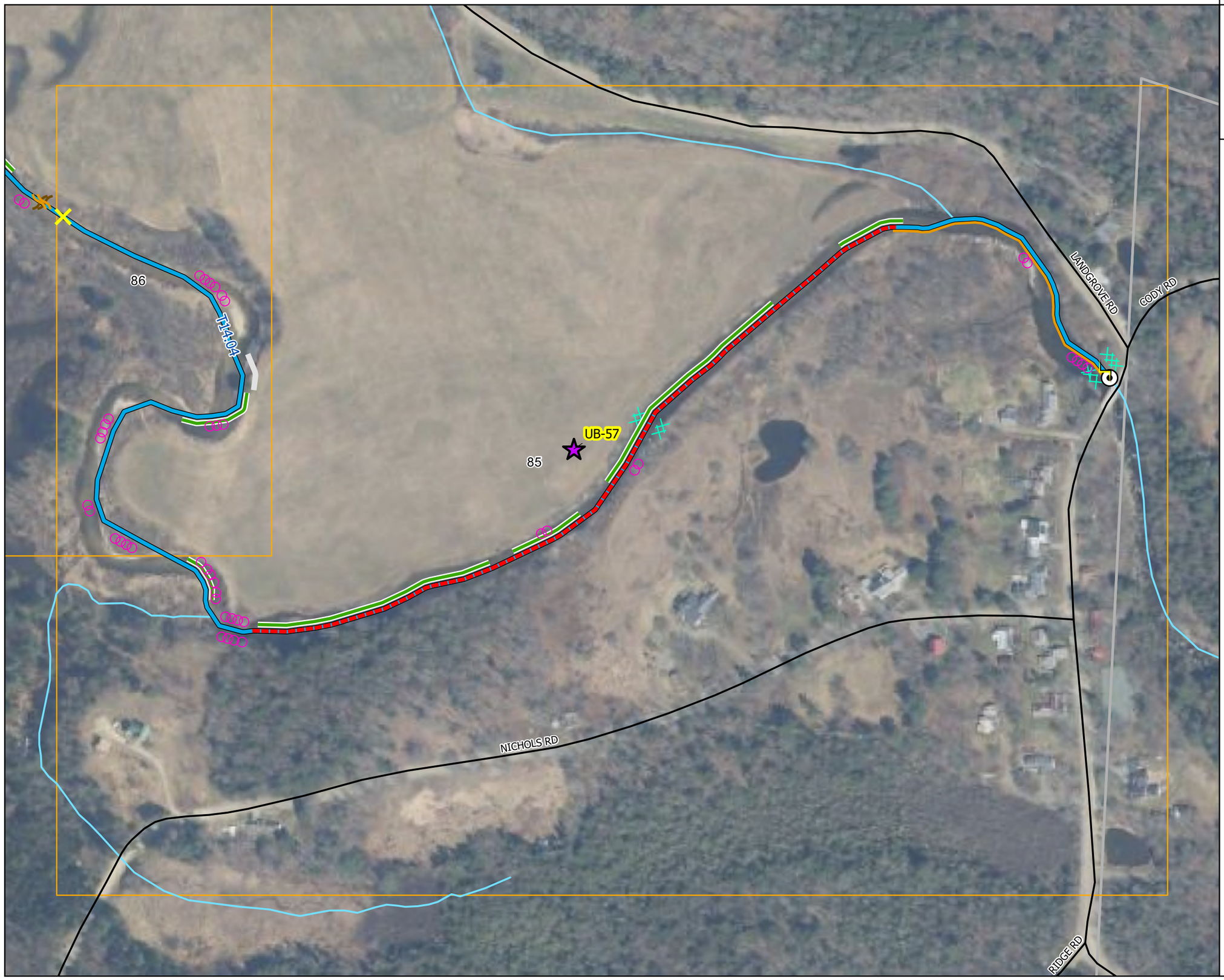
N

0 250 500 Feet

Appendix D

Map: 85

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

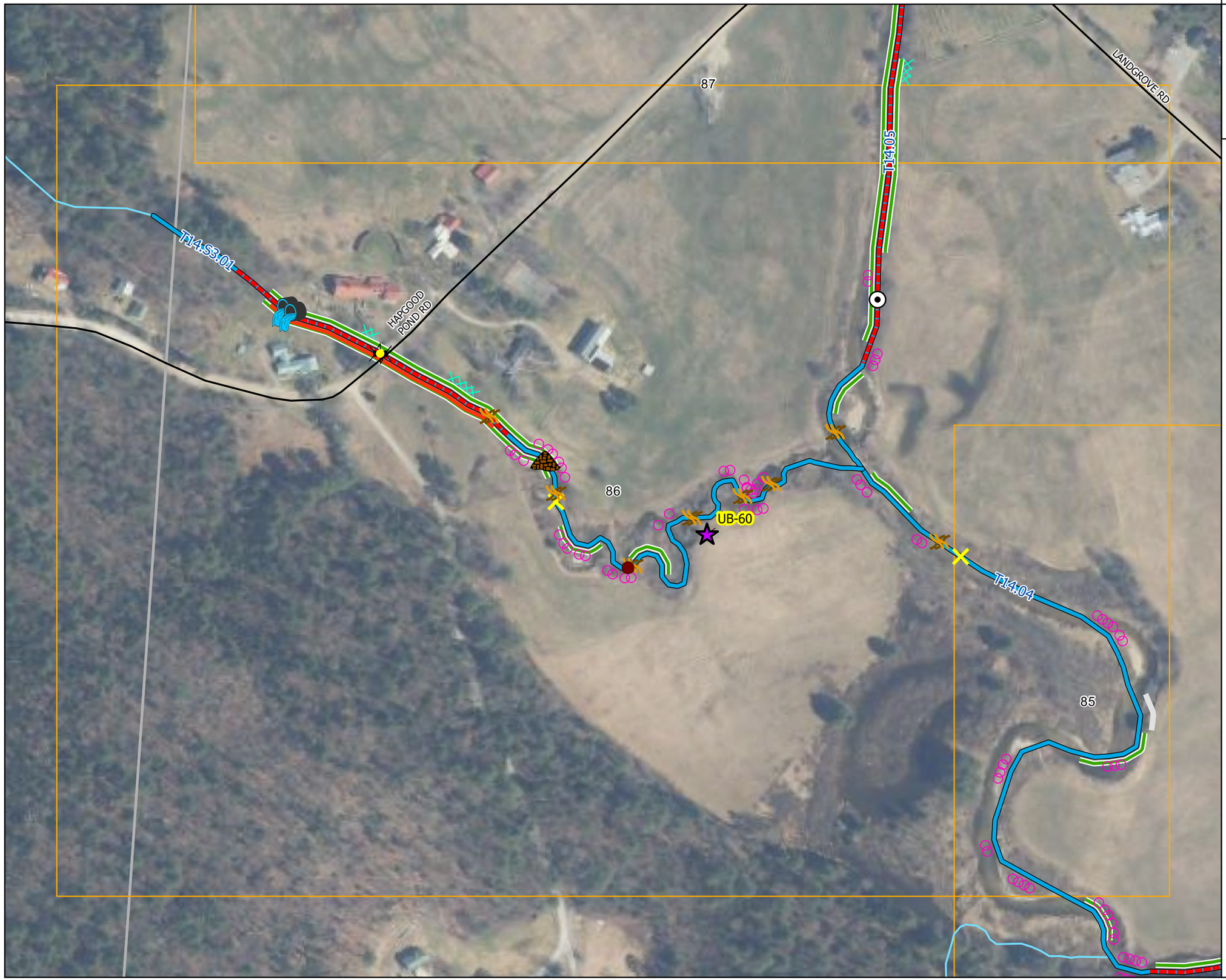
N

0 250 500 Feet

Appendix D

Map: 86

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 87

Reach Stressors and Project Identification

UB-58

88

T1-405

87

86

LANDGROVE RD

OLD COUNTY RD W

HAPGOOD POND RD

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

Appendix D

Map: 88

Reach Stressors and Project Identification

- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

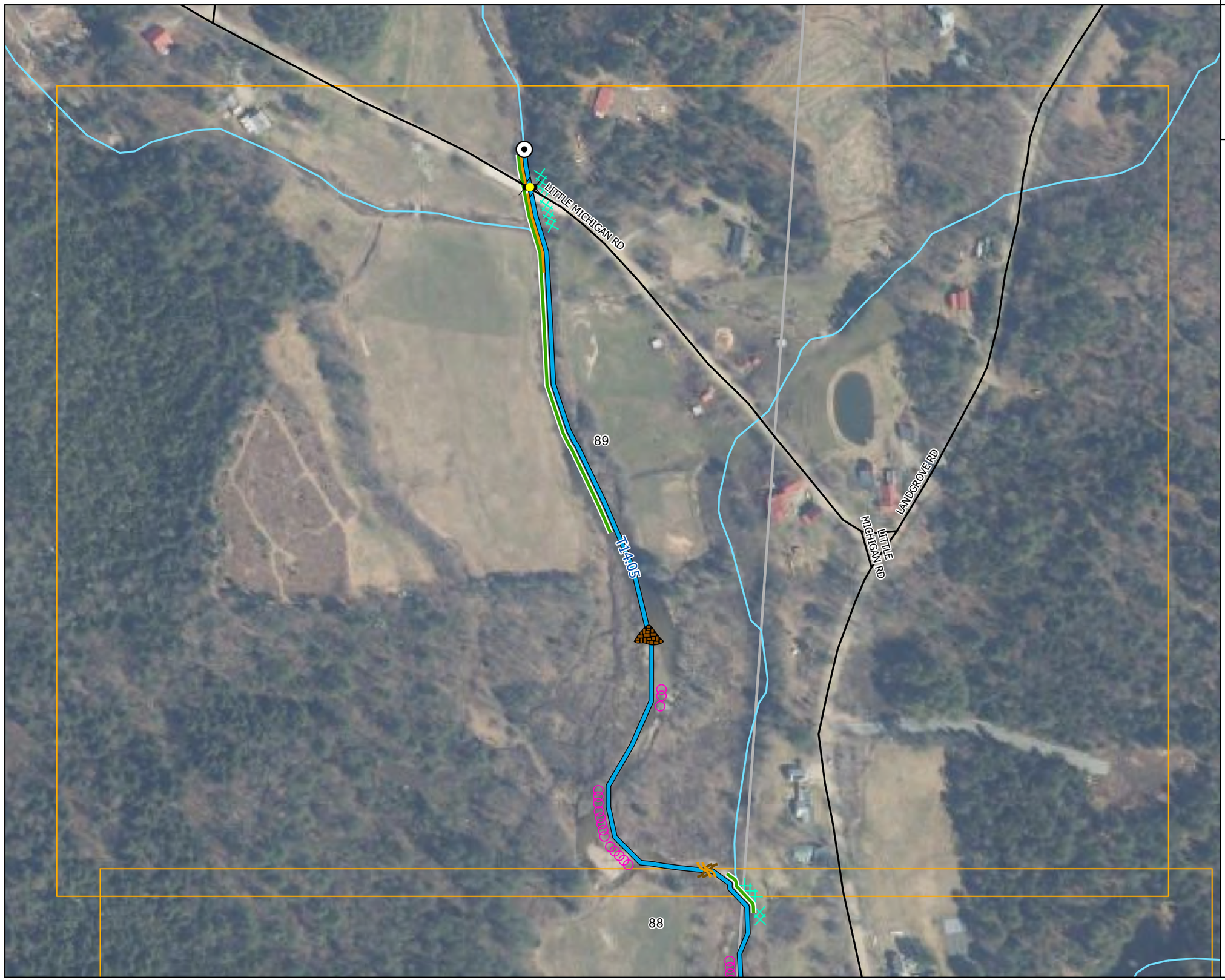
N

0 250 500 Feet

Appendix D

Map: 89

Reach Stressors and Project Identification



- Project Location
- Alluvial Fan
- Beaver Dam
- Bridge or Culvert
- Cross Section Location
- Debris Jam
- Dredging
- Flow Regs and Withdrawals
- Grade Control
- Gully
- Migration
- Steep Riffle or Head Cut
- Stormwater Input
- Stream Crossing
- Bank Armoring or Revetment
- Buffers Less than 25 feet
- Development
- Encroachment
- Erosion
- Mass Failure
- Straightening
- Reach Breaks
- Segment Breaks
- Phase II Reach/Segment
- Surface Waters
- Map Grid (Page ID)
- Roads
- Town Boundaries

