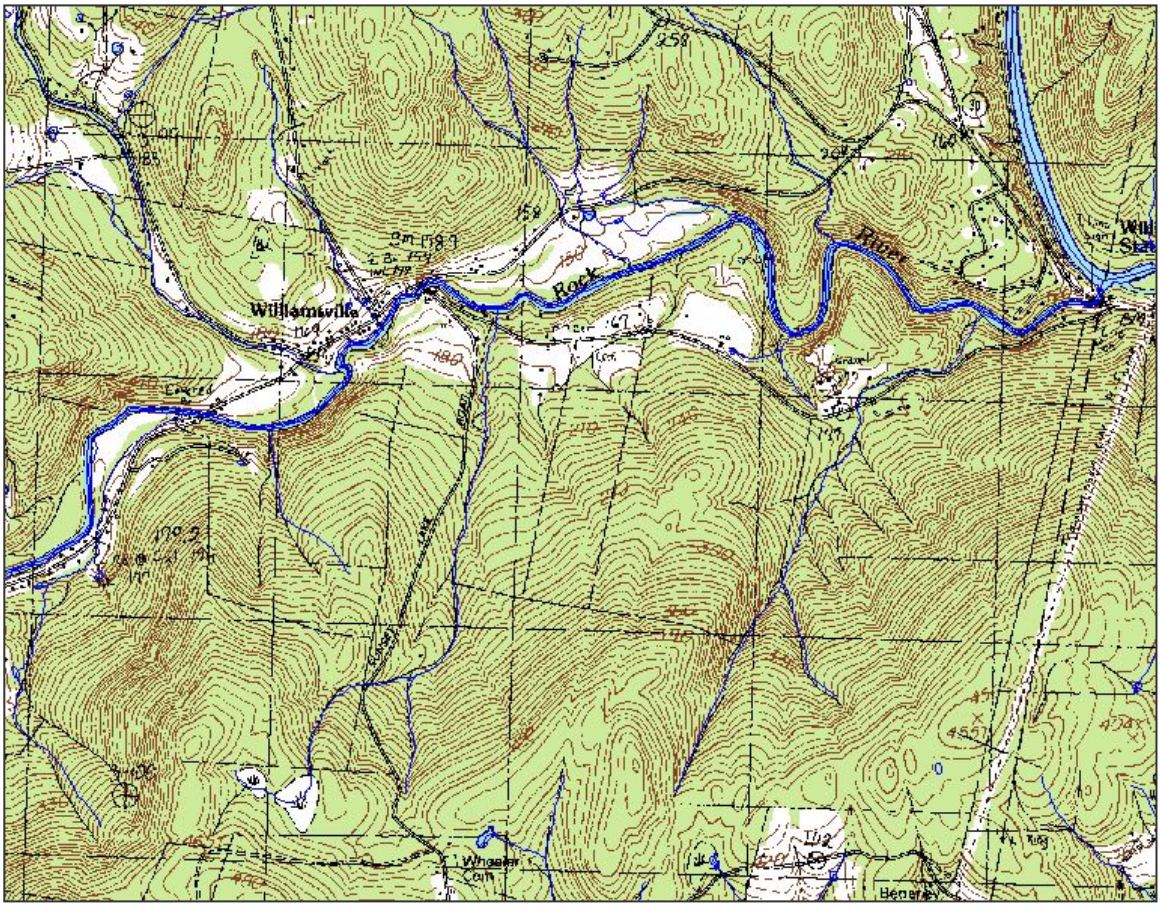
Phase 1 Stream Geomorphic Assessment Report

Rock River Watershed



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Acronym list:

VTANR……Vermont Agency of Natural Resources
VTDEC…….Vermont Department of Environmental Conservation
WRC…….Windham Regional Commission
NRCD……...Windham County Natural Resource Conservation District
SGAT……Stream Geomorphic Assessment Tool
NHD……..National Hydrography Dataset
DMS……..Data Management System
RIT……Reach Indexing Tool
USDA……United States Department of Agriculture
VCGI…….Vermont Center for Geographic Information

Abstract

The Phase 1 Stream Geomorphic Assessment of the Rock River is a process using remote sensing techniques to help determine the sensitivity to changes in the surrounding watershed. Various potential stressors, both human and natural, that occur within the system are evaluated. The Rock River is in a state of adjustment from historic land clearing and stream management practices. Using the parameters outlined in the Vermont Agency of Natural Resources Phase 1 Stream Geomorphic Protocol Handbook, the state of the stream is evaluated and the levels of potential impacts on that system are calculated. From these cumulative impact scores and the results of the parameter evaluations, stream reaches are recommended for the Phase 2 of the Stream Geomorphic Assessment, the stream reaches will be field assessed in greater detail in Phase 2 and recommendations for restoration and protection projects can be made.

1.0 Introduction

The following Phase 1 Stream Geomorphic Assessment was conducted on the Rock River main stem and major tributaries. Phase 1 is a general overview of the potential stressors influencing the watershed, providing background information and reference for the more detailed Phase 2 Assessment.

The primary goals were to do the following:

- Assess areas where potential erosion hazards exist that would affect public roads and access ways.
- Identify significant stressors, human and natural, within the sub-watersheds having a potential negative impact on the stream systems
- Calculate the potential level of impact for each designated stream section
- Determine where continued study should follow in the form of a Phase 2 Assessment.

The findings from these two assessments would be used by state, regional and local interested parties, including the towns of Newfane, Dover and Marlboro to identify locations for restoration and protection projects and local and regional planning.

Parameters assessed during the Phase 1 process were evaluated and impact ratings were calculated then assigned to each delineated stream reach. Parameters such as the preliminary reference stream type, land use, instream channel modification, and floodplain modification were examined. Each of these parameters has multiple aspects

and were assessed in detail using remote sensing techniques such as ArcView 3.3, 2003 NAIP orthophotos, 1998 Vermont orthophotos and topographic maps. Impact scores were assigned for each parameter based primarily on the level of human impacts, and partially on natural impacts, found in the stream area. These scores were then tallied to determine the total impact score for the reach.

1.1 Background

The Rock River is a tributary of the West River within Basin 11 in Windham County in southeastern Vermont. Its main stem totals a length of 12 miles and, with its tributaries, drains a total watershed size of 57 square miles within four townships. The Rock River divides into three branches of nearly equal size, the main stem, Baker Brook and the Marlboro Branch. This Phase 1 study includes these three branches and six major tributaries, as well as six minor tributaries that were noted as areas of concern.

In the nineteenth and twentieth centuries most of Vermont was clear cut for agricultural land use. Upland pastures and hill farming resulted in cleared hillsides and mountain tops. As agricultural practices and equipment evolved with the times more flat land was desired to maximize yields. River floodplains were prized as fertile areas for growing corn and hay crops. Originally horse drawn equipment had been used to access these areas that were often cut by meandering streams, however, with the arrival of tractors and larger equipment, smaller fields were considered unsuitable. In order to maximize the use of the bottom land in the valleys in the early 1900's, the Soil Conservation Service redirected many of the streams across the state so that they hugged the base of the valley wall. The Marlboro Branch of the Rock River shows evidence of this redirection in the wide valley reaches approaching the confluence with the Rock River main stem. These practices, meant to benefit farmers in an agrarian society were well intended. However, with the decline in agriculture throughout the twentieth century these practices began to demonstrate errors.

The constriction of the streams and rivers to a designated channel and the elimination of access to the floodplain has resulted in an increase stream velocity, triggering adjustment processes as the streams attempt to find a new state of equilibrium. These processes have resulted in further erosion of stream banks and valley walls within the river corridor as streams attempt to handle increased sediment loads and flow velocities.

The majority of the streams in the Rock River watershed have public roadways within the river corridor as well as residential developments that spread from the banks of the streams into the former floodplain. These areas are now prone to erosion hazards as the streams continue to adjust from historic land use changes.

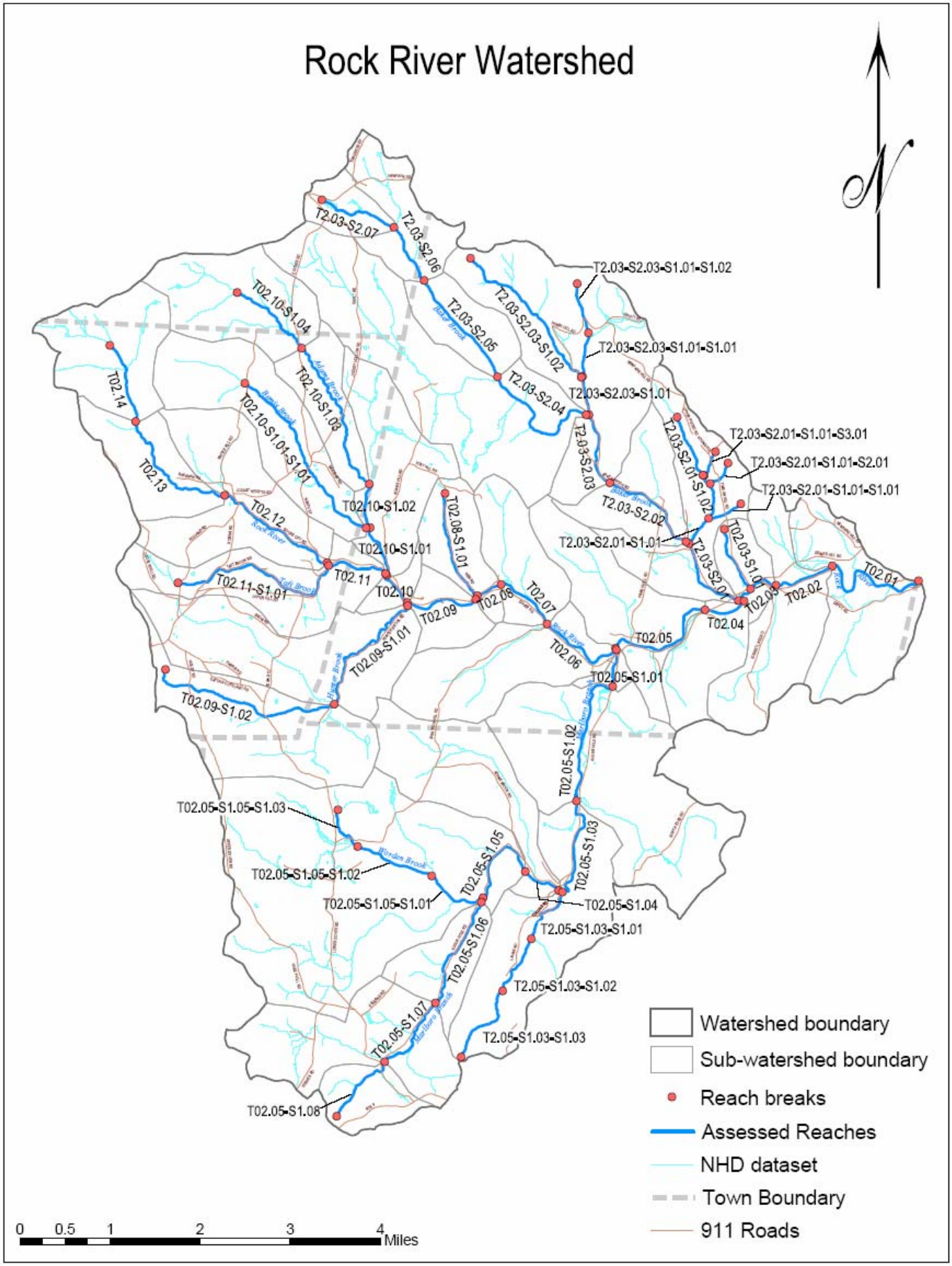

Figure 1.1: Map showing the delineated Rock River Watershed, selected Phase 1 reaches and reach breaks.

2.0 Methodology

The Phase 1 assessment conducted on the Rock River followed protocols dictated in the April 2005 Vermont Stream Geomorphic Assessment Phase 1 Handbook for Watershed Assessment published by the Vermont Agency of Natural Resources (VTANR). Once the primary watershed was determined, tributaries were selected based on two factors:

- If the size of the tributary's sub-watershed tributaries was an area 10% or greater of the total watershed
- If there was the observed potential for erosion hazards.

Streams with perceived erosion hazards were indicated by the Windham Regional Commission (WRC), the Windham County Natural Resources Conservation District (NRCD), and the VTDEC Basin 11 Watershed Coordinator. These recommended tributaries consisted of sections where known erosion hazards were impacting the public road systems.

Once tributaries were selected for a Phase 1 Assessment, they were divided into reaches. Divisions were determined by significant changes in valley width, slope, and geology and soil type. Each reach then underwent the Assessment process according to the VTANR Handbook Protocol. Reach sub-watersheds and numeric designations were delineated by the State's ArcView Extension program Stream Geomorphic Assessment Tool (SGAT) and entered into the State's online Data Management System (DMS).

The following Phase 1 tasks were completed with training and technical assistance from the Vermont DEC River Management Division:

- Delineated and numbered 54 stream reaches within the watershed
- Created GIS maps of watershed showing reach boundaries
- Reviewed orthographic photos, topographic maps
- Conducted windshield survey of each reach filling out field data sheets
- Compiled data in SGAT database and State DMS
- Submitted data for State DEC quality control check
- Generated Phase 1 reach reports

2.1 Database Development

Developed by the State to facilitate data analysis, data calculations and measurements, the State's ArcView extension SGAT is operated in a series of steps. The steps within the extension identify types of information needed to determine the condition and sensitivity of the stream reaches within the watershed. In following this "step-by- step" system for the Rock River assessment, information was entered that identified general location information, valley characteristics, (valley slope, valley width, and the degree to which the stream is confined), geology and soils data, land cover and land use. Most of the data entered into the database was gathered from remote sources, such as topographic maps

and orthographic photos. A windshield survey, in which accessible reaches were assessed by car, was conducted to obtain preliminary data as well as to check the calculated data against real situations (ground-truthed).

2.2 Quality Control

Data was reviewed and updated to reflect existing conditions. The SGAT extension automatically populated database tables that were then imported into the State's Phase 1 DMS. The DMS calculated the sensitivity and impact rating for the individual stream reaches. State VTDEC Quality Assurance staff reviewed the data on-line for quality control purposes.

3.0 Results

To assess the impacts on a stream many factors must be taken into consideration. The current state of adjustment of the stream must be analyzed in order to understand how the stream is being impacted by human activities as well as natural processes. There were seven total steps in which data was inputted into the online DMS for the Phase 1 assessment. Each step helped to describe a different aspect of the watershed and was used to calculate the final impact score for each reach.

3.1 Step 1. Reach Location

Step one consisted of defining reach names and locations. Reach identification numbers were correlated to the local stream name, if known, and the town in which that it was located in. If the stream name was unknown it was either named after a road running parallel to it, or another identifying factor such as "East Branch."

3.2 Step 2. Preliminary Reference Stream Type

Step two involved the determination of a preliminary reference stream type for each reach. The preliminary reference stream type is meant to describe the stream channel forms that would exist in an environment that was not impacted by human changes (see table 3.1.1). Stream characteristics such as elevation changes; valley length, slope, and width; channel length, slope and width; and stream sinuosity are taken into account to determine the reference stream type and bed form description. These characteristics were measured by using remote sensing tools such as the 2003 NAIP orthophotos, 1998 Vermont orthophotos, and topographic maps. The preliminary reference stream type for each reach is further refined with the evaluation of the other parameters in the subsequent steps of the Phase 1 assessment.

Table 3.2.1: Phase 1 – Reference Stream Typing Chart

Reference Stream Type	Confinement (Valley Type)	Valley Slope	Bed Form
A	Narrowly confined (NC)	Very Steep > 6.5 %	Cascade
A	Confined (NC)	Very Steep 4.0 - 6.5 %	Step-Pool
B	Confined or Semi-confined (NC, SC)	Steep 3.0 - 4.0 %	Step-Pool
B	Confined or Semi-confined or Narrow (NC, SC, NW)	Mod.- Steep 2.0 – 3.0 %	Plane Bed
C or E	Unconfined (NW, BD, VB)	Mod.- Gentle < 2.0 %	Riffle-Pool or Dune-Ripple
D	Unconfined (NW, BD, VB)	Mod.- Gentle < 4.0 %	Braided Channel

*Table 2.2 VTANR Phase 1 Protocol Handbook

Table 3.2.2 Summary of Stream types for Rock River

Stream type	A	B	C	D	E
Number of Reaches	23	18	13	0	0
Percentage of the total (54 reaches)	42%	33%	24%	0%	0%

The stream types assigned to reaches in step two describe the basic principles of how streams transport water and sediment out of their respective watershed. They also reflect the stability of the stream section.

The Rock River is primarily dominated by “A” stream types, ranging from very steep (>6.5% grade), narrowly confined valleys with a cascade bed form to very steep (4.0-6.5% grade) confined valleys with a step-pool bed form. These stream types typically exist in the upper reaches of the three main branches as well as the upper reaches of the tributaries assessed. “A” type streams are usually confined by steep valley walls and slope. They also tend to have bedrock grade controls frequently throughout the reach resulting in the cascade or step-pool bed forms. These streams are fairly stable in their channel location due to these bedrock grade controls. The streams will slowly over hundreds of years wear away the bedrock’s weaker areas such as fractures, joints and softer layers and continue to cut through the valley. Headwaters of streams and rivers descending mountain slopes tend to be designated “A” stream types.

“B” stream types range from confined, or semi-confined to narrow with valley slopes ranging from steep (3.0-4.0% grade) with a step-pool bed form, to moderate to steep (2.0-3.0% grade) with a plane bed bed form. A plane bed bed form means that there is no dominant bed form present. As streams come out of the upper headwaters and begin to

enlarge due to the expanding width of the valley bottom and minor tributary and ground water inputs they move into “B” stream types. This stream type is not limited to occurring just below “A” stream types. As valley widths increase and decrease stream types alter accordingly. Therefore “B” stream types are scattered throughout the watershed. “B” stream types are also confined to narrow valleys, though they are not as steep or narrowly confined as “A” stream types. Due to the natural confinement of the valley walls “B” stream channels are fairly stable, meandering slowly, if at all along the valley floor.

The final stream type found in the Rock River Watershed is the “C” stream type, an unconfined section of stream with a moderate to gentle (<2.0% grade) valley slope and a riffle-pool bed form. This stream type is primarily found in the more open valleys where agriculture and residential areas are usually found. In this wider section of valley the stream typically, under ideal circumstances, would be able to dissipate energy and sediment by meandering across the valley floor. “C” stream types are also found scattered throughout the watershed in the wider valley bottoms. The stability of the channel in a “C” type stream section is less than the other defined stream types. The material found in the valley bottoms consists of unconsolidated fluvial deposits placed by the stream as it meanders. As the stream continues to meander across the valley bottom, it moves through this material, causing it to erode easily.

3.3 Step 3. Basin Characteristics: Soils and Geology

Along a reach, the steepness of the valley slope and the degree of confinement by the valley walls will affect how fast the steam will transport sediment and water. The transport of sediment and water is also dependent on the surrounding geology and hydrology. The amount of sediment available to be transported is based on the characteristics of the soils and geology that the stream runs through. Sediment composition is dependant on the soil types, as well as the underlying unconsolidated sediments, or surficial geology that overlay the bedrock in the watershed area. Typically in Vermont the surficial geology is glacial till consisting of gravels, sands, clays and silts. This material is highly erodible and makes up the stream banks and valley slopes of much of Vermont’s landscape.

Unlike bedrock valleys which do not erode easily and typically result in narrowly confined, type A streams with cascade or step-pool bed forms, valleys with more highly erodible material result in “B” and “C” type streams with a much larger sediment transport ability. The “B” and “C” stream types exist in wider valleys where the stream banks and valley slopes are made up of this loose surficial geology. Typically this is where most residential and commercial development occurs, which ends up restricting the stream to a permanent channel location. Under ideal conditions these types of streams would be able to meander over the valley floor, dissipating their energy and sediment load along meander bends. When the stream is channelized in these highly erodible surficial deposits, the velocity of the stream is increased and high flow occurrences, such as storm events, can result in drastic changes in the stream channel and its location over a very short period of time.

In step three the geology and soils of the Rock River watershed were assessed primarily using the Stream Geomorphic Assessment Tool (SGAT), pulling data from the NRCS digital soil survey. There is a large amount of bedrock exposed throughout the reaches surveyed, forming grade controls on the streams. However, the dominant geology in the Rock River watershed is glacial till, which is not nearly as stable and will yield soils that are far more prone to have erosion problems. Based on the dominant and sub-dominant geology, valley side slopes and soil properties, an erodibility level was determined for each reach assessed.

Table 3.3.1 Summary of Erodiblity of Material in the Rock River Watershed

Erodibility level	Very Severe	Severe	Moderate	Slight
Number of Reaches	36	12	5	1
Percentage of the total (54 reaches)	67%	22%	9%	2%

Soil types present in the Rock River watershed are from four major soil complexes found in Windham County. Soil descriptions are based on the USDA Soil Survey of Windham County Vermont.

- **Colton-Adams-Podunk Complex**: In the lower reaches of the three main branches, the Rock River main stem, Baker Brook and the Marlboro Branch, the Colton-Adams-Podunk complex is dominant. Found on stream terraces and flood plains, this complex consists of soils that are very deep, gently sloping to very steep, excessively drained to moderately well drained and formed in cobbly, gravelly and sandy glaciofluvial deposits and in loamy alluvium.
  Colton characteristics:
  - The excessive drainage in this soil makes it prone to drought conditions
  - Erosion is a hazard
  - Due to the poor filtering capacity it is also a poor area for septic absorption fields. If used as such there is potential for groundwater contamination due to the soils ready absorption of effluent, but inadequate filtering ability.

- **Tunbridge-Marlow-Lyman Complex**: Is found on the upper hillsides of the lower stream reaches in the eastern half of the watershed. A complex of very deep to shallow, gently sloping to very steep, excessively drained to well drained soils that formed in loamy glacial till and in compact, loamy glacial till.
  Tunbridge characteristics:
  - Generally stony soils with depth to bedrock ranging from 27 inches to 15 inches with increasing slope

- Use for dwellings and septic fields is limited by depth to bedrock in the Tunbridge and Lyman soils, and by the seasonal high water table and low permeability of the Marlow soils

- **Houghtonville-Rawsonville-Mundal Complex**: Is found in the western half of the watershed in the higher elevations and the upper reaches of the Rock River and its assessed tributaries. A complex of very deep and moderately deep, gently sloping to very steep, well drained to moderately well drained soils that formed in loamy glacial till and in compact loamy glacial till.

  Houghtonville characteristics:
  - Found on the slopes of mountains, hills and knolls around the watershed
  - Unsuitable for development and forest management due to the steep slopes it is found on, and erosion hazards

  Rawsonville characteristics
  - Found beneath the Houghtonville soils on the summits, shoulders and back slopes of hills and mountains.
  - Unsuitable for development due to slope, depth to bedrock, erosion hazard and equipment limitation.
  - Difficult forest management due to windthrow hazards and equipment limitations

  Mundal characteristics:
  - Found on shoulders and back slopes of mountains and hills
  - Steep to very steep, well drained and stony
  - Unsuitable for dwellings or forest management due to slope, and erosion hazard

- **Stratton-Glebe-Londonderry Complex**: Found in the headwaters of the Rock River main stem on the peaks of Rice Hill and Whites Hill. This set of soils is found to be moderately deep to very shallow, strongly sloping to very steep and well drained that formed in loamy glacial till.
  - Forest management concerns are erosion hazards, equipment limitation due to slope and soils, and windthrow hazards.
  - Unsuitable for dwellings due to slope and depth to bedrock

The soils in the watershed that are found on steeper slopes tend to be more prone to erosion problems, according to the Highly Erodible Land (HEL) data noted in the top20 data available with the digital soils data created by the NRCS and downloadable from VCGI. Highly Erodible Land (HEL) is soil erodibility factor which represents both susceptibility of soil to erosion and the rate of runoff, as determined by the USDA Natural Resource Conservation Service (NRCS). The NRCS uses a number of equations, including the Universal Soil Loss Equation (USLE) to determine, for each map unit, a relative index of susceptibility of bare, cultivated soil to particle detachment and transport by rainfall.

This value is for the erosion caused by overland flow on unvegetated soils and does not directly indicate the erodibility of the soils as it relates to the power of the stream working on them. So be aware that a soil type that is listed as being "not highly erodible" may still erode when a stream is working against it. Contact NRCS soil scientists for more information about soil erodibility

Shallow soils found in the headwaters of the Rock River and its tributaries are all very rocky and the depth to the bedrock is minimal, so erosion and windthrow are both hazards. Other areas that are considered to be highly erodible are areas with steeper valley walls, creating an unstable environment in the soft soils, and areas where the river was previously allowed to meander. In these wider valleys the soils and surficial geology are not stable and can easily be eroded by fluvial processes.