N

0 250 500 Feet

APPENDIX E**:**

Site Level Project Opportunities

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-1 **Meadows Rd** **Jamaica** R13 43.100411 -72.769739	**Passive Restoration** Conservation	Very active channel setting with huge volumes of coarse sediment deposited at the Ball Mountain Brook confluence. A large and long flood chute/side channel continues along the west side of a large forested island with several houses. The primary channel receives the marjority of flow. Partial to full avulsion is possible due to the high sediment loads and potential for mass failure along the steep left bank. FEMA 100-year and floodway mapping covers both of channels well.	Establish a conservation easement to protect critical floodplain areas. FEMA zones already limit development through most of the existing forested areas.	High	Low	Protect a critical floodplain area from any future development or modifcation of the secondary channel.	Low
WR-2 **W River Trail** **S. Londonderry** R18 43.170469 -72.797198	**Passive Restoration** Corridor Easement	Small but accessible floodplain that appears to be somewhat managed, possibly as a hay field. Site is located within the FEMA detailed 100-year floodplain.	Ensure that the land is managed to provide floodplain function	Low	Low	Protect a critical floodplain area from any future development or modifcation of the secondary channel.	Low
WR-3 **W River Trail** **S. Londonderry** R18 43.184349 -72.803978	**Active Restoration** Stormwater Management	A gravel parking area is located at the trailhead at the end of the road. Stormwater runoff is not collected in any ditches and primarily ponds along the western and southern side and then discharges at sheetflow down the steep bank to the east. Edges of the road and parking lot have a buildup of grader berm material, which could lead to concentrated flow paths and erosion.	Install a ditch or swale around the parking area to collect runoff and discharge it to a basin with a stable overflow down the steep bank.	Low	Low	Reduce sediment and nutrient inputs to the channel, prevent against potential gully formation.	Low
WR-4 **W River Street** **S. Londonderry** R19-A 43.18637 -72.807768	**Active Restoration** Stormwater Management	A small farm has a barnyard area with very wet exposed soils draining to the roadside ditch. Additional runoff to the ditch comes from the bedding/manure piles to the east of the fenced in area. A small gully is forming at the outlet of the cross-culvert down the steep embankment to the river.	Improve the storage area for manure and bedding, stabilize eroding flow paths, and install a BMP near the cross-culvert inlet.	Low	High	Reduce a significant source of nutrients and sediment.	Med
WR-5 **W River Street** **S. Londonderry** R19-B 43.191279 -72.813989	**Active Restoration** Stormwater Management	Gravel road with a poorly formed gravel ditch draining to a drop inlet discharging directly to the river.	Improve/enlarge the ditch to increase capacity and establish grass cover and/or install stone check dams near the drop inlet to trap fine sediment in the ditch. Potential Better Road project.	Low	Low	Reduce sediment inputs to the river.	Low/Med

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-6 **W River Street** **S. Londonderry** R19-B 43.191279 -72.813989	**Passive Restoration** Floodplain Restoration	Old building located along the right bank (south) immediately downtream of the Route 100 bridge has been impacted by several recent floods. The lower floor is abandoned.	Investigate options for FEMA buyout. Remove the structure and restore a narrow floodplain strip with native vegetation.	Medium	Low	Remove a structure that is prone to flood damage and could collapse into the river.	Med/High
WR-7 **Route 100** **Londonderry** R19-C 43.204338 -72.82551	**Passive Restoration** Corridor Easement	Large floodplain wetland area with a large flood chute connecting to the main channel. The floodplain ties into a smaller upland floodplain that remains very accessible on the right (west) bank.	Establish a river corridor easement to protect floodplain area.	High	Medium	Protect a large and accessible floodplain area from future development or modificaiton.	Med
WR-8 **Route 100** **Londonderry** R19-C 43.210899 -72.825152	**Passive Restoration** Corridor Easement	Large flood chute immediately downstream of the Route 100 bridge with significant deposits of coarse sediment and LWD. The flood chute rejoins the channel at the confluence with Flood Brook.	Establish a river corridor easement to protect flood chute and floodplain area.	Medium	Low	Protect a large and accessible flood chute from future development or modificaiton.	Low
WR-10 **Route 100** **Londonderry** R21 43.226784 -72.816237	**Active Restoration** Floodplain Restoration and Wastewater	The leachfield for the commercial complex is located on accessible floodplain along the right (north) bank. This area was deeply inundated during the 2011 and 2023 floods.	Assess alternate locations for the wastewater system. Restore the floodplain with plantings and potentially bench cuts to improve access.	High	High	Remove a highly vulnerable wastewater system from the floodplain and provide additional floodplain storage and habitat.	High

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-11 **Route 11** **Londonderry** R21 43.22805 -72.812533	**Active Restoration** Floodplain Restoration	An elevated floodplain on the left (south) bank is located at the confluence with Utley Brook. The floodplain area is generally 1 foot lower in elevation than the businesses on the north bank along Route 11 (NAPA auto, Jelley Deli, Garden Market). The bank and floodplain are dominated by japanese knotweed. Restaurant pumps under the river to leachfield on this floodplain.	Lower the floodplain and install a flood chute or similar features to provide flood relief for commercial properties along Route 11. Install plantings to improve habitat and reduce invasive species.	High	Medium	Provide flood relief for commercial properties and enhance habitat.	High
WR-12 **Route 11** **Londonderry** R21 43.228296 -72.812097	**Passive Restoration** Buffer Planting	A mowed area along the top of the bank is used for picnic tables and general recreation behind the Garden Market and Jelley Deli. Minimal woody vegetation is present along the bank and some slumpage was observed.	Install targeted woody vegetation plantings to improve habitat and bank stabilization. Picnic tables and other recreational features should be considered when installing plantings to maintain public use areas.	Low	Medium	Improve bank stability and habitat while maintaining recreational access.	Low
WR-13 **Edgehill Rd** **Londonderry** R21 43.226 -73.8084	**Active Restoration** Road Drainage	A narrow and steep section of Edgehill road is lacking ditches and has significant gully erosion along both sides of the road. A cross culvert is discharging large volumes of sediment to a floodplain bench which then drains directly into the river downstream of the dam.	Install narrow ditches along both sides of the road. Install a sediment trap at the outlet of the cross-culvert and provide a stable overflow into the river. Upper half of project area requires drainage improvements for MRGP compliance.	Low	Medium	Reduce sediment and nutrient inputs to the river.	Med
WR-14 **Edgehill Rd** **Londonderry** R22-A 43.226598 -72.807145	**Active Restoration** Dam Removal	The "Williams" dam is over 100 years old and impounds a long stretch of the upstream channel with large volumes of accumulated sediment.The impounded area contains a large open water and marsh wetland system providing important wildlife habitat and flood storage. The dam exacerbated flooding along Route 11 during recent flood events. Dam removal has been discussed in depth with the Town and stakeholders.	Remove the dam and restore the upstream channel with floodplain benches. In-stream grade control structrures will likely be required to reduce channel erosion. Recommend installation of wetland micropools and other habitat features within the new floodplain.	High	High	Improve conveyance of floodwaters through the developed areas along Route 11 and 100.	High
WR-15 **Cobble Ridge Rd** **Londonderry** R23 43.235276 -72.797182	**Active Restoration** Road Drainage	Runoff from Route 100 and the intersection with Cobble Ridge Road is flowing down the southwest bridge abutment with gully erosion and destabilization of the wingwall.	Improve grading at the intersection to direct runoff to the armored embankment closer to Route 100. Stabilize the embankment as needed to prevent erosion.	Medium	Low	Protect the bridge embankment from erosion, reduce minor sediment inputs to the channel.	Med

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-16 **Route 100** **Londonderry** R23 43.241547 -72.790656	**Passive Restoration** Corridor Easement	Nice accessible floodplain along both banks. The southern floodplain has a large wet meadow area with historic beaver activity.	Establish an easement to protect the floodplain area from potential development.	Medium	Medium	Protect a large and accessible floodplain area from future development or modificaiton.	Low/Med
WR-17 **Boynton Rd** **Londonderry** R24-A 43.245443 -72.787887	**Active Restoration** Utility	Several power poles are located along the left (east) bank with active erosion and channel migration. Two of the poles are particularly at risk of being washed out.	The channel is actively developing meanders through this area of semi-accessible floodplain. It would be very preferable to move the power lines and poles away from the channel, versus bank stabilization.	Medium	Low	Protect the utility poles and allow the channel to continue planform adjustment.	Low/Med
WR-18 **Londonderry** R24-A 43.246777 -72.788424	**Passive Restoration** Buffer Planting and Corridor Easement	Left (east) floodplain was recently converted from meadow to hayfield within minimal (1-2ft) of buffer vegetation. Active bank erosion and planform adjustment through most of this segment.	Establish a corridor easement that accounts for ongoing planform adjustment and install woody plantings to improve habitat.	Medium	Medium	Restore and protect an important floodplain area.	Med
WR-19 **Boynton Rd** **Weston** R24-A 43.248338 -72.789571	**Passive Restoration** Buffer Planting and Corridor Easement	Right (west) floodplain is accessible in large flow events and has a reduced buffer width. Most of the floodplain is used for hay. Planform adjustment starts at the southern end of this floodplain and increases downstream.	Establish a corridor easement that accounts for ongoing planform adjustment and install woody plantings to improve habitat.	Low	Low	Restore and protect a floodplain area.	Med
WR-20 **Boynton Rd** **Weston** R24-B 43.251635 -72.789787	**Active Restoration** Channel Restoration	Historic armoring was observed in several areas along the segment. Armor in the lower portion is preventing planform adjustment and both banks have semi-accessible hayfield floodplains.	Remove historic armor and establish a corridor easement to provide area for planform adjustment and floodplain access.	Medium	Low	Remove historic armor to promote planform adjustment, protect floodplain areas.	Low/Med

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-21 **Boynton Rd** **Weston** R25-A 43.261951 -72.794406	**Active Restoration** Buffer Planting and Corridor Easement	Right (west) floodplain is accessible in large flow events and has a reduced buffer width. Most of the floodplain is used for hay. The channel is showing early signs of planform adjustment through this section.	Establish a corridor easement that accounts for ongoing planform adjustment and install woody plantings to improve habitat.	Medium	Low	Restore and protect a floodplain area.	Low/Med
WR-22 **Lawrence Hill Rd** **Weston** R26 43.29105 -72.794728	**Passive Restoration** Buffer Planting	Narrow park property along the right (west) bank has a narrow buffer of knotweed, honeysuckle, and multiflora rose.	Remove invasive species along bank and establish a narrow buffer with native woody species. A full 25ft buffer width is likely not compatible with the recreational uses of the property.	Low	Low	Remove invasive species and improve buffer vegetation.	Low
WR-23 **Lawrence Hill Rd** **Weston** R26 43.291435 -72.794383	**Active Restoration** IDDE	The stormwater pipe discharging to the channel immediately southeast of the Lawrence Hill Bridge had a small amount of baseflow and obvious detergent bubbles.	Investigate and mitigate the source of the potential illicit discharge	Low	Medium	Remove a potential source of significant nutrients and bacteria/pathogens to the river.	Low/Med
WR-24 **Route 100** **Weston** R27 43.294819 -72.790102	**Active Restoration** Floodplain Restoration	Right floodplain (west) is a hayfield with a narrow strip of herbaceous wetland vegetation along the bank. The entire reach is backwatered by the Weston dam. The right bank floodplain is typically 1 foot higher in elevation than the businesses and infrastructure along Route 100, including the fire station.	Excavate a bench to establish floodplain area that is lower than the buildings along Route 100. Establish a corridor easement and improve the floodplain with plantings.	High	Medium	Provide flood relief for properties and critical infrastructure along Route 100. Improve habitat along the channel.	High