Table 3.3.2 – EXAMPLES OF ERODIBLE REACHES IN THE ROCK RIVER WATERSHED

Reach description	Soil type	HEL Erosion Susceptibility
T02.01: Mouth of the Rock River	Colton/Adams	Very Severe: Low permeability, droughts
T02.03: Rock River main stem, Williamsville Village	Colton/Adams	Very Severe: Low permeability, droughts
T02.03.S1.01: Timson Hill Rd tributary	Berkshire/Westbury	Very Severe: Windthrow, Seasonal high water table
T2.03-S2.01-S1.01: Newfane Hill tributary off of Baker Brook	Colton/Berkshire	Very Severe: Low permeability, Windthrow
T2.03-S2.02: Baker Brook, near Parish Hill Rd	Berkshire/Colton	Very Severe: Erosion, Low permeability
T2.03-S2.03-S1.01: Baker Brook tributary	Berkshire	Very Severe: Erosion, Windthrow
T02.05-S1.06: Marlboro Branch upstream of Worden Brook	Rawsonville/Mundal	Very Severe: Erosion, Depth to bedrock
T02.05-S1.08: Marlboro Branch headwaters	Rawsonville-Hogback	Very Severe: Steep slope, Depth to bedrock
T02.08-S1.01: New Road tributary	Houghtonville	Very Severe: Steep slope, Erosion

Reach description	Soil type	HEL Erosion Susceptibility
T02.09: Rock River main stem below Brookside	Colton/Mundal	Very Severe: Low permeability, Erosion
T02.09-S1.01: Hunter Brook downstream of Brookside	Houghtonville/Mundal	Very Severe: Steep slope, Depth to bedrock, Erosion
T02.09-S1.02: Hunter Brook headwaters	Houghtonville/Mundal	Very Severe: Steep slope, Depth to bedrock, Erosion
T02.10: Rock River main stem through Brookside	Colton/Houghtonville	Very Severe: Low permeability, Erosion
T02.11-S1.01: Taft Brook along Taft Brook Road, Dover	Houghtonville/Rawsonville/ Worden	Very Severe: Steep slope, Depth to bedrock, Erosion
T02.13: Rock River main stem Green Mountain National Forest	Houghtonville-Rawsonville/Mundal	Very Severe: Steep slope, Depth to bedrock, Erosion
T02.14: Rock River main stem headwaters, Green Mountain National Forest	Rawsonville-Hogback	Very Severe: Steep slope, Depth to bedrock

Due to the severe erodibility of the material in the watershed it can be expected that events such as heavy rains, uncontrolled runoff and flooding can have a serious impact on the stream and the surrounding area. There are natural systems that exist to minimize erosion, however. Types of land cover, land use and other hydrologic features can help to control sediment loss where erosion is considered a hazard. The Phase 1 assessment analyzed land cover and reach hydrology in the watershed and stream corridors of the reaches.

3.4 Step 4. Reach Hydrology, Land Cover and Land Use

The clearing of land for agricultural purposes in the past affected the water and sediment inputs to the surrounding streams. These changes initiated adjustment processes that are still continuing today. As floodplains and river corridors were claimed for cropland, and the channels were forced to the valley edges, allowing for maximum use of the valley floor, the rivers and streams continued to try to adjust to these new impacts. These practices of the past resulted in channelization of the streams and an increase in flow velocity changing the state of the stream from a point of equilibrium to various stages of adjustment processes.

In step four land cover and land use along the river corridor, as well as in the entire watershed area, was assessed. The pre-colonial cover and usage of the majority of the watershed was forest. Only in the last few centuries has the land use and cover changed. Currently the watersheds of the reaches surveyed have a majority of forest land cover. However, in the river corridors the reaches showed a higher percentage of urban land cover and land use. With the decline of agricultural lifestyles in the area, many previously agricultural areas have either been converted to residential development, or have been allowed to regrow as new growth forest as area hill farming was abandoned. Residential development, villages, and roads are described as urban land use.

A riparian condition summary was also conducted in step four using remote sensing techniques. Riparian buffer systems are defined by the VTANR as:

"The width of land adjacent to lakes or streams between the top of the bank or top of slope or mean water level and the edge of other land uses. Riparian buffer zones are typically undisturbed areas, consisting of trees, shrubs, groundcover plants, duff layer, and a naturally vegetated uneven ground surface, that protect the waterbody and the adjacent riparian corridor ecosystem from the impact of these land uses." (Torti, VTANR, 2005)

Using ArcView 3.3 with the 2003 NAIP digital orthophotos as well as the 1998 Vermont orthophotos, the widths of riparian buffers in the river corridors were assessed. Stream sections that had minimal riparian buffer systems fell along areas with increased development in the river corridor, such as roads and residential areas (see Figure 3.1.1). Developments within the river corridor are factors that influence changes in the stream. They determine how functional the floodplain is that the stream has access to.

Public and private roads are infrastructure that, when built within the river corridor, often constrict the movement of the stream by eliminating access to the floodplain. As a stream attempts to meander during the adjustment process it may undermine infrastructure and cause damage. Repairs such as rip-rap, berms and concrete revetments are installed to protect the roads and in turn limit the movement of the stream. Along the Rock River and its tributaries there are large sections where the stream has been confined by such infrastructure. Along the Marlboro Branch, Auger Hole Road runs along the edge of the stream and has been historically fortified by berming. Baker Brook and Baker Brook Road have a similar relationship with corridor developments occurring along the entirety of the lower three reaches. Minimal buffer strips in these areas increase the likelihood of damage to infrastructure by erosion as the stream adjusts. In these areas there is also evidence of historic flood chutes. A stream creates flood chutes during times of high flow when the water levels exceed the bank height. They often will cut across portions of river bends. Roads that have been constructed within the river corridor often cut off the streams' access to these flood chutes, continuing to limit the streams' movement, and exposing the road to potential damage from floods.

Types of river corridor development also have a strong influence on the water runoff that flows into the stream. Amounts of runoff will differ from agricultural areas, from roads and from residential areas, but all can result in erosion of the stream banks, and pollution

without a buffer strip. Land cover and land use can be altered to help to control sediment loss where erosion is considered to be a hazard. Planting buffer strips along roads and the edges of residential areas reduces the potential for erosion. In residential areas attractive plants and shrubs can be used instead of mowing to the edge of the river bank. Buffer strips provide a larger area for runoff to filter through, minimizing the amount of pollutants entering the stream system.

Increasing the percentage of stream length that has a healthy riparian buffer system assists in increasing bank integrity and preventing collapse, as well as improving water quality. Please refer to the printed reports in Appendix A for further details.

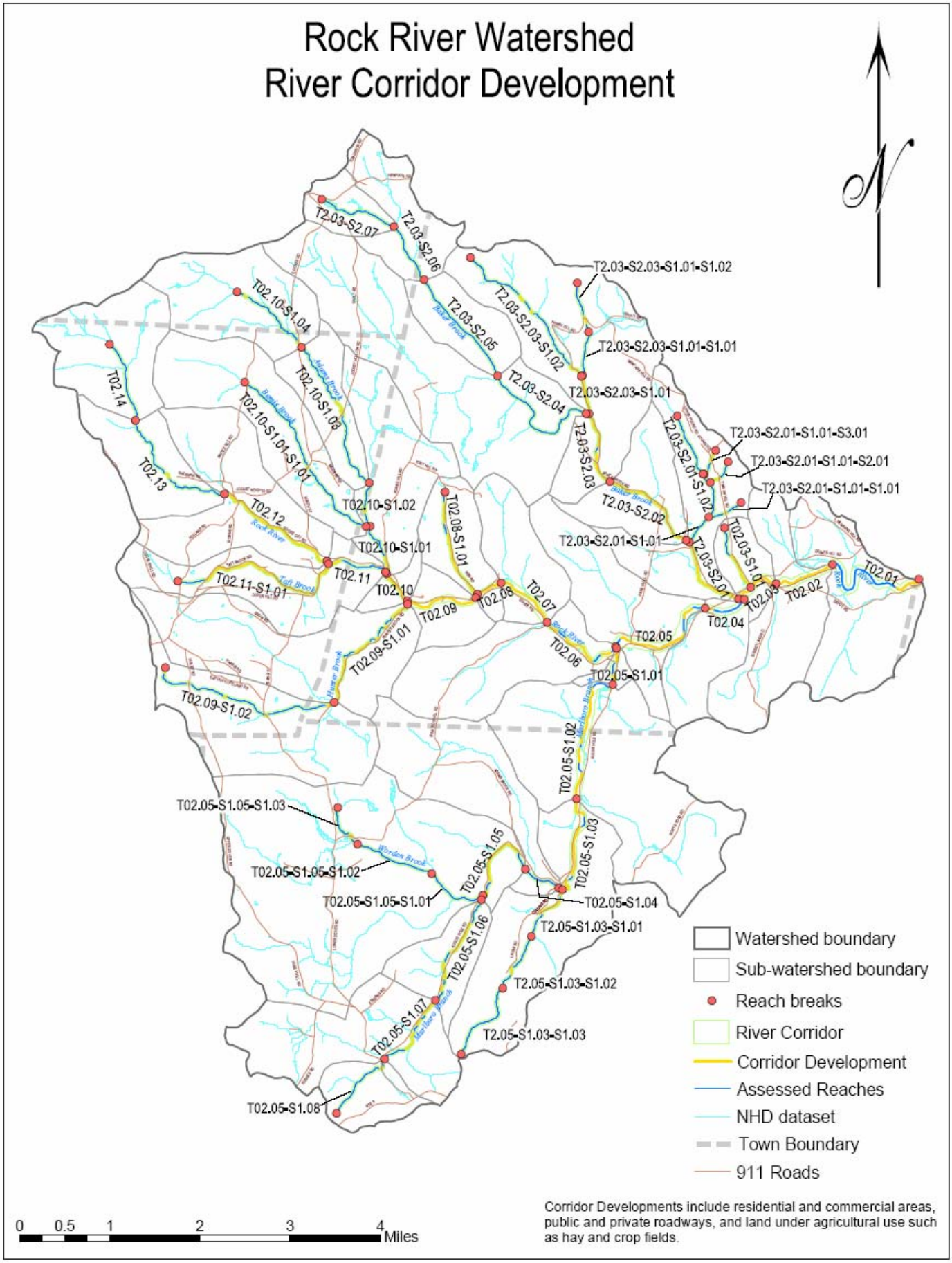

Figure 3.4.1: Map showing delineated Corridor Development areas (yellow).

3.5 Step 5. Instream Channel Modification

Instream channel modification has occurred throughout the state of Vermont over the years. Historically, dams and mills were built in and along streams; in addition towns mined the stream beds for gravel deposits and shored up banks to stabilize eroding areas. The VTANR Phase 1 Protocol Handbook recommends keeping the following assumptions in mind when evaluating instream channel modifications.

- Although rivers are dynamic, changing their channel form (or geometry) continually through erosion and depositional processes, they have a central tendency of form and process that has a predictable relationship with surrounding watershed land forms and which may undergo significant change naturally with climate changes over time; and

- Human-related physical change to river channels, floodplains, and watersheds often mimic and/or change the rate of natural physical processes in the watershed.

Parameters that are assessed in step 5, such as flow regulations, the presence of bridges and culverts, bank armoring, channel straightening and dredging are used in predicting the condition, current adjustment process and sensitivity of the reaches assessed.

Bank armoring, channel straightening and bridge and culvert impacts were evaluated using 1998 Vermont orthophotos and field checked during the windshield survey conducted in step seven. Using the ArcView Extension Reach Indexing Tool (RIT) lengths of stream where these impacts were observed were digitized and uploaded into the VTDEC online DMS. Please refer to the printed reports in Appendix A for further details on the locations and types of these impacts.

Dredging history was evaluated utilizing information based on local knowledge, town resources, and records from the VTDEC Stream Alteration Engineer office. Dredging and rechannelization has occurred along the Rock River main stem in response to flooding incidents during the 1970's in the Goose City area. One dredging violation occurred along the main stem just upstream of the Williamsville village during the 1990's. A wooden dam in the town of Williamsville has been dismantled naturally after being declared unnecessary in the 1980's. Other historic dredging and mining practices may have occurred along the Rock River and its larger tributaries, but no physical records of these practices were found.

3.6 Step 6. Floodplain Modification and Planform Changes

Many of the changes within the streambed can be attributed to modifications made in the floodplain area. The creation of roads and protective berms and development within the river corridor has an effect on the behaviors of the stream. These floodplain modifications have resulted in constriction of the stream by limiting the area in which the river can move laterally, and, indirectly, vertically. Very few stream reaches in the semi-confined and unconfined valleys in the Rock River watershed have free access to their floodplains. Restricting access to the floodplain will eventually force the stream into a higher slope gradient, and potentially increase the stream's energy enabling it to move larger material

in higher quantities than before the restrictions were in place. This could result in a downward cutting into the streambed, or degrading (incising) resulting in channel "evolution" or adjustment process. A more channelized stream carrying more sediment will also exhibit different deposition features within the stream bed. The increased amount of sediment will result in larger point bars and the creation of mid channel bars.

There are few mid channel bars present in the Rock River watershed, but the majority of the reaches were affected by floodplain modifications. The presence of roads and residential areas not only limits the streams' ability to maintain a state of equilibrium, but also contributes to the increase in sediment by creating areas of focused storm runoff. Compacted surfaces don't allow water to be absorbed and thus increase the velocity of the runoff waters. This results in larger amounts of surface water entering the streams and increases the flow and velocity of the stream. This in turn increases the potential for erosion hazards through the loose surficial geology and erosion prone soils.

3.7 Step 7. Bed and Bank Windshield Survey

The seventh step was a ground truthing parameter known as a windshield survey. Each reach that is accessible by car is surveyed and adjustments to elements of the previous parameters are made. In this way it is possible to confirm stream bed forms, account for any bedrock grade controls, culverts, or deposition features that were not visible in the orthophotos due to vegetative cover or resulting from more recent stream adjustments.

4.0 Discussion

The Rock River, like most rivers in Vermont, is undergoing adjustment processes as the land use and land cover around it changes. Historic deforestation, agriculture, dams and mills have all exacerbated the stream's natural adjustment process. Increased residential development, roads, and runoff augment the erosion hazards that are occurring around the watershed. This contributes to an increase in the sediment load of the streams, as the unstable glacial till is eroded from valley walls and stream banks. The primary goals of the Phase 1 Stream Geomorphic Assessment were to assess areas of significant erosion, especially those affecting public roads and access ways, and to identify significant stressors within the sub-watersheds having a negative impact on the stream systems. The areas with significant impact scores calculated from the Phase 1 assessment and areas of continuing concern where lower impact scores were found, but erosion hazards are known to exist, are identified and recommended for Phase 2 assessment.

5.0 Recommendations

Based on the parameters evaluated in the assessment, a final impact score was calculated for each reach. Scores were divided into Low, Medium and High priorities. Some reaches with medium priority scores were considered to be areas of concern and had exhibited erosion problems in the past. Based on this score, and on public knowledge of previous erosion problems, twenty-seven reaches were selected to be recommended for assessment in Phase 2. Please refer to Table 5.1 for a summary of recommended reaches, their impacts scores, and their condition in reference to the other reaches in the assessment. Refer to Figures 5.1 and 5.2 for a map reference.

Table 5.1: Summary of Reach Impacts, Priority Ranking and Condition

Reach description	Impact Score	Priority Ranking			Reach Condition			
		Low 1-7	Med 8-15	High 16-22	Reference	Good	Fair	Poor
Rock River								
T02.01: Mouth of the Rock River	12	Medium			Fair			
T02.02: Rock River main stem, below Williamsville village	18	High			Fair			
T02.03: Rock River main stem, through Williamsville village	17	High			Fair			
T02.04: Rock River main stem, upstream of Baker Brook	8	Low			Good			
T02.05: Rock River main stem, to South Newfane, Marlboro Branch	21	High			Fair			
T02.06: Rock River main stem, upstream of Marlboro Branch	12	Medium			Fair			
T02.07: Rock River main stem, along Dover Rd	14	Medium			Fair			

Reach description	Impact Score	Priority Ranking			Reach Condition		
		Low 1-7	Med 8-15	High 16-22	Reference	Good	Fair
Rock River							
T02.08: Rock River main stem, along Dover Rd	12	Medium			Fair		
T02.09: Rock River main stem, below Brookside	22	High			Poor		
T02.10: Rock River main stem through Brookside	16	High			Fair		
T02.11: Rock River main stem, between Brookside and East Dover	12	Medium			Fair		
T02.12: Rock River main stem, through Goose City	16	High			Fair		
T02.13: Rock River main stem, above Goose City, into Green Mountain National Forest	2	Low			Reference		
Baker Brook							
T2.03-S2.01: Mouth of Baker Brook	15	Medium			Fair		
T2.03-S2.02: Baker Brook, along Baker Brook Rd near Parish Hill Rd	16	High			Good		
T2.03-S2.03: Baker Brook main stem, along Baker Brook Rd	11	Medium			Good		

Reach description	Impact Score	Priority Ranking			Reach Condition			
		Low 1-7	Med 8-15	High 16-22	Reference	Good	Fair	Poor
Marlboro Branch								
T02.05-S1.01: Mouth of the Marlboro Branch	11	Medium			Fair			
T02.05-S1.02: Marlboro Branch main stem, paved Auger Hole Rd	17	High			Fair			
T02.05-S1.03: Marlboro Branch main stem, dirt Auger Hole Rd	21	High			Fair			
T02.05-S1.03-S1.01: Marlboro Branch tributary, Collins Rd	10	Medium			Good			
T02.05-S1.04: Marlboro Branch main stem, above Collins Rd	8	Low			Good			
T02.05-S1.05: Marlboro Branch main stem, along Auger Hole Rd	11	Medium			Good			
T02.05-S1.06: Marlboro Branch upstream of Worden Brook	13	Medium			Fair			
Tributaries								
T2.03-S2.03-S1.01: Baker Brook tributary along Baker Brook Rd	14	Medium			Good			
T02.08-S1.01: Brown Brook along New Rd	12	Medium			Fair			
T02.09-S1.01: Hunter Brook downstream of Brookside	14	Medium			Fair			
T02.11-S1.01: Taft Brook along Taft Brook Rd	15	Medium			Fair			

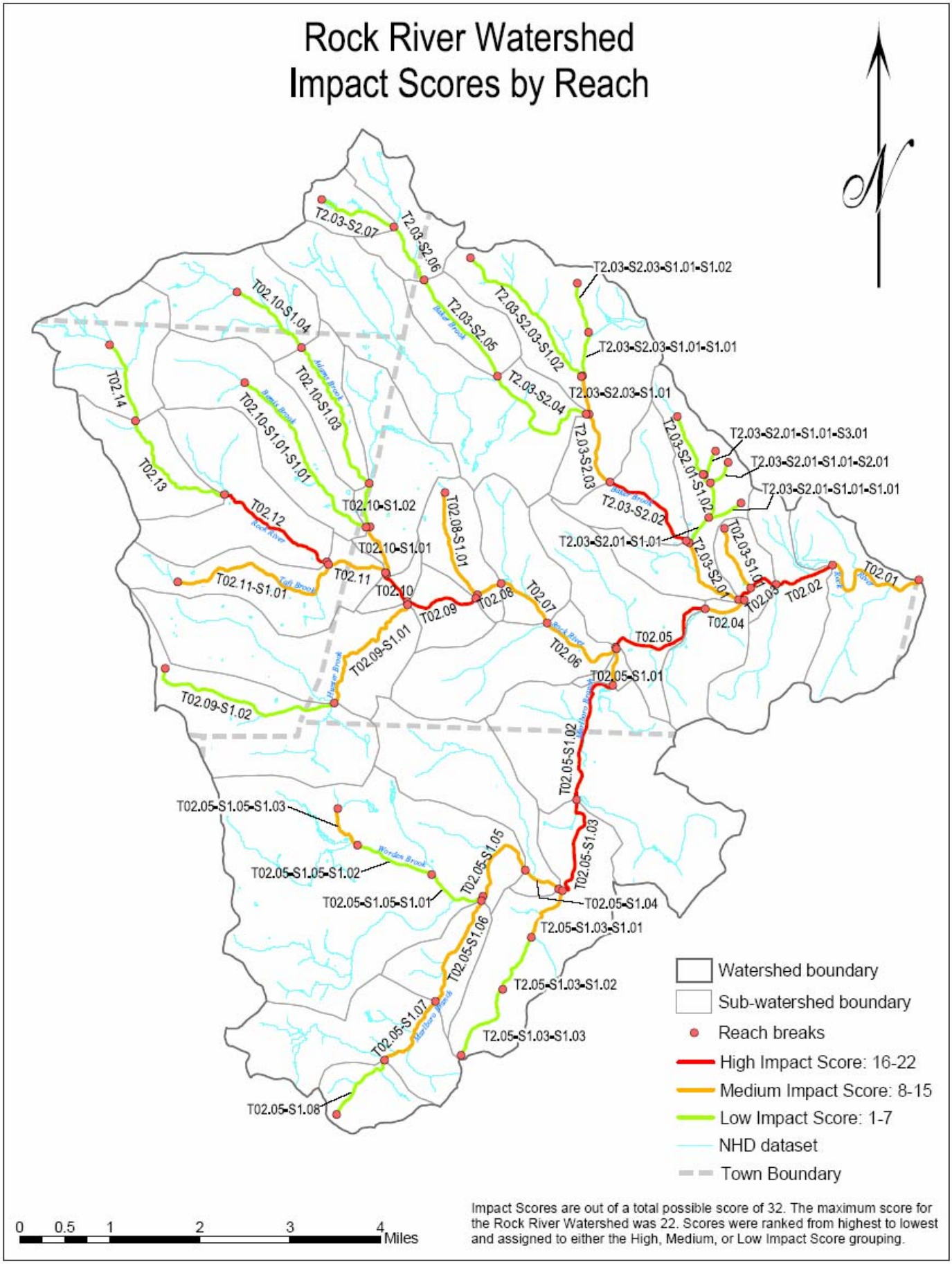

Figure 5.1: Map showing Priority ranking of reaches based on Impact Scores.

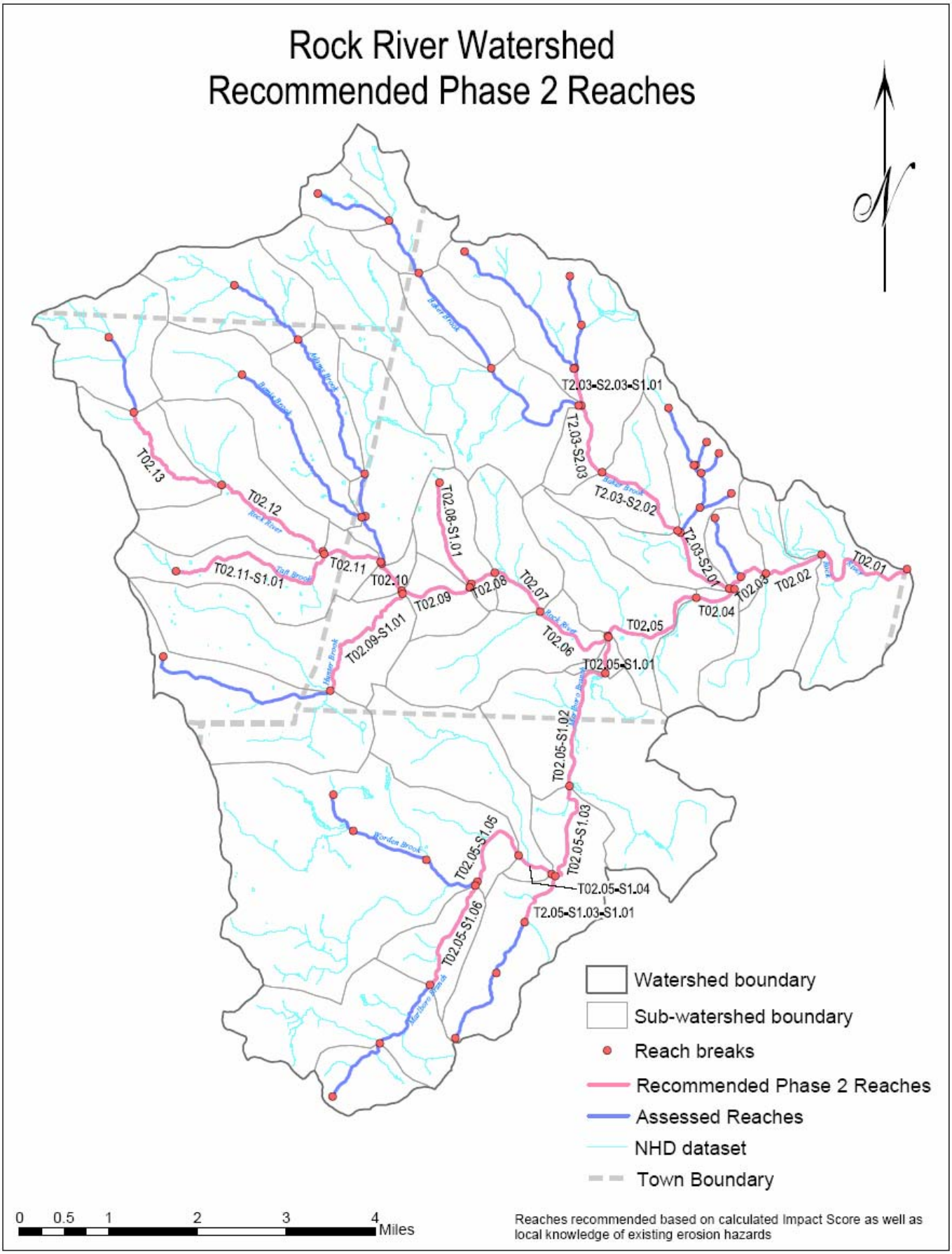

Figure 5.2: Map showing Recommended reaches for Stream Geomorphic Phase 2 Assessment.