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-26 **Farm Road** **Weston** R28-A 43.300862 -72.786967	**Active Restoration** Agricultural Improvements	A stream ford for a farm road has erosion along both banks. The ford through the channel is stable.	Install additional stone along both sides of the ford to prevent erosion into the channel.	Low	Medium	Reduce sediment and nutrient inputs to the channel.	Low
WR-27 **Route 100** **Weston** R28-B 43.308296 -72.786904	**Active Restoration** Stormwater Management	Runoff from Route 100 passes through a narrow hayfield and drains down a very steep bank to the river. A small mass failure is present, likely exacerbated by roadway runoff.	Install a small stormwater treatment basin in the hayfield or direct runoff further south to a more stable portion of the steep bank.	Low	Low	Reduce sediment and nutrient inputs to the channel.	Med
WR-28 **Route 100** **Weston** R28-B 43.311479 -72.78951	**Active Restoration** Corridor Easement	Large floodplain complex of hayfield extending downstream across multiple properties. These floodplains were heavily accessed during the July 2023 floods.	Establish a corridor easement to prevent future development along the floodplains. Buffer plantings could be installed to enhance habitat.	Medium	Medium	Protect a large floodplain area.	Low/Med
WR-29 **Lawrence Hill Rd** **Weston** R28-B 43.313746 -72.790354	**Passive Restoration** Buffer Planting	Banks and floodplain were recently cleared and a pond was constructed above the edge of the floodplain. The buffer is very degraded.	Install buffer plantings along the bank to improve habitat and stabilize the steep bank to reduce risk of erosion.	Low	Low	Improve bank and buffer habitat and stability	Low
WR-30 **Route 100** **Weston** R29-A 43.322342 -72.790354	**Passive Restoration** Corridor Easement	An accessible forested floodplain is located on the right bank (north) starting immediately downstream of the Route 100 bridge.	Establish a corridor easement to protect the forested floodplain from future development or tree clearing.	Medium	Low	Protect a forested floodplain from development or clearing.	Low

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-31 **Route 100** **Weston** R30-A 43.326872 -72.779871	**Passive Restoration** Corridor Easement and Buffer Planting	A large and accessible meadow floodplain is located south of Kile Road. The E-type channel was historically straightened and is adjusting planform. Minimal woody vegetation is located along the banks and floodplain, likely due to periodic mowing, and potentially beavers.	Establish a corridor easement and install buffer plants of native shrubby species. Easement and plantings should account for ongoing planform adjustment.	Medium	Medium	Protect and enhance a large and important floodplain.	Low/Med
WR-33 **Route 100** **Weston** R30-C 43.336661 -72.784962	**Passive Restoration** Buffer Planting	The right bank (west) has been recently mowed leaving only a narrow strip of buffer vegetation. Based on recent aerial imagery vintages the buffer has been wider.	The area is likely to small to justify a corridor easement, however installation of buffer plantings would improve habitat and stabilize the banks which show some evidence of erosion.	Low	Low	Improve bank/buffer vegetation and habitat.	Low
WR-34 **Route 155** **Weston** R30-C 43.337595 -72.785405	**Active Restoration** Floodplain Reconnection	The section of channel immediately upstream of the Route 100 crossing is straightened and incised with reduced buffer vegetation along both sides.	Stone weirs or other practices to raise the channel bed could reestablish floodplain access. Buffer planting and corridor easements are also recommended to improve and protect the floodplain. Floodplain restoration could tie into the large wetland complex to the northwest.	Medium	Medium	Reestablish floodplain access and improve the floodplain.	Med
WR-35 **Route 155** **Weston** R30-C 43.341973 -72.786617	**Active Restoration** Channel Restoration	Landowner placed cobbles and bank run gravel partially filling the channel, presumably in an effort to reduce erosion towards mowed area. Fill has created a pinch point which will likely increase bank erosion.	Remove channel fill and work with landowner to investigate other options for reducing bank erosion.	Low	Medium	Remove a channel constriction and reduce erosion.	Low/Med

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-36 **Route 155** **Weston** R30-C 43.342385 -72.78683	**Passive Restoration** Buffer Plantings	Landowner has recently cleared vegetation along a portion of the right (west) bank. Some areas maintain a narrow strip of herbaceous vegetation, other areas are lawn continuing to the top of bank.	Install buffer plantings along the bank to improve habitat and stabilize the steep bank to reduce risk of erosion.	Low	Medium	Improve bank/buffer vegetation and habitat.	Low
WHR-37 **Kendall Farm Road** **Winhall** T11.08-A 43.140377 -72.916975	**Passive Restoration** Conservation	Very active channel setting with huge volumes of coarse sediment deposited throughout the segment. The channel is braided with several large avulsions, likely changing course repeatedly during large storms. Forested floodplain areas provide critical storage of sediment and debris during flood events. FEMA AE zone accurately depicts the floodplain area.	Establish a conservation easement to protect critical floodplain areas. FEMA zones already limit development through most of the existing forested areas.	High	Medium	Protect a critical floodplain area from any future development or modifcation of the secondary channels.	Med
WHR-38 **Kendall Farm Road** **Winhall** T11.08-A 43.141132 -72.920704	**Passive Restoration** Buffer Plantings and Agricultural BMP	The hayfield has a low area with wetland soils and vegetation that is adjacent to the floodplain area. Manure spreading was observed in this location, with surface flow directly to the channel.	Establish a buffer in the low corner of the field and limit manure spreading practices to reduce nutrients inputs to the channel	Low	High	Reduce nutrient inputs to the channel, improve buffer vegetation.	Low
WHR-39 **Lightfoot Camp Road** **Winhall** T11.08-B 43.138836 -72.931089	**Active Restoration** Floodplain Restoration	An accessible floodplain along the left bank crossed the forest road immediately north of the bridge. This area likely washes out during floods and reconsturcted.	Lower the road elevation and armor to allow flood flows to cross over the road, or install a culvert (box or squash). Road slopes would be very steep if an at grade crossing is installed.	Medium	Low	Restore flood chute connection and reduce impact of the bridge constriction on floodplain access.	High
WHR-40 **Lightfoot Camp Road** **Winhall** T11.08-B 43.140222 -72.9341	**Active Restoration** Stormwater Management	A series of turnouts and waterbars convey runoff from the forest road directly to the channel.	There is room for a sediment trap between the road and the stream to capture sediment and reduce inputs to the channel.	Low	Medium	Reduce sediment and nutrient inputs from road runoff to the stream.	Low

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
T12-41 **Carley Lane** **Londonderry** T12.03 43.193116 -72.799853	**Active Restoration** Stormwater Management	Intermittent stream passes under Carley Lane and immediately discharges to T12. The culvert outlet headwall is being eroded by road runoff and the culvert is perched and rotted out.	Replace the culvert and remove the AOP barrier at the outlet by adjusting culvert slope or installing a tailwater control. The culvert headwall needs to be reconstructed to reduce erosion.	Medium	Medium	Reduce sediment and nutrients inputs to the channel from the eroding road embankment and remove an AOP barrier.	Med
T12-43 **Thompsonburg Road** **Londonderry** T12.03 43.196569 -72.793708	**Active Restoration** Bridge Replacement	The private driveway bridge is undersized and resting on timber abutments that are rotting and unstable. Some evidence of previous repair attempts that are not sufficient.	Replace the bridge abutments with concrete, existing bridge may be wide enough for bankfull width if moved to better abutments.	Medium	Low	Reduce a channel constriction and replace failing bridge abutments.	High
T12-44 **Thompsonburg Road** **Londonderry** T12.03 43.198616 -72.791593	**Passive Restoration** Floodplain Restoration	Abandoned floodplain meadow on the left bank is disconnected due to historic ditching.	A bench cut on the upstream portion of the floodplain would reconnect the historic flood chute and improve floodplain access.	Low	Low	Improve floodplain access.	Low
T12-45 **Thompsonburg Road** **Londonderry** T12.04 43.206996 -72.78174	**Active Restoration** Agricultural Improvements	Water access from pasture has erosion from cows.	Install a stable stone lined access with fencing to limit area of impact.	Low	Medium	Reduce sediment and nutrients inputs from ongoing bank erosion.	

Appendix E: Site Level Restoration Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
T12-46 **Thompsonburg Road** **Londonderry** T12.04 43.207371 -72.781142	**Active Restoration** Bank Stabilization	Bank erosion along footpath from recreation area.	Install stone lining or steps to provide stable access to the channel from the recreation area.	Low	Medium	Reduce sediment and nutrients inputs from ongoing bank erosion.	
FBR-48 **Moss Brook Road** **Peru** T13.S2.01-B 43.244173 -72.899255	**Passive Restoration** Buffer Plantings and Conservation Easement	Approximately 1,000 feet of narrow or absent woody buffer along both banks east of Batcheders Barn Road crossing. Same parcel has a smaller tributary that completely lacks buffer. A water access for cattle has minor erosion.	Install buffer plantings along the bank to improve habitat and stabilize the steep bank to reduce risk of erosion. Establish easement to protect against future development. Stabilize water access and add fencing to limit area of access.	Low	Medium	Improve bank/buffer vegetation and habitat.	Med
FBR-49 **Batchelder Barn Road** **Peru** T13.S2.01-B 43.24387 -72.90005	**Active Restoration** Aquatic Organism Passage	10ft wide squash culvert has a 2ft outlet drop to a deep pool, likely a full AOP barrier during all flow conditions.	The culvert is in good condition and likely very low priority for replacement. Tailwater control could be utilized to raise the bed elevation to reduce or eliminate the outlet drop.	Low	High	Restore AOP and reconnect a large area of upstream habitat.	Med
FBR-50 **Moss Brook Road** **Peru** T13.S2.01-B 43.244514 -72.902787	**Active Restoration** Berm Removal	Approximately 400-500 feet of near continuous historic berm is located along the north bank, restricting access to an approximately 100ft wide floodplain.	Remove portions of the berm to re-establish floodplain access.	Medium	Low	Improve floodplain access.	Med