References:

Hewlett, J.D. Principles of Forest Hydrology. Athens, Georgia: University of Georgia Press, 1982.

Thomas W. Torti, Vermont Agency of Natural Resources, December 9 2005. Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers

USDA, Soil Conservation Service, 1987. Soil Survey of Windham County Vermont, National Cooperative Survey, Vermont Agency of Environmental Conservation

Vermont Agency of Natural Resources, Department of Environmental Conservation, March 2006. Vermont Stream Geomorphic Assessment Phase 1 Handbook: Watershed Assessment Using Maps, Existing Data, and Windshield Surveys

Glossary of Terms:

Adapted from the ANR Vermont Stream Geomorphic Assessment Phase 1 Protocol Handbook, April 2004

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

Alluvium – A general term for detrital deposits made by streams on riverbeds.

Bank Armoring – The installation of concrete walls, stone riprap, and other large erosion resistant material along stream banks.

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

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.

Bed Form – The structure of the stream bed.

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.

Bridge and Culvert Impacts – The length of stream or river that exhibits changes in form as a result of the presence of a bridge or culvert. Such as: the presence of a pool below the structure, excessive deposition of material above the structure, constriction of the stream within the structure.

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

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.

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.

Degradation or Incision – Down-cutting of the streambed by the erosion of bed material. Degradation is an indicator that the stream's discharge and/or sediment load is changing.

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

Floodplain – Land built of sediment that is regularly covered with water as a result of the flooding of a nearby stream. The function of a floodplain is to effect 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).

Flood Chute – A channel carved out and accessed by a stream during flood conditions often cutting across a portion meander bend.

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

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.

Glaciofluvial – A depositional process involving the meltwater from glacier ice.

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

High gradient streams – Typically found in steep, narrow valleys, these streams have steep slopes and are usually fast moving with many riffles or steps and low sinuosity.

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.

Instream Channel Modification – Changes made to the stream bed such as dredging or gravel mining of channel bars.

Loam – Soil composed of a relatively even mixture of three mineral particle size groups: sand, silt, and clay. Loams are gritty, plastic when moist, and retain water easily. Yet they drain well where the topography allows. They generally contain more nutrients than sandy soils. In addition to the term *loam*, different names are given to soils with slightly different proportions of sand, silt, and clay: sandy loam, silty loam, clay loam, sandy clay loam, silty clay loam.

Low gradient streams – Typically found in wide valleys, these streams have shallow slopes and are usually slow and meandering.

Meander – A bend in a stream, or referring to the way a stream winds down its valley.

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.

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

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

Reference Stream Type – Describes stream channel forms and processes that would exist in the absence of human-related changes to the channel, floodplain, and/or watershed. Defined for each reach by evaluating reach valley slope and confinement, then refined using bed form and channel substrate data.

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.

Remote Sensing Techniques – The gathering of data from various sources including: data collected from maps, aerial photographs, and orthophotos.
Existing Data, which includes, but is not limited to, studies such as NRCS soil surveys, and may also include first-hand knowledge from resource specialists.

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

Riparian 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.

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).

Sediment Loads – Sediment load is divided into three categories: Suspended Load contains organic and inorganic particulate matter that is suspended in and carried by moving water. Dissolved Load is all organic and inorganic material carried in solution by moving water. Bed load is coarse materials such as gravel, stones, and boulders that move along the bottom of the channel. These materials move by skipping, rolling, and sliding. (Hewlett, 1982)

Sediment -- Soil or mineral material transported by water or wind and deposited in streams or other bodies of water. A sediment load is the amount of material the stream is transporting

Sinuosity – The level of bends or turns in a stream, calculated by dividing the stream length by the valley length.

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

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

Stream/River Corridor – A minimum width of land within the overall valley width that may be occupied by the active stream channel.

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.

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

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

Windshield Survey – General observations made from a car as you drive about the watershed.

Windthrow – Trees uprooted by wind, or the phenomenon that causes such uprooting to occur.

Appendix A

Parameter Data Reports

Reach-by-Reach Summary Reports

Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.13**

Stream Name: **Rock River Main Stem**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, above Goose City, into Green Mountain National Forest

1.2 Towns: **Dover**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.79**

Step 2. Stream Type

2.1 Elevation Upstream: **1771**

2.1 Elevation Downstream: **1279**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(8200) (1.55)**

2.3 Valley Slope (%): **6.00**

2.4 Channel Length (ft.)(mi.): **(8210) (1.55)**

2.5 Channel Slope (%): **5.99**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.54**

2.8 Channel Width (ft.): **19.7**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (77.8)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **C (51.0)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **2.5 (42.9)**

3.5 Soils - Water Table Shallow (%): **1.5 (42.9)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (87.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Crop**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (57.6)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **1.3**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**1 Low**	**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.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**2**

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West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.12**

Stream Name: **Rock River Main Stem**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, through Goose City

1.2 Towns: **Dover**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.77**

Step 2. Stream Type

2.1 Elevation Upstream: **1279**

2.1 Elevation Downstream: **1082**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(7811) (1.48)**

2.3 Valley Slope (%): **2.52**

2.4 Channel Length (ft.)(mi.): **(7821) (1.48)**

2.5 Channel Slope (%): **2.52**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **4.60**

2.8 Channel Width (ft.): **25.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Multiple**

3.3 Dominant Geologic Material (%): **Till (43.6)**

3.3 Sub-dominant Geologic Material: **Alluvial**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **C (42.5)**

3.5 Soils - Flooding (%): **None/Rare (60.7)**

3.5 Soils - Water Table Deep (%): **2.5 (35.0)**

3.5 Soils - Water Table Shallow (%): **1.5 (53.8)**

3.5 Soils - Erodibility (%): **Severe (60.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.6)**

4.1 Current Watershed Sub-Dominant Land Cover: **Crop**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (38.6)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.7 (1)**

5.3 Bank Armoring %: **1.3**

5.4 Channel Straightening %: **None**

5.5 Dredging History **Dredging**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **48.3**

6.2 Floodplain Development %: **29.5**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Bend**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**2 High**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**2 High**	**2 High**	**2 High**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**2 High**	**1 Low**	**16**

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West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.11-S1.01**

Stream Name: **Taft Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Taft Brook along Taft Brook Rd to Holland Rd

1.2 Towns: **Dover**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.77**

Step 2. Stream Type

2.1 Elevation Upstream: **1754**

2.1 Elevation Downstream: **1082**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(11348) (2.15)**

2.3 Valley Slope (%): **5.92**

2.4 Channel Length (ft.)(mi.): **(11358) (2.15)**

2.5 Channel Slope (%): **5.92**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.30**

2.8 Channel Width (ft.): **14.7**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (79.4)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (61.9)**

3.5 Soils - Flooding (%): **None/Rare (89.4)**

3.5 Soils - Water Table Deep (%): **6.0 (54.1)**

3.5 Soils - Water Table Shallow (%): **6.0 (54.1)**

3.5 Soils - Erodibility (%): **Very Severe (82.9)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (70.5)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (44.7)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.3 (5)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **17.0**

5.5 Dredging History **Gravel Mining**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **66.3**

6.2 Floodplain Development %: **26.1**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**1 Low**	**1 Low**	**2 High**	**2 High**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**2 High**	**15**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.11**

Stream Name: **Rock River Main Stem**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, between Brookside and East Dover

1.2 Towns: **Dover, Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1082**

2.1 Elevation Downstream: **967**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3863) (0.73)**

2.3 Valley Slope (%): **2.98**

2.4 Channel Length (ft.)(mi.): **(3873) (0.73)**

2.5 Channel Slope (%): **2.97**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **6.22**

2.8 Channel Width (ft.): **29.3**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (62.5)**

3.3 Sub-dominant Geologic Material: **Alluvial**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **C (90.0)**

3.5 Soils - Flooding (%): **None/Rare (68.4)**

3.5 Soils - Water Table Deep (%): **1.5 (53.4)**

3.5 Soils - Water Table Shallow (%): **1.5 (36.6)**

3.5 Soils - Erodibility (%): **Severe (68.4)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (78.7)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (41.6)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **51-100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.1 (1)**

5.3 Bank Armoring %: **2.2**

5.4 Channel Straightening %: **11.6**

5.5 Dredging History **Gravel Mining**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **6.9**

6.3 Channel Bars: **Delta**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **High**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**1 Low**	**2 High**	**0 N.S.**	**1 Low**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**2 High**	**0 N.S.**	**12**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.10-S1.04**

Stream Name: **Adams Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Adams Brook, from East Dover Road to headwaters

1.2 Towns: **Dover, Wardsboro**

1.3 Downstream Latitude: **42.98**

1.3 Downstream Longitude: **-72.78**

Step 2. Stream Type

2.1 Elevation Upstream: **1836**

2.1 Elevation Downstream: **1574**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5452) (1.03)**

2.3 Valley Slope (%): **4.81**

2.4 Channel Length (ft.)(mi.): **(5462) (1.03)**

2.5 Channel Slope (%): **4.80**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.61**

2.8 Channel Width (ft.): **16.1**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (76.2)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (80.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (71.3)**

3.5 Soils - Water Table Shallow (%): **6.0 (71.3)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (83.0)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (50.7)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.2 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **2.3**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**4**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.10-S1.03**

Stream Name: **Adams Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Adams Brook, up to East Dover Road

1.2 Towns: **Dover**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1574**

2.1 Elevation Downstream: **1197**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(9944) (1.88)**

2.3 Valley Slope (%): **3.79**

2.4 Channel Length (ft.)(mi.): **(9954) (1.89)**

2.5 Channel Slope (%): **3.79**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.46**

2.8 Channel Width (ft.): **19.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Ice-Contact (53.8)**

3.3 Sub-dominant Geologic Material: **Other**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (39.0)**

3.5 Soils - Flooding (%): **None/Rare (69.2)**

3.5 Soils - Water Table Deep (%): **6.0 (49.3)**

3.5 Soils - Water Table Shallow (%): **6.0 (49.3)**

3.5 Soils - Erodibility (%): **Severe (69.2)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (81.6)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (46.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.4 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **3.1**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**5**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.10-S1.02**

Stream Name: **Adams Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Adams Brook, through narrow valley

1.2 Towns: **Dover, Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1197**

2.1 Elevation Downstream: **1082**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2719) (0.51)**

2.3 Valley Slope (%): **4.23**

2.4 Channel Length (ft.)(mi.): **(2729) (0.52)**

2.5 Channel Slope (%): **4.21**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **3.65**

2.8 Channel Width (ft.): **23.1**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Ice-Contact (52.2)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (52.2)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (97.9)**

3.5 Soils - Water Table Shallow (%): **6.0 (97.9)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.5)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (29.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.5 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **2.4**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**5**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.10-S1.01-S1.01**

Stream Name: **Bemis Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Bemis Brook, majority of reach is fairly remote, few road crossings. South west side of Whites Hill

1.2 Towns: **Dover, Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1640**

2.1 Elevation Downstream: **1246**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(11980) (2.27)**

2.3 Valley Slope (%): **3.29**

2.4 Channel Length (ft.)(mi.): **(11990) (2.27)**

2.5 Channel Slope (%): **3.29**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.03**

2.8 Channel Width (ft.): **17.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (55.5)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **C (51.4)**

3.5 Soils - Flooding (%): **None/Rare (94.2)**

3.5 Soils - Water Table Deep (%): **2.5 (43.4)**

3.5 Soils - Water Table Shallow (%): **1.5 (49.1)**

3.5 Soils - Erodibility (%): **Very Severe (94.2)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.7)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (61.8)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.7 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.8**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**4**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.10-S1.01**

Stream Name: **Adams Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Adams Brook, runs along Adams Brook Road

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1082**

2.1 Elevation Downstream: **918**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3237) (0.61)**

2.3 Valley Slope (%): **5.07**

2.4 Channel Length (ft.)(mi.): **(3247) (0.61)**

2.5 Channel Slope (%): **5.05**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **6.12**

2.8 Channel Width (ft.): **29.1**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (92.4)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (84.8)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (92.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (92.5)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.3)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (26.8)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **51-100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.2 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **30.8**

6.2 Floodplain Development %: **9.2**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**9**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.10**

Stream Name: **Rock River Main Stem**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem through Brookside

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.75**

Step 2. Stream Type

2.1 Elevation Upstream: **967**

2.1 Elevation Downstream: **885**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2235) (0.42)**

2.3 Valley Slope (%): **3.67**

2.4 Channel Length (ft.)(mi.): **(2245) (0.43)**

2.5 Channel Slope (%): **3.65**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **12.57**

2.8 Channel Width (ft.): **39.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Ice-Contact (74.1)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (74.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (79.5)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Shrub**

4.2 Current Corridor Dominant Land Cover: **Urban (59.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **3.0 (1)**

5.3 Bank Armoring %: **68.6**

5.4 Channel Straightening %: **42.0**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **76.0**

6.2 Floodplain Development %: **23.2**

6.3 Channel Bars: **Mid-channel**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**2 High**	**2 High**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**0 N.S.**	**16**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.09-S1.02**

Stream Name: **Hunter Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Headwaters of Hunter Brook

1.2 Towns: **Dover, Newfane**

1.3 Downstream Latitude: **42.93**

1.3 Downstream Longitude: **-72.77**

Step 2. Stream Type

2.1 Elevation Upstream: **2197**

2.1 Elevation Downstream: **984**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(11745) (2.22)**

2.3 Valley Slope (%): **10.33**

2.4 Channel Length (ft.)(mi.): **(11755) (2.23)**

2.5 Channel Slope (%): **10.32**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.24**

2.8 Channel Width (ft.): **18.7**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Dam**

3.3 Dominant Geologic Material (%): **Till (99.3)**

3.3 Sub-dominant Geologic Material: **Other**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **C (54.0)**

3.5 Soils - Flooding (%): **None/Rare (99.3)**

3.5 Soils - Water Table Deep (%): **2.5 (49.9)**

3.5 Soils - Water Table Shallow (%): **1.5 (49.9)**

3.5 Soils - Erodibility (%): **Very Severe (99.3)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.1)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (59.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.5 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **3.3**

6.2 Floodplain Development %: **2.7**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Culvert**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**7**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.09-S1.01**

Stream Name: **Hunter Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Hunter Brook, located along Hunter Brook Road. Steep valley wall on right bank

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.75**

Step 2. Stream Type

2.1 Elevation Upstream: **984**

2.1 Elevation Downstream: **885**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(8593) (1.63)**

2.3 Valley Slope (%): **1.15**

2.4 Channel Length (ft.)(mi.): **(8603) (1.63)**

2.5 Channel Slope (%): **1.15**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **4.72**

2.8 Channel Width (ft.): **25.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (89.8)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Extremely Steep**

3.5 Soils - Hydrologic Group (%): **B (54.6)**

3.5 Soils - Flooding (%): **None/Rare (98.2)**

3.5 Soils - Water Table Deep (%): **6.0 (63.1)**

3.5 Soils - Water Table Shallow (%): **6.0 (63.1)**

3.5 Soils - Erodibility (%): **Very Severe (98.2)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (81.9)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (33.9)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **0-25**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **2.1 (5)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **50.6**

6.2 Floodplain Development %: **18.6**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **36 (1.4)**

6.6 Wavelength (Ratio): **142 (5.5)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **High**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**1 Low**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**2 High**	**2 High**	**18**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.09**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE, WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, below Brookside

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.74**

Step 2. Stream Type

2.1 Elevation Upstream: **885**

2.1 Elevation Downstream: **852**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4244) (0.80)**

2.3 Valley Slope (%): **0.78**

2.4 Channel Length (ft.)(mi.): **(4506) (0.85)**

2.5 Channel Slope (%): **0.73**

2.6 Sinuosity: **1.06**

2.7 Watershed Area (sq. mi.): **17.85**

2.8 Channel Width (ft.): **46.6**

2.9 Valley Width (ft.): **382**

2.10 Confinement Ratio: **8.2**

2.10 Confinement Type: **Broad**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Ice-Contact (69.3)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **A (69.3)**

3.5 Soils - Flooding (%): **None/Rare (95.7)**

3.5 Soils - Water Table Deep (%): **6.0 (74.3)**

3.5 Soils - Water Table Shallow (%): **6.0 (74.3)**

3.5 Soils - Erodibility (%): **Very Severe (95.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.3)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (43.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **26-50**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **2.4 (2)**

5.3 Bank Armoring %: **68.0**

5.4 Channel Straightening %: **24.5**

5.5 Dredging History **Dredging**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **75.8**

6.2 Floodplain Development %: **29.2**

6.3 Channel Bars: **Point**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **43 (0.9)**

6.6 Wavelength (Ratio): **43 (0.9)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Bridge**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**2 High**	**2 High**	**1 Low**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**2 High**	**1 Low**	**22**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.08-S1.01**

Stream Name: **Brown Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Small tributary running along New Road

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.74**

Step 2. Stream Type

2.1 Elevation Upstream: **1574**

2.1 Elevation Downstream: **852**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(6731) (1.27)**

2.3 Valley Slope (%): **10.73**

2.4 Channel Length (ft.)(mi.): **(6741) (1.28)**

2.5 Channel Slope (%): **10.71**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.66**

2.8 Channel Width (ft.): **10.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Extremely Steep**

3.4 Right Valley Side Slope: **Extremely Steep**

3.5 Soils - Hydrologic Group (%): **C (75.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **2.5 (74.3)**

3.5 Soils - Water Table Shallow (%): **1.5 (74.3)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (78.3)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (50.8)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **26-50**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **2.1 (5)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **79.6**

6.2 Floodplain Development %: **23.6**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **High**

7.3 Ice/Debris Jam Potential: **Culvert**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**2 High**	**1 Low**	**12**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.08**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, along Dover Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.73**

Step 2. Stream Type

2.1 Elevation Upstream: **852**

2.1 Elevation Downstream: **787**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(1771) (0.34)**

2.3 Valley Slope (%): **3.67**

2.4 Channel Length (ft.)(mi.): **(1781) (0.34)**

2.5 Channel Slope (%): **3.65**

2.6 Sinuosity: **1.01**

2.7 Watershed Area (sq. mi.): **18.68**

2.8 Channel Width (ft.): **47.5**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Alluvial (60.1)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **B (87.8)**

3.5 Soils - Flooding (%): **Frequent (60.1)**

3.5 Soils - Water Table Deep (%): **3.0 (60.1)**

3.5 Soils - Water Table Shallow (%): **1.5 (60.1)**

3.5 Soils - Erodibility (%): **Moderate (39.9)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (56.8)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **51-100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **63.1**

6.2 Floodplain Development %: **29.4**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **c**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**2 High**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**2 High**	**0 N.S.**	**12**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.07**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, along Dover Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.72**

Step 2. Stream Type

2.1 Elevation Upstream: **787**

2.1 Elevation Downstream: **721**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3792) (0.72)**

2.3 Valley Slope (%): **1.74**

2.4 Channel Length (ft.)(mi.): **(3802) (0.72)**

2.5 Channel Slope (%): **1.74**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **19.70**

2.8 Channel Width (ft.): **48.6**

2.9 Valley Width (ft.): **496**

2.10 Confinement Ratio: **10.2**

2.10 Confinement Type: **Very Broad**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Alluvial (70.6)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **B (70.9)**

3.5 Soils - Flooding (%): **Frequent (70.6)**

3.5 Soils - Water Table Deep (%): **6.0 (89.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (89.5)**

3.5 Soils - Erodibility (%): **Moderate (29.4)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.3)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Shrub**

4.2 Current Corridor Dominant Land Cover: **Urban (31.9)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **51-100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **15.0**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **62.0**

6.2 Floodplain Development %: **29.7**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **36 (0.7)**

6.6 Wavelength (Ratio): **330 (6.8)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**2 High**	**0 N.S.**	**2 High**	**1 Low**	**2 High**	**0 N.S.**	**17**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.06**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, upstream of Marlboro Branch and South Newfane Village

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **721**

2.1 Elevation Downstream: **606**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5349) (1.01)**

2.3 Valley Slope (%): **2.15**

2.4 Channel Length (ft.)(mi.): **(5359) (1.01)**

2.5 Channel Slope (%): **2.15**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **21.42**

2.8 Channel Width (ft.): **50.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **Yes**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Alluvial (61.4)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **B (89.8)**

3.5 Soils - Flooding (%): **Frequent (61.4)**

3.5 Soils - Water Table Deep (%): **6.0 (86.2)**

3.5 Soils - Water Table Shallow (%): **6.0 (86.2)**

3.5 Soils - Erodibility (%): **Moderate (38.6)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (80.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Residential**

4.2 Current Corridor Dominant Land Cover: **Forest (30.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **51-100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **9.1**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **13.1**

6.2 Floodplain Development %: **20.0**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **Migration**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**1 Low**	**2 High**	**1 Low**	**1 Low**	**0 Unk.**	**0 Unk.**	**2 High**	**0 N.S.**	**12**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.08**

Stream Name: **Marlboro Branch**

Topo Maps: **JACKSONVILLE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Headwaters of Marlboro Branch ending at Rt 9

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.87**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1853**

2.1 Elevation Downstream: **1394**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4685) (0.89)**

2.3 Valley Slope (%): **9.80**

2.4 Channel Length (ft.)(mi.): **(4695) (0.89)**

2.5 Channel Slope (%): **9.78**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.65**

2.8 Channel Width (ft.): **10.8**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (66.8)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **C (68.6)**

3.5 Soils - Flooding (%): **None/Rare (93.2)**

3.5 Soils - Water Table Deep (%): **1.5 (59.2)**

3.5 Soils - Water Table Shallow (%): **1.0 (52.3)**

3.5 Soils - Erodibility (%): **Very Severe (93.2)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (78.7)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (61.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.6 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **1.0**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**4**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.07**

Stream Name: **Marlboro Branch**

Topo Maps: **JACKSONVILLE, NEWFANE, WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch along dirt Auger Hole Rd

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.88**

1.3 Downstream Longitude: **-72.75**

Step 2. Stream Type

2.1 Elevation Upstream: **1394**

2.1 Elevation Downstream: **1246**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5107) (0.97)**

2.3 Valley Slope (%): **2.90**

2.4 Channel Length (ft.)(mi.): **(5117) (0.97)**

2.5 Channel Slope (%): **2.89**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.70**

2.8 Channel Width (ft.): **20.3**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Ice-Contact (83.1)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (83.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Severe (57.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (78.3)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (40.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **19.6**

6.2 Floodplain Development %: **15.2**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**1 Low**	**1 Low**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**0 N.S.**	**9**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.06**

Stream Name: **Marlboro Branch**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch upstream of Worden Brook

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.74**

Step 2. Stream Type

2.1 Elevation Upstream: **1246**

2.1 Elevation Downstream: **1049**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(7107) (1.35)**

2.3 Valley Slope (%): **2.77**

2.4 Channel Length (ft.)(mi.): **(7117) (1.35)**

2.5 Channel Slope (%): **2.77**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **3.48**

2.8 Channel Width (ft.): **22.7**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Ice-Contact (66.9)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **A (66.9)**

3.5 Soils - Flooding (%): **None/Rare (98.6)**

3.5 Soils - Water Table Deep (%): **6.0 (95.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (95.5)**

3.5 Soils - Erodibility (%): **Very Severe (98.6)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (79.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (32.5)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **26-50**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **2.3 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **24.2**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **33.0**

6.2 Floodplain Development %: **15.5**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Bridge**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**2 High**	**0 N.S.**	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**13**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.05-S1.03**

Stream Name: **Worden Brook**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: headwaters of Worden Brook, wetlands area