Appendix E: Site Level Restoration Project Opportunities in the Upper West River							
Project ID, Location, Reach, Lat/Long	**Type of Project**	**Site Description Including Stressors and Constraints**	**Project or Strategy Description**	**Hazard Mitigation Priority**	**Ecological Benefits Priority**	**Project Benefits**	**Costs**
UB-51 **Pingree Park** **Londonderry** T14.01-A 43.230594 -72.813799	**Active Restoration** Stormwater Management and Gully Stabilization	A portion of the gravel driveway and parking lot and grassed recreational areas drain to the south corner of the park to an area of active gully erosion discharging to the floodplain.	Install a stormwater treatment basin along the edge of the grassed area and stabilize the gully.	Medium	High	Reduce nutrient and sediment inputs to the channel.	Med
UB-52 **Pingree Park** **Londonderry** T14.01-A 43.231829 -72.815541	**Active Restoration** Stormwater Management	A grassed area and portion of the tennis court drain through a wide grassed swale and discharge to the steep forested valley wall along Utley Brook. The drainage is close to a gully, but that appears to be primarily from groundwater seepage and not stormwater runoff.	Enhance the swale to improve infiltration and reduce stormwater runoff to the steep valley wall.	Low	Low	Reduce risk of future gully formation, enhance existing infiltration.	Med
UB-53 **Barker Road** **Londonderry** T14.01-B 43.238401 -72.817833	**Passive Restoration** Corridor Easement	Very important floodplain area with an active large floodchute that could become a primary channel.	Establish a corridor easement to protect the floodplain from any management or development.	Medium	Medium	Preserve a large and important floodplain area.	Low/Med
UB-54 **Landgrove Road** **Londonderry** T14.01-B 43.24433 -72.820667	**Passive Restoration** Corridor Easement	Nice forested floodplain with accesible wetland areas.	Establish a corridor easement to protect the floodplain from any management or development.	Low	Medium	Preserve a small but nice floodplain area with good forested habitat.	Low/Med
UB-55 **Landgrove Road** **Londonderry** T14.01-B 43.245131 -72.820751	**Passive Restoration** Corridor Easement and Buffer Planting	Hayfield with very accessible floodplain areas that has reduced or totally lacking buffer vegetation. Some areas have active bank erosion with no root stabilization.	Establish a corridor easement and install buffer plants of native shrubby species. Easement and plantings should account for ongoing planform adjustment.	Medium	High	Protect and enhance a large and accessible floodplain area.	Low/Med

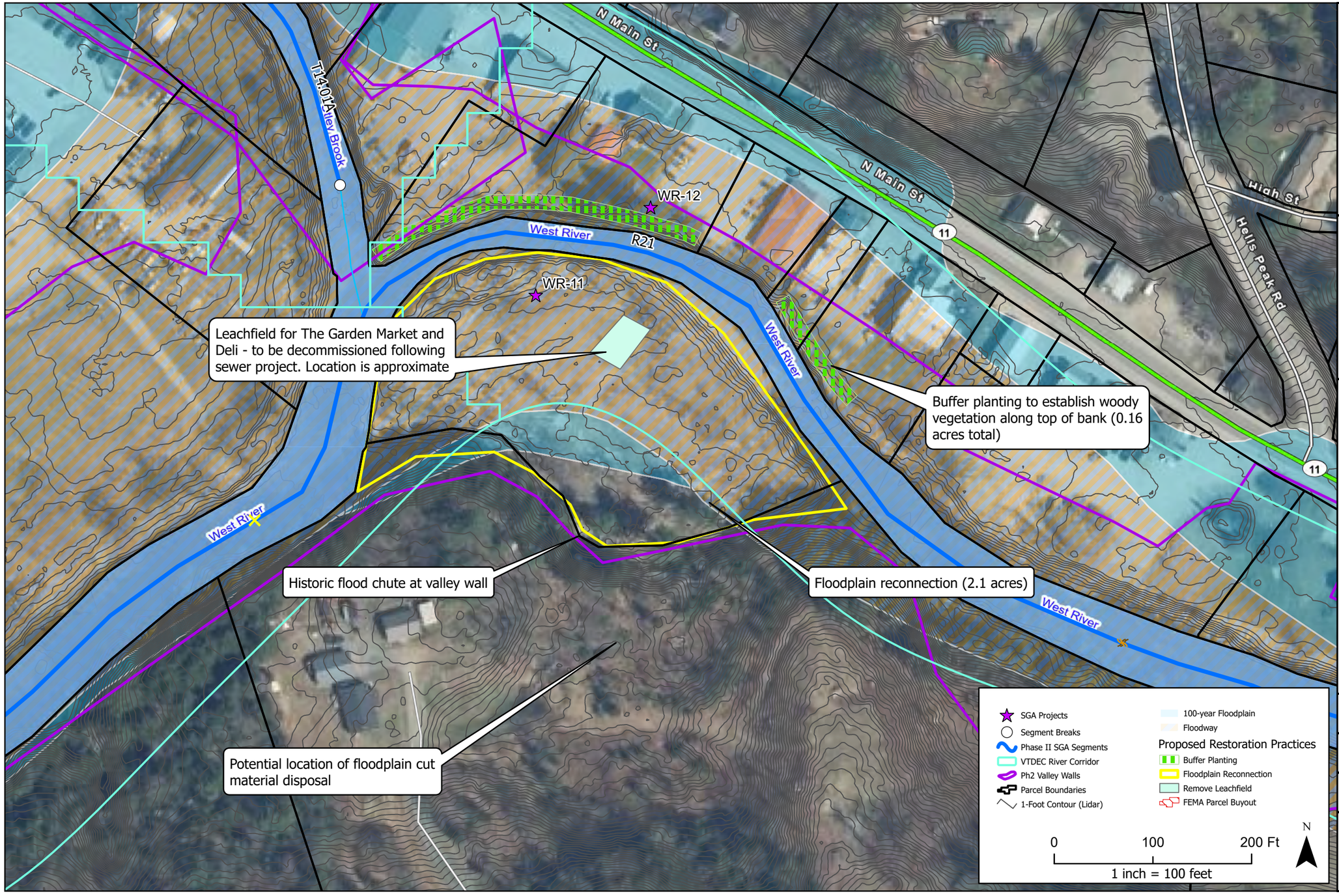
Appendix E: Site Level Restoration Project Opportunities in the Upper West River							
Project ID, Location, Reach, Lat/Long	**Type of Project**	**Site Description Including Stressors and Constraints**	**Project or Strategy Description**	**Hazard Mitigation Priority**	**Ecological Benefits Priority**	**Project Benefits**	**Costs**
UB-56 **Landgrove Road** **Londonderry** T14.02 43.24433 -72.820667	**Passive Restoration** Corridor Easement	Nice forested floodplain with large wetland areas downstream.	Establish a corridor easement to protect the floodplain from any management or development.	Medium	Medium	Preserve a large forested and wetland floodplain area.	Low/Med
UB-57 **Landgrove Road** **Landgrove** T14.04 43.260607 -72.852775	**Passive Restoration** Corridor Easement and Buffer Planting	Large hayfield parcel with some areas of accesible floodplain closer to Hapgood Pond Road. Southeast section is incised with no floodplain access. Buffer vegetation is very reduced along the left bank, increase bank erosion in some areas.	Establish a corridor easement and install buffer plants of native shrubby species. Easement and plantings should account for ongoing planform adjustment. Hayfield parcel north of Hapgood Pond Road is conserved through VLT for Bobolink habitat, this may be a good option for this parcel.	Medium	High	Improve bank/buffer vegetation and habitat and reduce future erosion risks.	Med
UB-58 **Landgrove Road** **Landgrove** T14.05 43.268844 -72.861915	**Passive Restoration** Buffer Planting	Large hayfield parcel with more floodplain access than the the downstream project area (UB-57). The channel is actively adjusting planform with areas of significant erosion. Buffer vegetation is very reduced along the right bank.	Establish a corridor easement and install buffer plants of native shrubby species. Easement and plantings should account for ongoing planform adjustment. Hayfield parcel north of Hapgood Pond Road is conserved through VLT for Bobolink habitat, this may be a good option for this parcel.	Medium	High	Improve bank/buffer vegetation and habitat and reduce future erosion risks.	Med
UB-59 **Landgrove Road** **Landgrove** T14.05 43.270607 -72.863163	**Active Restoration** Channel Restoration	Historic bank armor is located in several spots and is interupting planform development obseved in lower portions of the reach. Armor is located on VLT conserved lands, does not protect any infrastructure.	Remove the historic armor and establish buffer plantings to slow erosion during natural planform adjustment.	Low	Medium	Enhance planform adjustment processes and improve bank/buffer vegetation.	Med
UB-60 **Hapgood Pond Road** **Landgrove** T14.S3.01 43.262094 -72.859014	**Passive Restoration** Corridor Easement and Buffer Planting	Large hayfield parcel with active planform adjustment and reduced buffer vegetation. Floodplain access is limited.	Establish a corridor easement and install buffer plants of native shrubby species. Easement and plantings should account for ongoing planform adjustment. .	Medium	Medium	Improve bank/buffer vegetation and habitat and reduce future erosion risks.	Med

Appendix E: Site Level Infrastructure Resiliency Project Opportunities in the Upper West River

Project ID, Location, Reach, Lat/Long	Type of Project	Site Description Including Stressors and Constraints	Project or Strategy Description	Hazard Mitigation Priority	Ecological Benefits Priority	Project Benefits	Costs
WR-9 **Route 100** **Londonderry** R20 43.213899 -72.82387	**Infrastructure** Bank Stabilization	The channel is pinched between the armored embankment and bedrock on the left bank (east). The channel is deep along the toe of the road embankment and may be scouring under the armor slope.	Monitor the channel and slope for scour/undermining. May require installation of a rock weir or other structure to maintain the bed elevation and protect the road embankment. Refer project to VTRANS	Medium	Low	Protect the Route 100 embankment.	Med
WR-25 **Route 100** **Weston** R27 43.29652 -72.788123	**Infrastructure** Bank Stabilization	Bank erosion extends to the guardrail along Route 100 downstream of the farm bridge.	Install stone armor along the steep embankment to prevent erosion. Implementation of project WR-24 would reduce erosion risk along Route 100.	Medium	Low	Protect Route 100 embankment from erosion.	Med
WR-32 **Route 100** **Weston** R30-C 43.33532 -72.78521	**Infrastructure** Bank Stabilization	Several areas along the steep Route 100 embankment show active erosion extending to the guard rail. Some areas have recent repair attempts with small stone.	A stacked stone wall with large rock may be required to fully protect the steep embankment along Route 100.	Medium	Low	Protect Route 100 embankment from erosion.	Med
T12-42 **Thompsonburg Road** **Londonderry** T12.03 43.194053 -72.797868	**Infrastructure** Bank Stabilization	The channel is widening into the right bank and starting to erode the road embankment. Upstream sections have armor, this area does not.	Protect the road embankment with stone armor. A rock weir could be installed to center the thalweg within the channel.	Medium	Low	Protect the road embankment from erosion.	Low/Med
T12-47 **Route 11** **Londonderry** T12.04 43.207838 -72.778702	**Infrastructure** Bank Stabilization	The Route 11 embankment is eroding along an outside bend in the stream channel with no armoring. Roots of a dead tree are providing some stability but it is fully undercut, erosion will advance rapidly once the tree falls into the channel.	Install stone armor, likely stacked, to protect the road embankment. A rock vane could be installed to direct the thalweg away from the roadway.	Medium	Low	Protect the road from erosion.	Med

APPENDIX F**:**

30% Conceptual Designs
for High Priority Projects



Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:
-Contours are based on VCGI 0.7m LIDAR DEM (2016)
-Imagery is sourced from VCGI (2024)

Conceptual Design
Project WR-10 and WR-11
Londonderry, VT

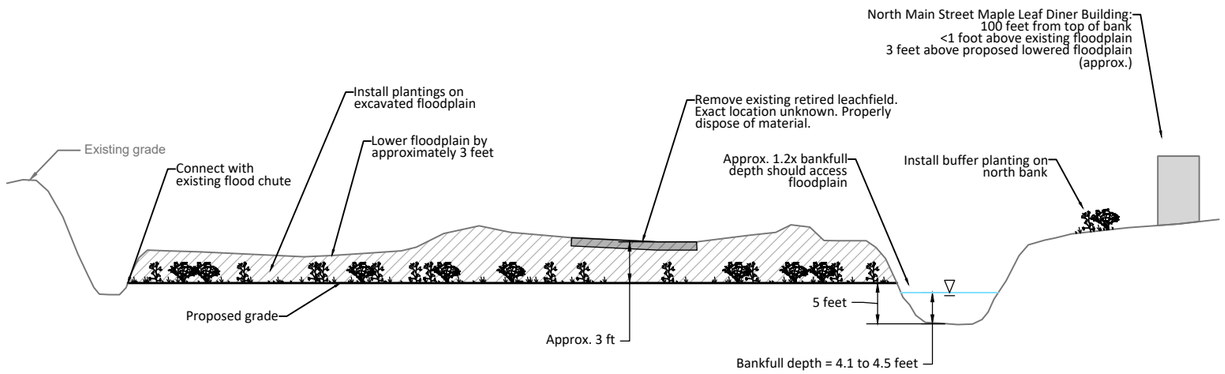
West River Phase II
Stream Geomorphic Assessment

MAP BY	CHECKED
JWC	JHB

SCALE: 1 inch = 100 feet

DATE: May 9, 2025

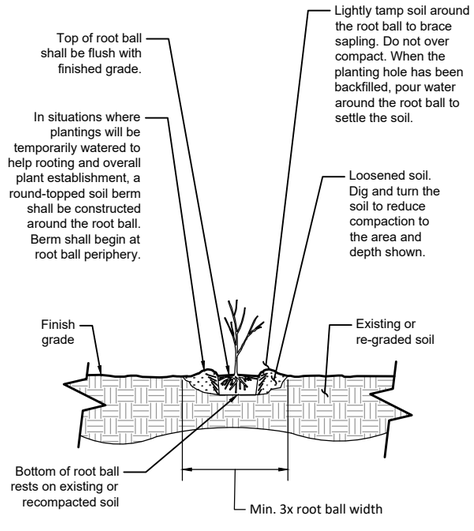
SHEET NO.: WR-11



Notes:

1. Hydraulic modeling should be completed to determine final elevation of floodplain cut
2. Location of existing retired leachfield should be determined prior to excavation
3. Cross section is vertically exaggerated and is not to scale

Floodplain Lowering - Typical Cross Section



Planting N.T.S

Preliminary Cost Opinion

Project WR-11

Item	Quantity	Unit	Unit Price	Cost
Mobilization/Demobilization	1	LS	$ 13,900	$ 13,900
Common Excavation	10200	CY	$ 20	$204,000
Hauling (onsite disposal)	10200	CY	$ 5	$ 51,000
Leachfield Material Disposal	50	CY	$ 80	$ 4,000
Plantings	680	EA	$ 15	$ 10,200
Misc. Erosion Control and Site Restoration	1	LS	$ 5,000	$ 5,000
Laborer	48	HR	$ 50	$ 2,400
Final Design & Permitting	1	LS	$ 10,000	$ 10,000
Construction Oversight	1	LS	$ 5,000	$ 5,000
			Subtotal	$305,500
			Contingency (20%)	$ 61,100
			Total	**$366,600**

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:

NOT FOR CONSTRUCTION

Conceptual Design Details
Project WR-11
Londonderry, VT
West River Phase II
Stream Geomorphic Assessment

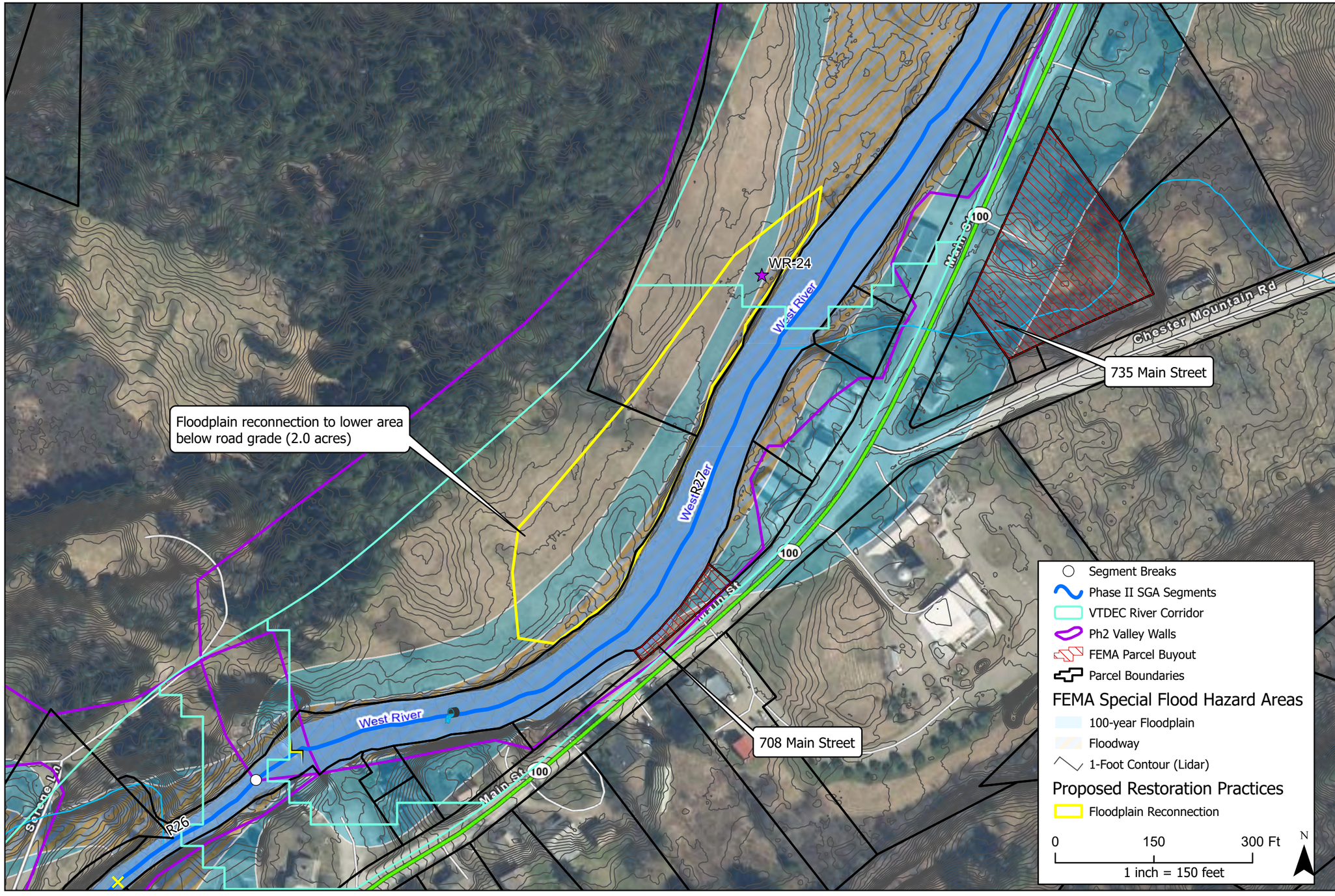
AEM DRAWN | JHB CHECKED

NOT TO SCALE SCALE

2025-05-09 DATE

WR-11 SHEET NO.

S:\2022\22012_VTDEC_WEST_RIVER_SGA\CAD\WESTRIVERSGACONCEPTS.DWG 5/9/2025 4:05:29 PM



Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:
-Contours are based on VCGI 0.7m LIDAR DEM (2013)
-Imagery is sourced from VCGI (2024)

Conceptual Design
Project WR-24
Weston, VT

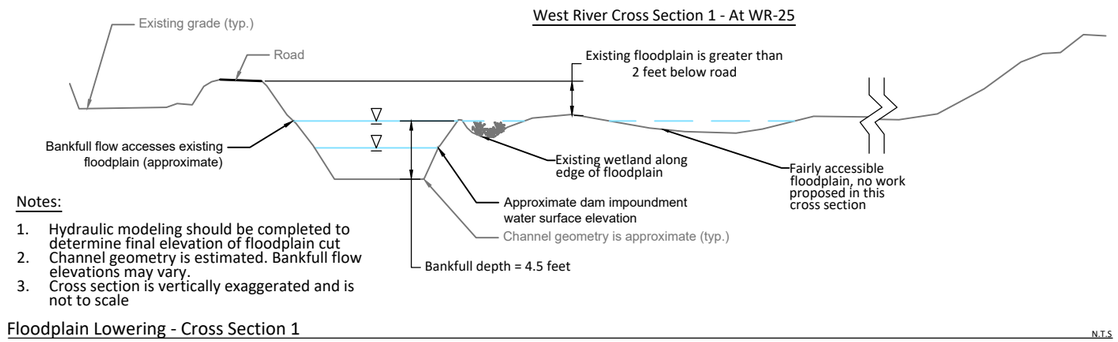
West River Phase II
Stream Geomorphic Assessment

MAP BY	CHECKED
LGO	JHB

SCALE: 1 inch = 150 feet

DATE: May 9, 2025

SHEET NO.: WR-24



Notes:

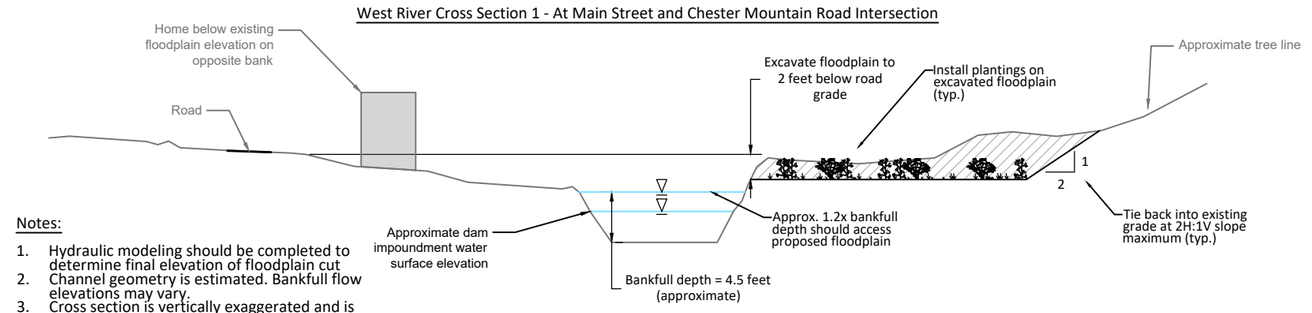
1. Hydraulic modeling should be completed to determine final elevation of floodplain cut
2. Channel geometry is estimated. Bankfull flow elevations may vary.
3. Cross section is vertically exaggerated and is not to scale

Floodplain Lowering - Cross Section 1 N.T.S

Preliminary Cost Opinion

Project WR-24

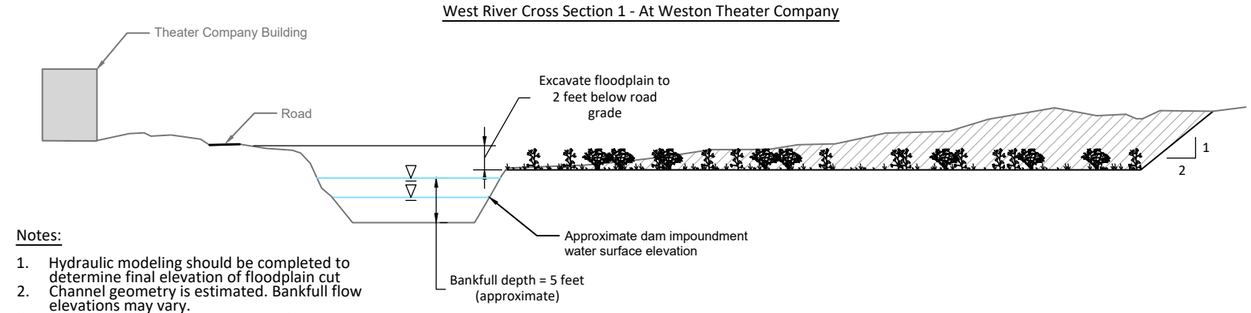
Item	Quantity	Unit	Unit Price	Cost
Mobilization/Demobilization	1	LS	$ 11,400	$ 11,400
Common Excavation	8100	CY	$ 20	$162,000
Hauling (onsite disposal)	9700	CY	$ 5	$ 48,500
Plantings	600	EA	$ 15	$ 9,000
Misc. Erosion Control and Site Restoration	1	LS	$ 5,000	$ 5,000
Laborer	48	HR	$ 50	$ 2,400
Final Design & Permitting	1	LS	$ 10,000	$ 10,000
Construction Oversight	1	LS	$ 5,000	$ 5,000
			Subtotal	$253,300
			Contingency (20%)	$ 50,660
			Total	**$303,960**