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1525**

2.1 Elevation Downstream: **1476**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2894) (0.55)**

2.3 Valley Slope (%): **1.69**

2.4 Channel Length (ft.)(mi.): **(2904) (0.55)**

2.5 Channel Slope (%): **1.69**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.25**

2.8 Channel Width (ft.): **18.7**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Dune-Ripple**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Dam**

3.3 Dominant Geologic Material (%): **Till (61.8)**

3.3 Sub-dominant Geologic Material: **Other**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **D (45.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (59.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (59.0)**

3.5 Soils - Erodibility (%): **Severe (64.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (85.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Wetland**

4.2 Current Corridor Dominant Land Cover: **Forest (45.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **51-100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **Impoundment**

5.2 Bridges and Culverts % (Number): **1.3 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **3.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **Migration**

6.5 Meander Width (Ratio): **8 (0.4)**

6.6 Wavelength (Ratio): **38 (2.0)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Dune-Ripple**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**2 High**	**0 N.S.**	**1 Low**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**1 Low**	**2 High**	**2 High**	**0 N.D.**	**0 N.D.**	**10**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.05-S1.02**

Stream Name: **Worden Brook**

Topo Maps: **NEWFANE, WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Worden Brook through narrow valley

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.75**

Step 2. Stream Type

2.1 Elevation Upstream: **1476**

2.1 Elevation Downstream: **1279**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4785) (0.91)**

2.3 Valley Slope (%): **4.12**

2.4 Channel Length (ft.)(mi.): **(4795) (0.91)**

2.5 Channel Slope (%): **4.11**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.75**

2.8 Channel Width (ft.): **20.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **C (59.3)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **2.5 (59.3)**

3.5 Soils - Water Table Shallow (%): **1.5 (59.3)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (86.0)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (56.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **---**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **No Data**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Low	**N.D.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.D.**	**N.D.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.05-S1.01**

Stream Name: **Worden Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Mouth of Worden Brook through narrow valley

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.74**

Step 2. Stream Type

2.1 Elevation Upstream: **1279**

2.1 Elevation Downstream: **1049**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3876) (0.73)**

2.3 Valley Slope (%): **5.93**

2.4 Channel Length (ft.)(mi.): **(3886) (0.74)**

2.5 Channel Slope (%): **5.92**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **5.28**

2.8 Channel Width (ft.): **27.3**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (72.6)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Extremely Steep**

3.4 Right Valley Side Slope: **Extremely Steep**

3.5 Soils - Hydrologic Group (%): **C (43.0)**

3.5 Soils - Flooding (%): **None/Rare (87.7)**

3.5 Soils - Water Table Deep (%): **6.0 (44.7)**

3.5 Soils - Water Table Shallow (%): **1.5 (55.3)**

3.5 Soils - Erodibility (%): **Very Severe (87.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (84.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (58.3)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**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.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**3**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.05**

Stream Name: **Marlboro Branch**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch main stem, along Auger Hole Rd

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.73**

Step 2. Stream Type

2.1 Elevation Upstream: **1049**

2.1 Elevation Downstream: **885**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5866) (1.11)**

2.3 Valley Slope (%): **2.80**

2.4 Channel Length (ft.)(mi.): **(5876) (1.11)**

2.5 Channel Slope (%): **2.79**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **9.62**

2.8 Channel Width (ft.): **35.5**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (49.7)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **C (48.5)**

3.5 Soils - Flooding (%): **None/Rare (78.6)**

3.5 Soils - Water Table Deep (%): **6.0 (41.0)**

3.5 Soils - Water Table Shallow (%): **1.5 (53.7)**

3.5 Soils - Erodibility (%): **Severe (70.5)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.9)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (39.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **69.7**

6.2 Floodplain Development %: **21.2**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**0 N.S.**	**11**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.04**

Stream Name: **Marlboro Branch**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch main stem, above Collins Rd

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.72**

Step 2. Stream Type

2.1 Elevation Upstream: **885**

2.1 Elevation Downstream: **852**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2362) (0.45)**

2.3 Valley Slope (%): **1.40**

2.4 Channel Length (ft.)(mi.): **(2372) (0.45)**

2.5 Channel Slope (%): **1.39**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **11.39**

2.8 Channel Width (ft.): **38.2**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Other (66.9)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **Not Rated (66.9)**

3.5 Soils - Flooding (%): **Occasional (66.9)**

3.5 Soils - Water Table Deep (%): **6.0 (21.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (21.5)**

3.5 Soils - Erodibility (%): **Slight (22.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (83.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (22.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **26-50**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.5 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **5.3**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **Mid-channel**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **20 (0.5)**

6.6 Wavelength (Ratio): **172 (4.5)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Bridge**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**12**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.05-S1.03-S1.03**

Stream Name: **Lahar Road Tributary**

Topo Maps: **GOVERNORS MOUNTAIN, NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Headwaters of tributary

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.88**

1.3 Downstream Longitude: **-72.73**

Step 2. Stream Type

2.1 Elevation Upstream: **1804**

2.1 Elevation Downstream: **1082**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5247) (0.99)**

2.3 Valley Slope (%): **13.76**

2.4 Channel Length (ft.)(mi.): **(5257) (1.00)**

2.5 Channel Slope (%): **13.73**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.53**

2.8 Channel Width (ft.): **9.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (64.9)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **C (53.3)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (86.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (55.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **---**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Low	**N.D.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.D.**	**N.S.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.05-S1.03-S1.02**

Stream Name: **Lahar Road Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch tributary running along Lahar Road

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.89**

1.3 Downstream Longitude: **-72.73**

Step 2. Stream Type

2.1 Elevation Upstream: **1082**

2.1 Elevation Downstream: **934**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3693) (0.70)**

2.3 Valley Slope (%): **4.01**

2.4 Channel Length (ft.)(mi.): **(3703) (0.70)**

2.5 Channel Slope (%): **4.00**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.96**

2.8 Channel Width (ft.): **12.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Ice-Contact (57.1)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **A (57.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (88.7)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (57.7)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **3.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **Bend**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**1 Low**	**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.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**4**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.05-S1.03-S1.01**

Stream Name: **Lahar Road Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch tributary, Collins Rd

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.90**

1.3 Downstream Longitude: **-72.72**

Step 2. Stream Type

2.1 Elevation Upstream: **934**

2.1 Elevation Downstream: **852**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3667) (0.69)**

2.3 Valley Slope (%): **2.24**

2.4 Channel Length (ft.)(mi.): **(3677) (0.70)**

2.5 Channel Slope (%): **2.23**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.76**

2.8 Channel Width (ft.): **16.8**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (90.9)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (96.4)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (94.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (94.5)**

3.5 Soils - Erodibility (%): **Very Severe (97.5)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (87.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (37.6)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **3.1 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **43.6**

6.2 Floodplain Development %: **14.0**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**2 High**	**10**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.03**

Stream Name: **Marlboro Branch**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch main stem, dirt Auger Hole Rd

1.2 Towns: **Marlboro**

1.3 Downstream Latitude: **42.91**

1.3 Downstream Longitude: **-72.72**

Step 2. Stream Type

2.1 Elevation Upstream: **852**

2.1 Elevation Downstream: **754**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(6007) (1.14)**

2.3 Valley Slope (%): **1.63**

2.4 Channel Length (ft.)(mi.): **(6788) (1.29)**

2.5 Channel Slope (%): **1.44**

2.6 Sinuosity: **1.13**

2.7 Watershed Area (sq. mi.): **13.92**

2.8 Channel Width (ft.): **41.7**

2.9 Valley Width (ft.): **455**

2.10 Confinement Ratio: **10.9**

2.10 Confinement Type: **Very Broad**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Alluvial (47.8)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Flat**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **B (65.4)**

3.5 Soils - Flooding (%): **None/Rare (52.2)**

3.5 Soils - Water Table Deep (%): **3.0 (47.8)**

3.5 Soils - Water Table Shallow (%): **1.5 (61.3)**

3.5 Soils - Erodibility (%): **Moderate (39.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (83.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Field**

4.2 Current Corridor Dominant Land Cover: **Urban (32.9)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **26-50**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **2.4 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **51.7**

5.5 Dredging History **Dredging**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **70.1**

6.2 Floodplain Development %: **24.1**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **38 (0.9)**

6.6 Wavelength (Ratio): **38 (0.9)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**2 High**	**1 Low**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**2 High**	**21**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.02**

Stream Name: **Marlboro Branch**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Marlboro Branch main stem, paved Auger Hole Rd

1.2 Towns: **Marlboro, Newfane**

1.3 Downstream Latitude: **42.93**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **754**

2.1 Elevation Downstream: **672**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(7126) (1.35)**

2.3 Valley Slope (%): **1.15**

2.4 Channel Length (ft.)(mi.): **(8326) (1.58)**

2.5 Channel Slope (%): **0.98**

2.6 Sinuosity: **1.17**

2.7 Watershed Area (sq. mi.): **17.56**

2.8 Channel Width (ft.): **46.2**

2.9 Valley Width (ft.): **896**

2.10 Confinement Ratio: **19.4**

2.10 Confinement Type: **Very Broad**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Alluvial (54.3)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Flat**

3.5 Soils - Hydrologic Group (%): **B (71.0)**

3.5 Soils - Flooding (%): **Frequent (54.3)**

3.5 Soils - Water Table Deep (%): **6.0 (51.4)**

3.5 Soils - Water Table Shallow (%): **6.0 (51.4)**

3.5 Soils - Erodibility (%): **Moderate (33.8)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (84.9)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Field**

4.2 Current Corridor Dominant Land Cover: **Forest (32.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **0-25**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **16.6**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **20.7**

6.2 Floodplain Development %: **22.0**

6.3 Channel Bars: **Mid-channel**

6.4 Meander Migration: **Migration**

6.5 Meander Width (Ratio): **41 (0.9)**

6.6 Wavelength (Ratio): **309 (6.7)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **Bend**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**1 Low**	**2 High**	**1 Low**	**1 Low**	**1 Low**	**17**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05-S1.01**

Stream Name: **Marlboro Branch**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Mouth of the Marlboro Branch

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **672**

2.1 Elevation Downstream: **639**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2258) (0.43)**

2.3 Valley Slope (%): **1.46**

2.4 Channel Length (ft.)(mi.): **(2268) (0.43)**

2.5 Channel Slope (%): **1.46**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **17.68**

2.8 Channel Width (ft.): **46.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (34.1)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Flat**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (66.3)**

3.5 Soils - Flooding (%): **None/Rare (67.8)**

3.5 Soils - Water Table Deep (%): **6.0 (77.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (77.0)**

3.5 Soils - Erodibility (%): **Severe (67.8)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (84.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (44.5)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **26-50**

4.3 Riparian Buffer - Right Bank: **51-100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **2.4 (1)**

5.3 Bank Armoring %: **4.2**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **46.3**

6.2 Floodplain Development %: **15.5**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **37 (0.8)**

6.6 Wavelength (Ratio): **237 (5.1)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **Bridge**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**1 Low**	**15**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.05**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, to South Newfane, Marlboro Branch

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **606**

2.1 Elevation Downstream: **541**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(6618) (1.25)**

2.3 Valley Slope (%): **0.98**

2.4 Channel Length (ft.)(mi.): **(7286) (1.38)**

2.5 Channel Slope (%): **0.89**

2.6 Sinuosity: **1.10**

2.7 Watershed Area (sq. mi.): **40.74**

2.8 Channel Width (ft.): **66.9**

2.9 Valley Width (ft.): **489**

2.10 Confinement Ratio: **7.3**

2.10 Confinement Type: **Broad**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Ice-Contact (60.6)**

3.3 Sub-dominant Geologic Material: **Alluvial**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (60.6)**

3.5 Soils - Flooding (%): **None/Rare (71.9)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Severe (63.1)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.5)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Residential**

4.2 Current Corridor Dominant Land Cover: **Urban (36.9)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **26-50**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.3 (1)**

5.3 Bank Armoring %: **1.6**

5.4 Channel Straightening %: **22.1**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **51.5**

6.2 Floodplain Development %: **20.9**

6.3 Channel Bars: **Point**

6.4 Meander Migration: **Migration**

6.5 Meander Width (Ratio): **50 (0.7)**

6.6 Wavelength (Ratio): **203 (3.0)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**2 High**	**0 N.S.**	**2 High**	**2 High**	**2 High**	**1 Low**	**2 High**	**2 High**	**2 High**	**1 Low**	**21**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.04**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, upstream of Baker Brook