Notes:

1. Hydraulic modeling should be completed to determine final elevation of floodplain cut
2. Channel geometry is estimated. Bankfull flow elevations may vary.
3. Cross section is vertically exaggerated and is not to scale

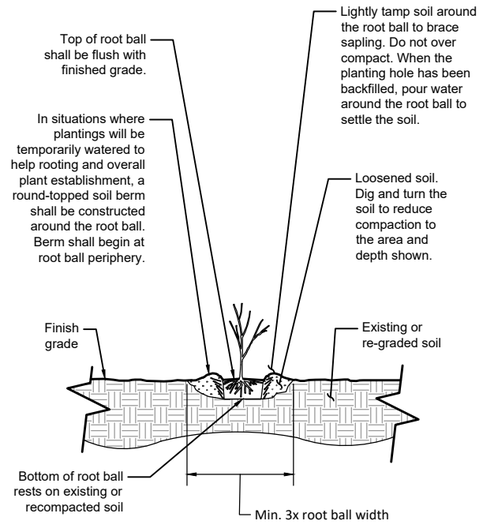
Floodplain Lowering - Cross Section 2 N.T.S



Notes:

1. Hydraulic modeling should be completed to determine final elevation of floodplain cut
2. Channel geometry is estimated. Bankfull flow elevations may vary.
3. Cross section is vertically exaggerated and is not to scale

Floodplain Lowering - Cross Section 3 N.T.S



Planting N.T.S

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:

NOT FOR CONSTRUCTION

Conceptual Design Details
Project WR-24
Weston, VT
West River Phase II
Stream Geomorphic Assessment

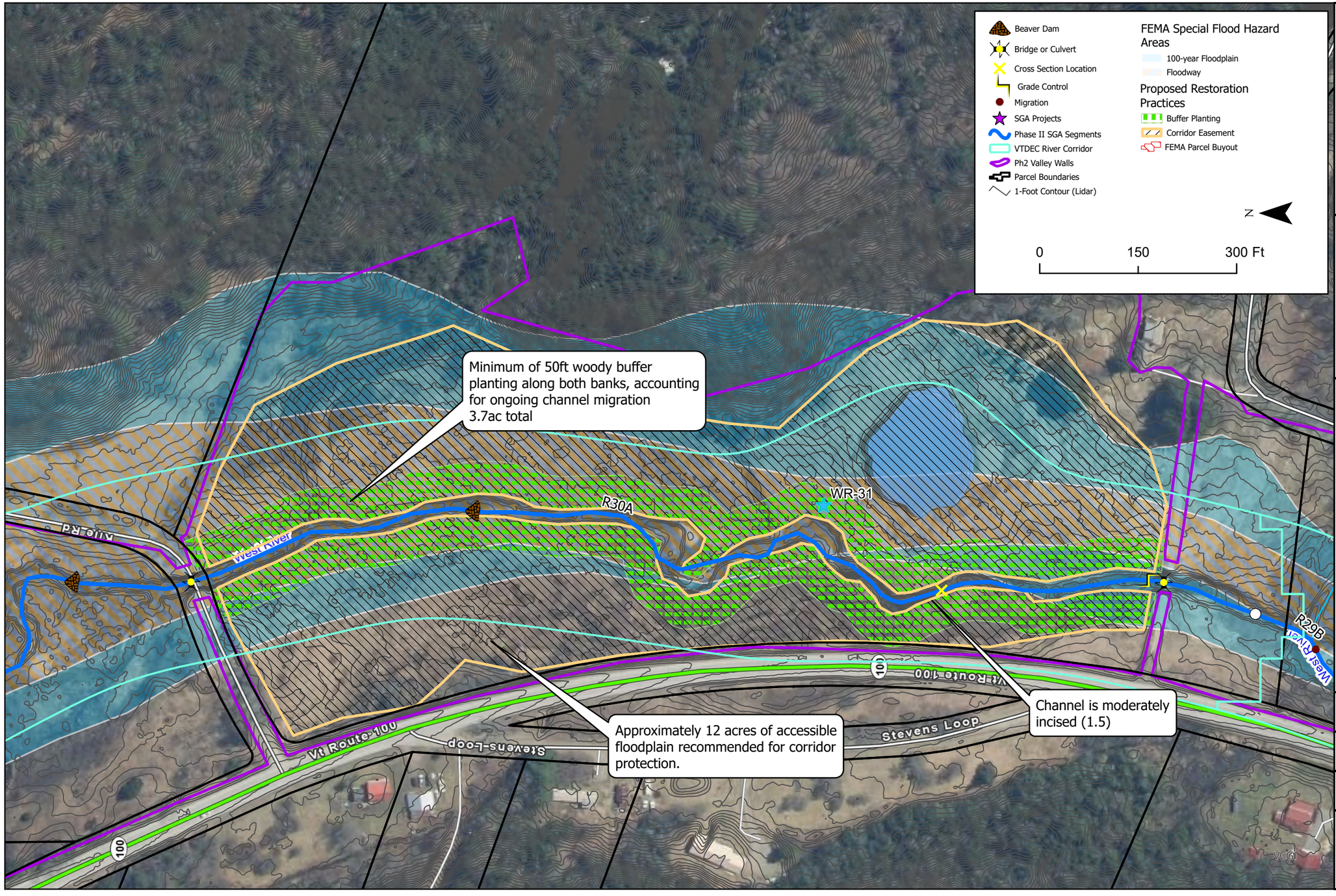
AEM	JHB
DRAWN	CHECKED

NOT TO SCALE
SCALE

2025-05-09
DATE

WR-24
SHEET NO.

S:\2022\22012_VTDEC_WEST_RIVER_SGA\CAD\WESTRIVERSGACONCEPTS.DWG 5/9/2025 4:05:30 PM



Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:
-Contours are based on VCGI 0.7m LIDAR DEM (2016)
-Imagery is sourced from VCGI (2024)

Conceptual Design
Projects WR-31
Weston, VT

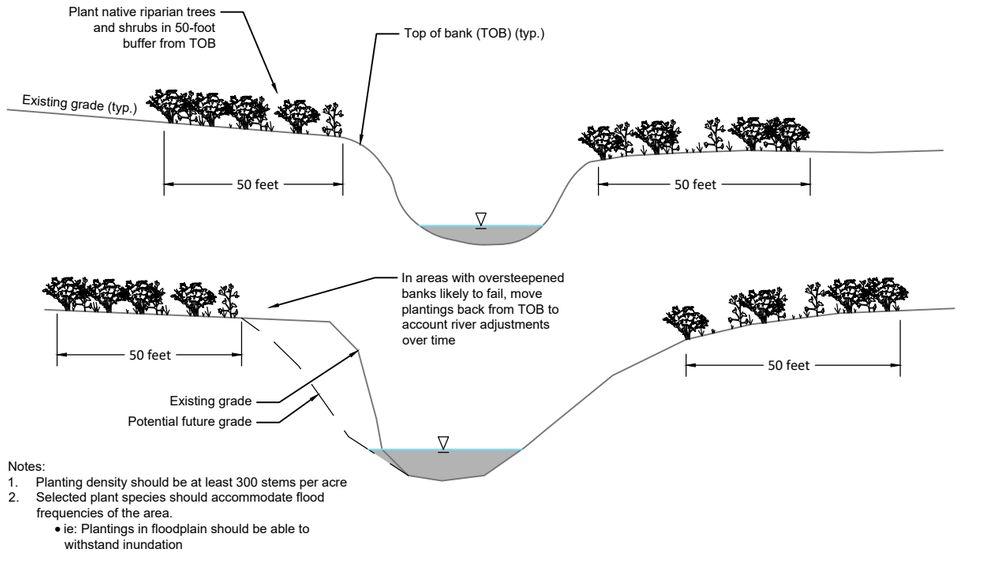
West River Phase II
Stream Geomorphic Assessment

JWC	JHB
MAP BY	CHECKED

1 inch = 150 feet
SCALE

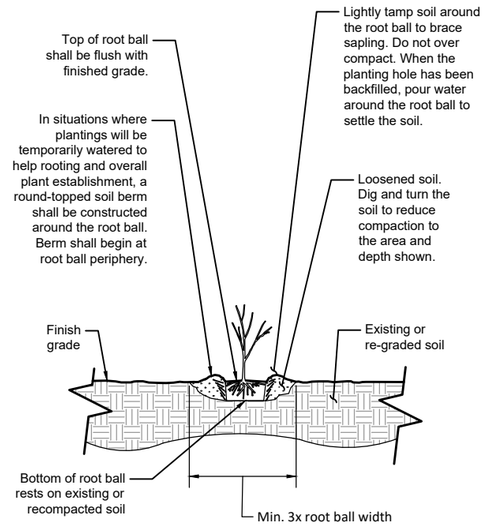
May 9, 2025
DATE

WR-31
SHEET NO.



Notes:
1. Planting density should be at least 300 stems per acre
2. Selected plant species should accommodate flood frequencies of the area.
   - ie: Plantings in floodplain should be able to withstand inundation

Planting Cross Sections N.T.S



Planting N.T.S

Preliminary Cost Opinion

Project WR-31

Item	Quantity	Unit	Unit Price	Cost
Mobilization/Demobilization	1	LS	$ 1,100	$ 1,100
Plantings	1100	EA	$ 15	$ 16,500
Laborer	80	HR	$ 50	$ 4,000
Easement	12	AC		$ -
			Subtotal	$ 21,600
			Contingency (20%)	$ 4,320
			Total	**$ 25,920**

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:

NOT FOR CONSTRUCTION

Concept Design Details
Project WR-31
Weston, VT
West River Phase II
Stream Geomorphic Assessment

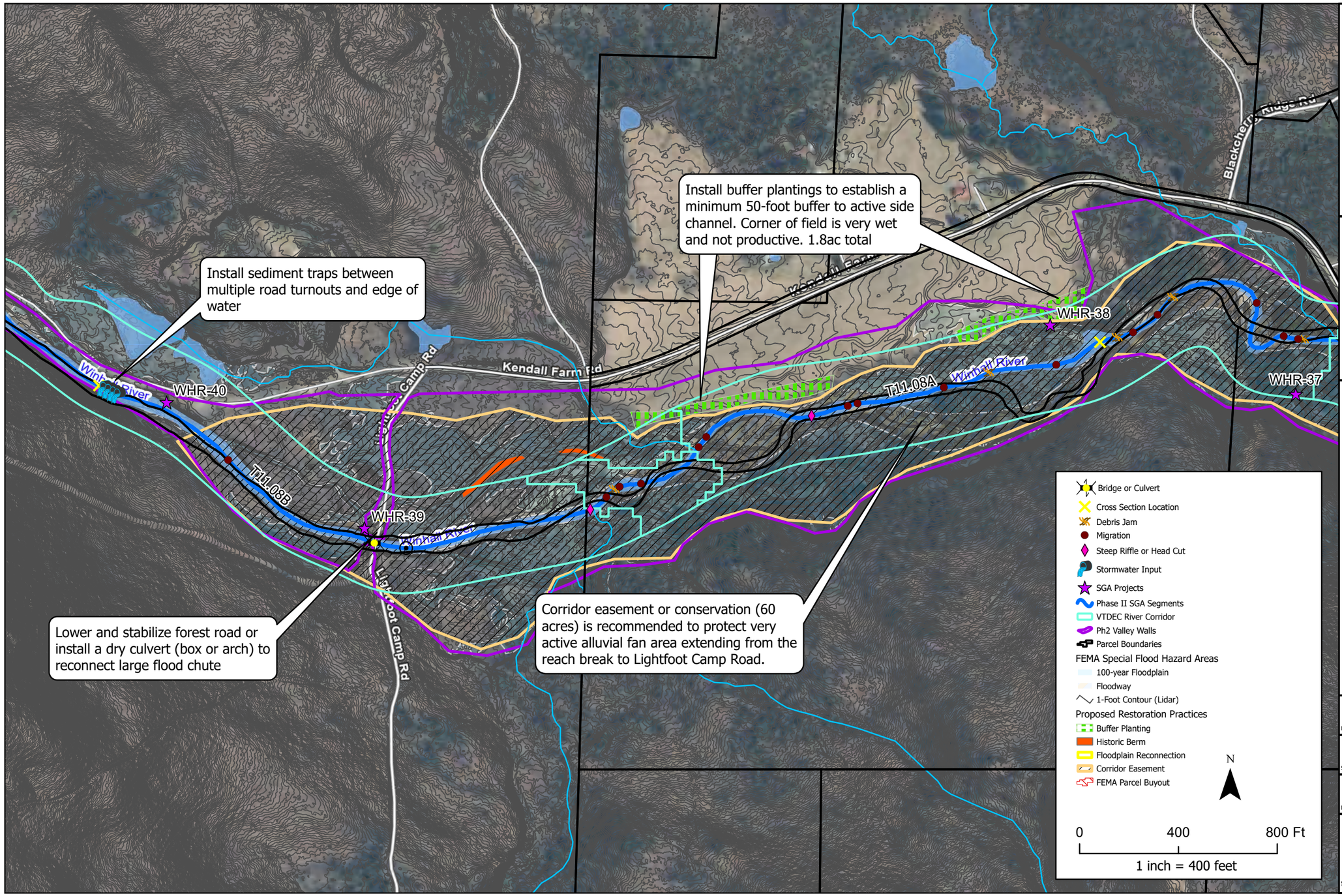
AEM	JHB
DRAWN	CHECKED

NOT TO SCALE
SCALE

2025-05-09
DATE

WR-31
SHEET NO.

S:\2022\22012_VTDEC_WEST_RIVER_SGA\CAD\WESTRIVERSGACONCEPTS.DWG 5/9/2025 4:05:35 PM



Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:
-Contours are based on VCGI 0.7m LIDAR DEM (2017)
-Imagery is sourced from VCGI (2024)

Conceptual Design
Projects WHR-37:40
Winhall, VT

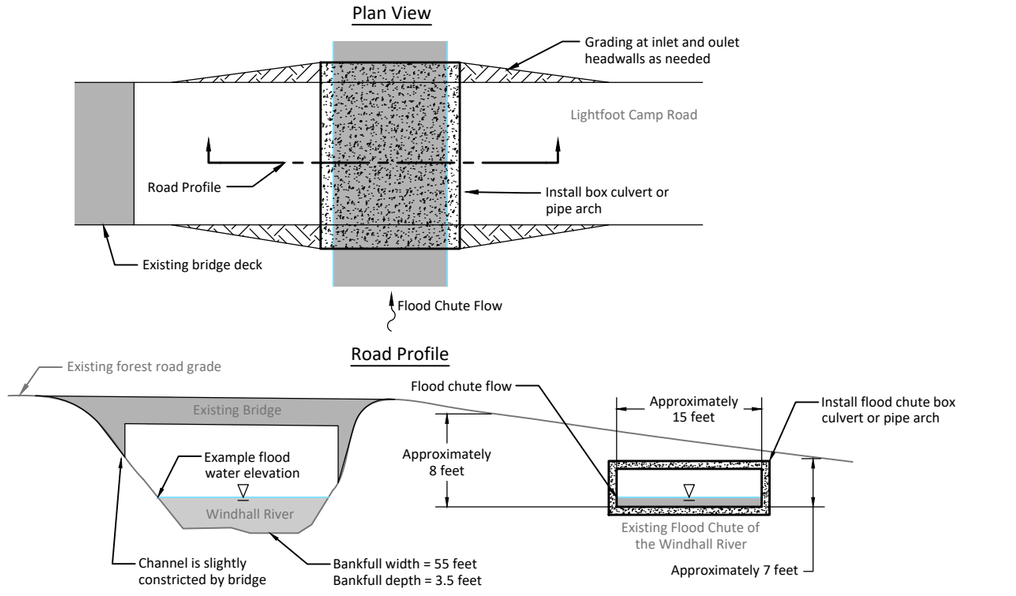
West River Phase II
Stream Geomorphic Assessment

MAP BY	CHECKED
LGO	JHB

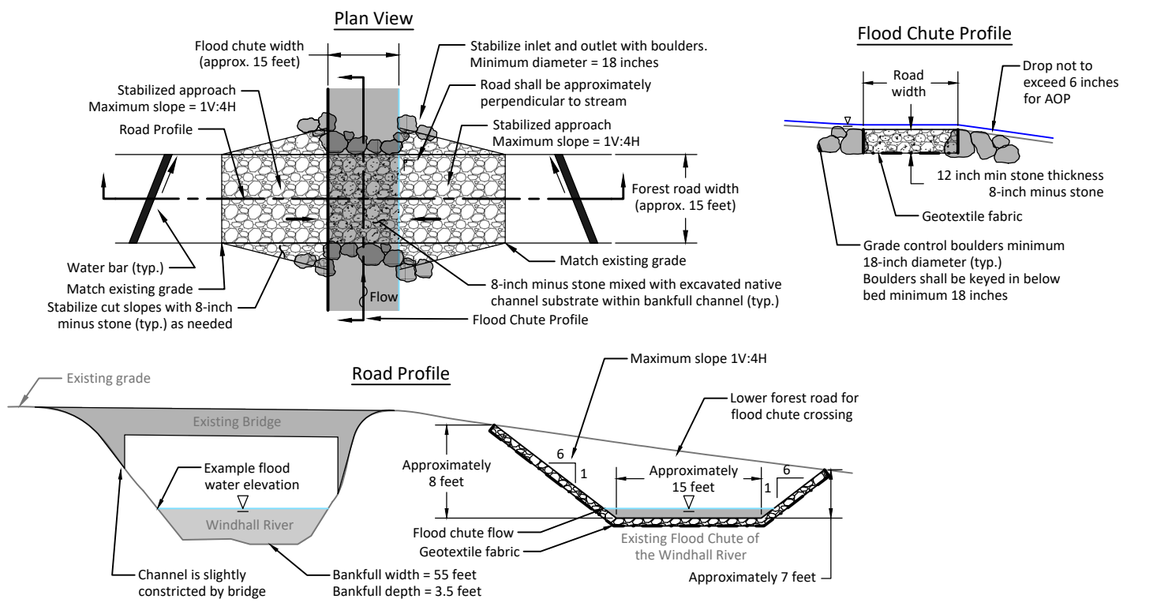
SCALE: 1 inch = 400 feet

DATE: May 9, 2025

SHEET NO.: WHR-37:40



Forest Road Crossing - Culvert Alternative N.T.S



Forest Road Crossing - Ford Crossing Alternative N.T.S.

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:

NOT FOR CONSTRUCTION

Concept Design Details 1
Projects WHR-37 & WHR-38 & WHR-39 & WHR-40
Winhall, VT
West River Phase II
Stream Geomorphic Assessment

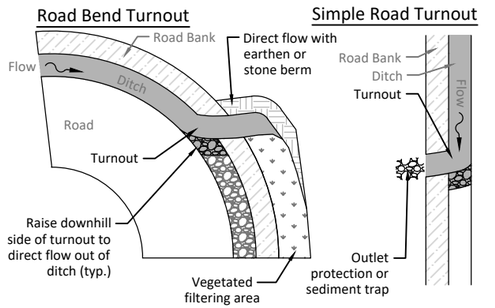
AEM	JHB
DRAWN	CHECKED

NOT TO SCALE
SCALE

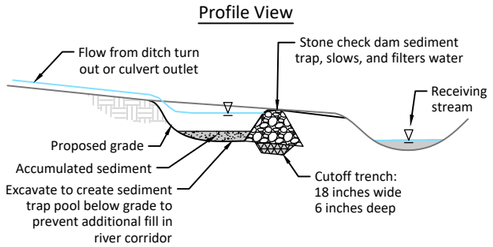
2025-05-09
DATE

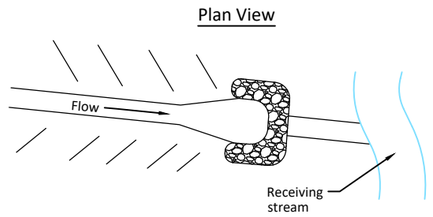
WHR-37:40
SHEET NO.

S:\2022\22012_VTDEC_WEST_RIVER_SGA\CAD\WESTRIVERSGACONCEPTS.DWG 5/9/2025 4:05:40 PM



Turnout N.T.S

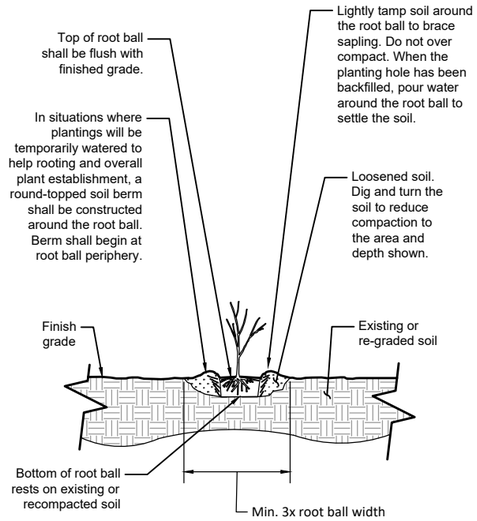




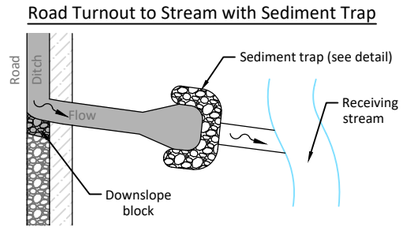
Notes:

1. Inspect annually and after large storms
2. Remove accumulated sediment when half full and dispose of properly in upland area then stabilize with seed and mulch.

Sediment Trap N.T.S



Planting N.T.S



Turnout N.T.S

Preliminary Cost Opinion

Project WHR-37, WHR-38, and WHR-39

Item	Quantity	Unit	Unit Price	Cost
Mobilization/Demobilization	1	LS	$ 8,300	$ 8,300
Flood Chute Box Culvert	1	LS	$150,000	$150,000
Sediment Trap	3	LS	$ 1,000	$ 3,000
Plantings	540	EA	$ 15	$ 8,100
Misc. Erosion Control and Site Restoration	1	LS	$ 2,000	$ 2,000
Laborer	24	HR	$ 50	$ 1,200
Final Design & Permitting	1	LS	$ 20,000	$ 20,000
Construction Oversight	1	LS	$ 8,000	$ 8,000
Easement	60	AC		$ -
			Subtotal	$200,600
			Contingency (20%)	$ 40,120
			Total	**$240,720**

*Road structure cost may vary depending on selected material and dimensions.

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:

NOT FOR CONSTRUCTION

Concept Design Details 2
Projects WHR-37 & WHR-38 & WHR-39 & WHR-40
Winhall, VT
West River Phase II
Stream Geomorphic Assessment

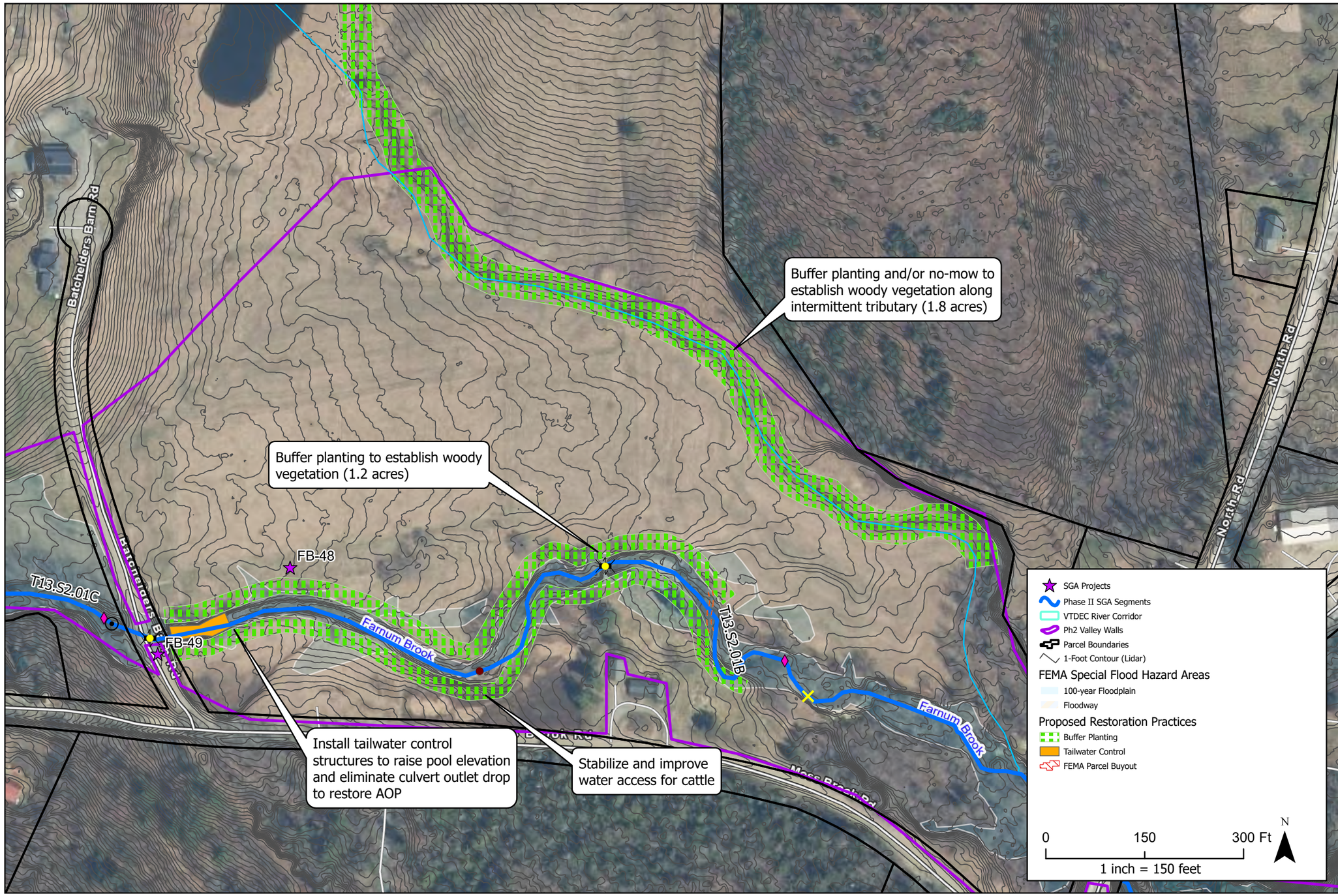
DRAWN	CHECKED
AEM	JHB

SCALE: NOT TO SCALE

DATE: 2025-05-09

SHEET NO.: WHR-37:40

S:\2022\22012_VTDEC_WEST_RIVER_SGA\CAD\WESTRIVERSGACONCEPTS.DWG 5/9/2025 4:05:40 PM



Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:
-Contours are based on VCGI 0.7m LIDAR DEM (2017)
-Imagery is sourced from VCGI (2024)

Conceptual Design
Projects FBT-48 & FBT-49
Peru, VT

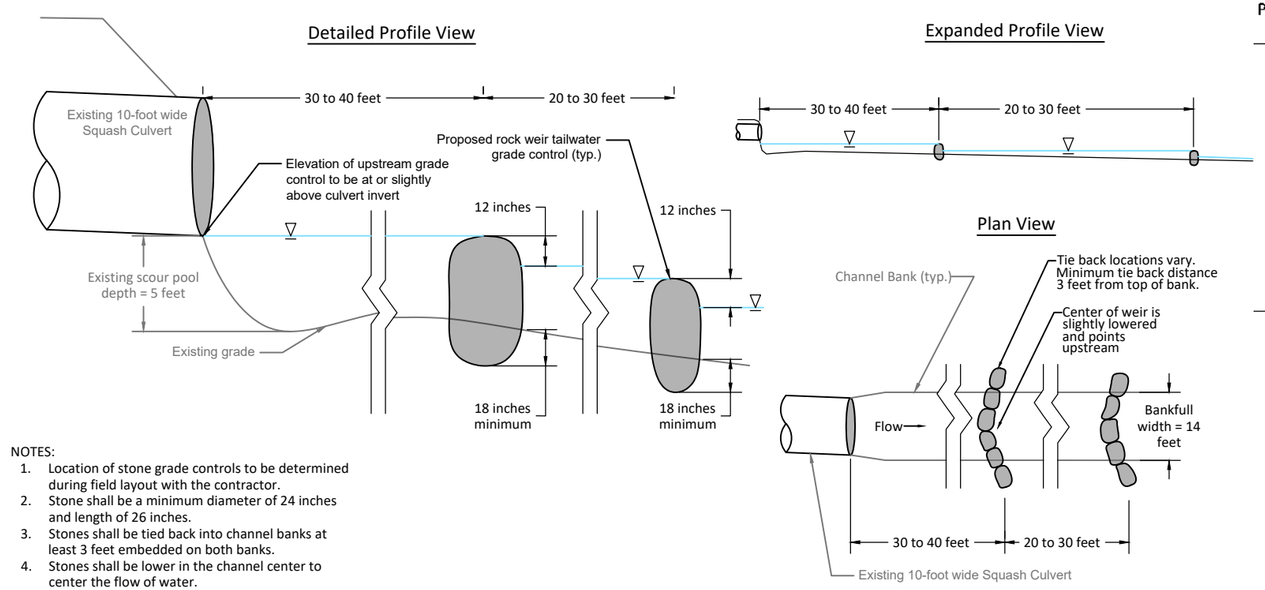
West River Phase II
Stream Geomorphic Assessment

MAP BY	CHECKED
LGO	JHB

SCALE: 1 inch = 150 feet

DATE: May 9, 2025

SHEET NO.: FBT-48 & 49



NOTES:

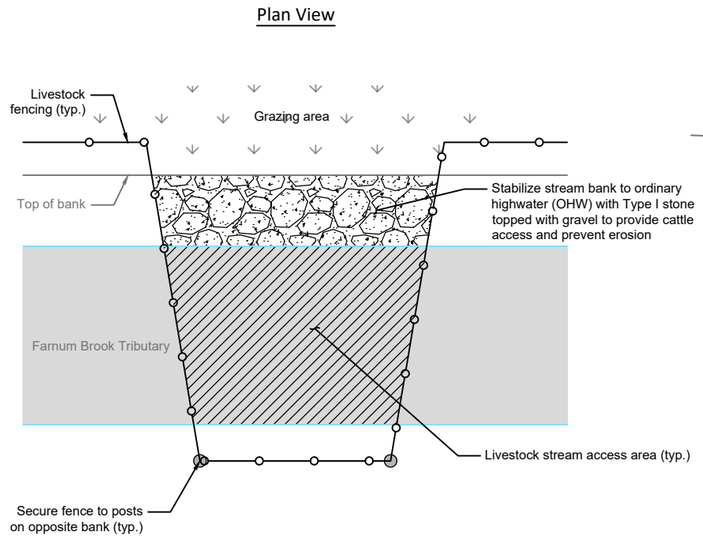
1. Location of stone grade controls to be determined during field layout with the contractor.
2. Stone shall be a minimum diameter of 24 inches and length of 26 inches.
3. Stones shall be tied back into channel banks at least 3 feet embedded on both banks.
4. Stones shall be lower in the channel center to center the flow of water.

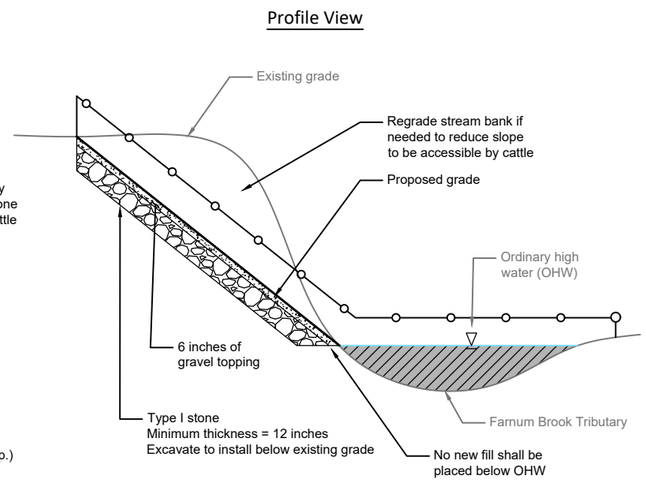
Rock Weir Tailwater Grade Controls

Preliminary Cost Opinion

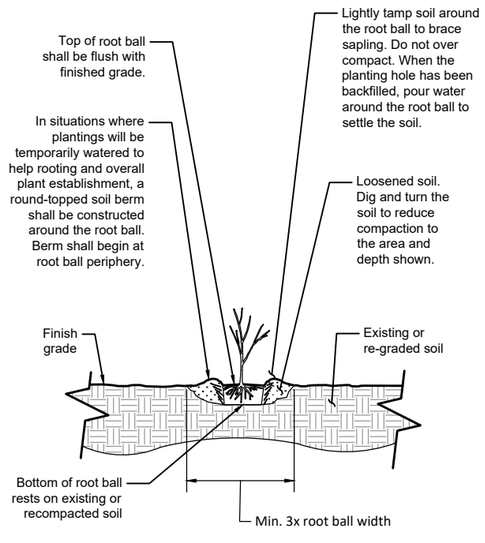
Project FBT-48 and FBT-49

Item	Quantity	Unit	Unit Price	Cost
Mobilization/Demobilization	1	LS	$ 1,500	$ 1,500
Common Excavation	25	CY	$ 25	$ 625
Cattle Access Type I Stone	15	CY	$ 80	$ 1,200
Cattle Access Gravel	10	CY	$ 80	$ 800
Rock Weir Grade Controls	2	LS	$ 5,000	$ 10,000
Plantings	600	EA	$ 15	$ 9,000
Control of Water	1	LS	$ 3,000	$ 3,000
Misc. Erosion Control and Site Restoration	1	LS	$ 2,000	$ 2,000
Laborer	48	HR	$ 50	$ 2,400
Final Design & Permitting	1	LS	$ 15,000	$ 15,000
Construction Oversight	1	LS	$ 8,000	$ 8,000
			Subtotal	$ 53,525
			Contingency (20%)	$ 10,710
			Total	**$ 64,235**





Cattle Stream Access Fencing and Stabilization



Planting N.T.S

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

Notes:

NOT FOR CONSTRUCTION

Conceptual Design Details
Projects FBT-48 & FBT-49
Peru, VT
West River Phase II
Stream Geomorphic Assessment

AEM	JHB
DRAWN	CHECKED

NOT TO SCALE (SCALE)

2025-05-09 (DATE)

FBT-48 & 49 (SHEET NO.)

S:\2022\22012_VTDEC_WEST_RIVER_SGA\CAD\WESTRIVERSGACONCEPTS.DWG 5/9/2025 4:05:35 PM