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.68**

Step 2. Stream Type

2.1 Elevation Upstream: **541**

2.1 Elevation Downstream: **492**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2572) (0.49)**

2.3 Valley Slope (%): **1.91**

2.4 Channel Length (ft.)(mi.): **(2582) (0.49)**

2.5 Channel Slope (%): **1.90**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **41.60**

2.8 Channel Width (ft.): **67.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (51.7)**

3.3 Sub-dominant Geologic Material: **Alluvial**

3.4 Left Valley Side Slope: **Flat**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (75.7)**

3.5 Soils - Flooding (%): **None/Rare (71.6)**

3.5 Soils - Water Table Deep (%): **6.0 (74.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (74.0)**

3.5 Soils - Erodibility (%): **Severe (62.9)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.6)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (44.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **51-100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **3.1 (1)**

5.3 Bank Armoring %: **5.6**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **4.5**

6.3 Channel Bars: **Point**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**8**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.07**

Stream Name: **Baker Brook**

Topo Maps: **JAMAICA**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Headwaters of Baker Brook just below intersection of Newfane Rd and Gault Rd

1.2 Towns: **Wardsboro**

1.3 Downstream Latitude: **43.00**

1.3 Downstream Longitude: **-72.76**

Step 2. Stream Type

2.1 Elevation Upstream: **1640**

2.1 Elevation Downstream: **1476**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4892) (0.93)**

2.3 Valley Slope (%): **3.35**

2.4 Channel Length (ft.)(mi.): **(4902) (0.93)**

2.5 Channel Slope (%): **3.35**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.47**

2.8 Channel Width (ft.): **9.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Multiple**

3.3 Dominant Geologic Material (%): **Till (66.4)**

3.3 Sub-dominant Geologic Material: **Other**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **C (62.2)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (66.2)**

3.5 Soils - Water Table Shallow (%): **6.0 (66.2)**

3.5 Soils - Erodibility (%): **Severe (66.4)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (77.5)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (62.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Wetland**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **Impoundment**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**4**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.06**

Stream Name: **Baker Brook**

Topo Maps: **JAMAICA, NEWFANE, WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Baker Brook, remote stream running through a widening valley

1.2 Towns: **Newfane, Wardsboro**

1.3 Downstream Latitude: **43.00**

1.3 Downstream Longitude: **-72.75**

Step 2. Stream Type

2.1 Elevation Upstream: **1476**

2.1 Elevation Downstream: **1377**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3795) (0.72)**

2.3 Valley Slope (%): **2.61**

2.4 Channel Length (ft.)(mi.): **(3805) (0.72)**

2.5 Channel Slope (%): **2.60**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.48**

2.8 Channel Width (ft.): **15.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **C (86.2)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (80.1)**

3.5 Soils - Water Table Shallow (%): **6.0 (80.1)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (83.0)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (49.3)**

4.2 Current Corridor Sub-Dominant Land Cover: **---**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
High	**N.D.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.05**

Stream Name: **Baker Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Baker Brook, remote stream running through a narrow confining valley

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.98**

1.3 Downstream Longitude: **-72.73**

Step 2. Stream Type

2.1 Elevation Upstream: **1377**

2.1 Elevation Downstream: **1049**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(7227) (1.37)**

2.3 Valley Slope (%): **4.54**

2.4 Channel Length (ft.)(mi.): **(7237) (1.37)**

2.5 Channel Slope (%): **4.53**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.30**

2.8 Channel Width (ft.): **18.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Extremely Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (68.8)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (89.2)**

3.5 Soils - Water Table Shallow (%): **6.0 (89.2)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (87.0)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (55.9)**

4.2 Current Corridor Sub-Dominant Land Cover: **---**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Low	**N.D.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.D.**	**N.S.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.04**

Stream Name: **Baker Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Baker Brook, remote stream running through a narrow confining valley

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.97**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **1049**

2.1 Elevation Downstream: **770**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(8401) (1.59)**

2.3 Valley Slope (%): **3.32**

2.4 Channel Length (ft.)(mi.): **(8411) (1.59)**

2.5 Channel Slope (%): **3.32**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **5.98**

2.8 Channel Width (ft.): **28.8**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (99.3)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Extremely Steep**

3.4 Right Valley Side Slope: **Extremely Steep**

3.5 Soils - Hydrologic Group (%): **B (88.7)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (86.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (49.3)**

4.2 Current Corridor Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**1 Low**	**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.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**2**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.03-S1.02**

Stream Name: **Baker Brook Road Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Tributary to Baker Brook running along remainder of Baker Brook Rd up to headwaters

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.98**

1.3 Downstream Longitude: **-72.72**

Step 2. Stream Type

2.1 Elevation Upstream: **1607**

2.1 Elevation Downstream: **885**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(10353) (1.96)**

2.3 Valley Slope (%): **6.97**

2.4 Channel Length (ft.)(mi.): **(10363) (1.96)**

2.5 Channel Slope (%): **6.97**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.24**

2.8 Channel Width (ft.): **14.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (99.9)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (82.8)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (83.6)**

3.5 Soils - Water Table Shallow (%): **6.0 (83.6)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (85.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (45.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.9 (2)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **4.3**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **High**

7.3 Ice/Debris Jam Potential: **Culvert**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**1 Low**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**5**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.03-S1.01-S1.02**

Stream Name: **Baker Brook Road E. Branch Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Headwaters of Baker Brook tributary

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.99**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **1459**

2.1 Elevation Downstream: **1115**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3049) (0.58)**

2.3 Valley Slope (%): **11.28**

2.4 Channel Length (ft.)(mi.): **(3059) (0.58)**

2.5 Channel Slope (%): **11.25**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.22**

2.8 Channel Width (ft.): **6.8**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **C (88.5)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (86.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (52.9)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.0 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **4.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**1 Low**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**3**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.03-S1.01-S1.01**

Stream Name: **Baker Brook Road E. Branch Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Tributary to Baker Brook running between Baker Brook Rd and Hobby Hill Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.98**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **1115**

2.1 Elevation Downstream: **885**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2667) (0.51)**

2.3 Valley Slope (%): **8.62**

2.4 Channel Length (ft.)(mi.): **(2677) (0.51)**

2.5 Channel Slope (%): **8.59**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.81**

2.8 Channel Width (ft.): **11.9**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (100.0)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (79.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (63.5)**

4.2 Current Corridor Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Low	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.D.**	**N.S.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.03-S1.01**

Stream Name: **Baker Brook Road Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Baker Brook tributary along Baker Brook Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.97**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **885**

2.1 Elevation Downstream: **754**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2278) (0.43)**

2.3 Valley Slope (%): **5.75**

2.4 Channel Length (ft.)(mi.): **(2288) (0.43)**

2.5 Channel Slope (%): **5.73**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **2.47**

2.8 Channel Width (ft.): **19.5**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (100.0)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (84.1)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (46.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **0-25**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.2 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **135.5**

6.2 Floodplain Development %: **28.2**

6.3 Channel Bars: **Mid-channel**

6.4 Meander Migration: **Bifurcation**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Culvert**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**2 High**	**2 High**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**1 Low**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**14**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.03**

Stream Name: **Baker Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Baker Brook main stem, along Baker Brook Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.71**

Step 2. Stream Type

2.1 Elevation Upstream: **770**

2.1 Elevation Downstream: **672**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4672) (0.88)**

2.3 Valley Slope (%): **2.10**

2.4 Channel Length (ft.)(mi.): **(4682) (0.89)**

2.5 Channel Slope (%): **2.09**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **9.18**

2.8 Channel Width (ft.): **34.7**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Other (48.9)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Extremely Steep**

3.5 Soils - Hydrologic Group (%): **Not Rated (48.9)**

3.5 Soils - Flooding (%): **None/Rare (51.1)**

3.5 Soils - Water Table Deep (%): **6.0 (51.1)**

3.5 Soils - Water Table Shallow (%): **6.0 (51.1)**

3.5 Soils - Erodibility (%): **Severe (51.1)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (85.8)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (38.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.8 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **28.7**

6.2 Floodplain Development %: **26.8**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**11**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.02**

Stream Name: **Baker Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Baker Brook, along Baker Brook Rd near Parish Hill Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **672**

2.1 Elevation Downstream: **590**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(6180) (1.17)**

2.3 Valley Slope (%): **1.33**

2.4 Channel Length (ft.)(mi.): **(6190) (1.17)**

2.5 Channel Slope (%): **1.32**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **10.24**

2.8 Channel Width (ft.): **36.5**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (66.7)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **B (66.7)**

3.5 Soils - Flooding (%): **None/Rare (84.7)**

3.5 Soils - Water Table Deep (%): **6.0 (84.7)**

3.5 Soils - Water Table Shallow (%): **6.0 (84.7)**

3.5 Soils - Erodibility (%): **Very Severe (84.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (85.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (55.3)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.4 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **98.7**

6.2 Floodplain Development %: **30.2**

6.3 Channel Bars: **Mid-channel**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **33 (0.9)**

6.6 Wavelength (Ratio): **33 (0.9)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**1 Low**	**16**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.01-S1.02**

Stream Name: **Newfane Hill Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Headwaters of tributary. Southern side of Newfane Hill

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **1377**

2.1 Elevation Downstream: **803**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3848) (0.73)**

2.3 Valley Slope (%): **14.92**

2.4 Channel Length (ft.)(mi.): **(3858) (0.73)**

2.5 Channel Slope (%): **14.88**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.43**

2.8 Channel Width (ft.): **9.0**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (87.8)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **B (56.6)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (68.8)**

3.5 Soils - Water Table Shallow (%): **6.0 (68.8)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (75.6)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (47.5)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**1 Low**	**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.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**3**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.01-S1.01-S3.01**

Stream Name: **Newfane/Timson Hill Tributary Three**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Branch 3 of tributary. Crossed by Timson Hill Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **1180**

2.1 Elevation Downstream: **787**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(1574) (0.30)**

2.3 Valley Slope (%): **24.97**

2.4 Channel Length (ft.)(mi.): **(1584) (0.30)**

2.5 Channel Slope (%): **24.81**

2.6 Sinuosity: **1.01**

2.7 Watershed Area (sq. mi.): **0.05**

2.8 Channel Width (ft.): **3.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (99.6)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (99.6)**

3.5 Soils - Water Table Shallow (%): **6.0 (99.6)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (38.0)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (30.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **0-25**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.7 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **17.4**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **None**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**7**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.01-S1.01-S2.01**

Stream Name: **Newfane/Timson Hill Tributary Two**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Branch 2 of tributary. Crossed by Timson Hill Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **1082**

2.1 Elevation Downstream: **754**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(1715) (0.32)**

2.3 Valley Slope (%): **19.13**

2.4 Channel Length (ft.)(mi.): **(1725) (0.33)**

2.5 Channel Slope (%): **19.01**

2.6 Sinuosity: **1.01**

2.7 Watershed Area (sq. mi.): **0.15**

2.8 Channel Width (ft.): **5.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (73.3)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (73.3)**

3.5 Soils - Water Table Shallow (%): **6.0 (73.3)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (76.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Crop**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (48.6)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.8 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **10.7**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **None**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**7**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.01-S1.01-S1.01**

Stream Name: **Newfane/Timson Hill Tributary One**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Branch 1 of tributary. Crossed by Timson Hill Rd

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.96**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **984**

2.1 Elevation Downstream: **754**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2118) (0.40)**

2.3 Valley Slope (%): **10.86**

2.4 Channel Length (ft.)(mi.): **(2128) (0.40)**

2.5 Channel Slope (%): **10.81**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.09**

2.8 Channel Width (ft.): **4.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (79.5)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (79.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (79.5)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (88.1)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (49.5)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.2 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **2.1**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **None**

7.2 Bank Height: **Low**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1 Low	**1 Low**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.S.**	**0 N.S.**	**3**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.01-S1.01**

Stream Name: **Newfane Hill Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Small tributary in narrow valley

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.69**

Step 2. Stream Type

2.1 Elevation Upstream: **803**

2.1 Elevation Downstream: **590**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4798) (0.91)**

2.3 Valley Slope (%): **4.44**

2.4 Channel Length (ft.)(mi.): **(4808) (0.91)**

2.5 Channel Slope (%): **4.43**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.05**

2.8 Channel Width (ft.): **13.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (95.4)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **C (83.7)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **3.5 (83.7)**

3.5 Soils - Water Table Shallow (%): **2.0 (83.7)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (72.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (49.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
High	**Low**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.D.**	**N.S.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T2.03-S2.01**

Stream Name: **Baker Brook**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Mouth of Baker Brook, Williamsville Village

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.94**

1.3 Downstream Longitude: **-72.68**

Step 2. Stream Type

2.1 Elevation Upstream: **590**

2.1 Elevation Downstream: **475**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5141) (0.97)**

2.3 Valley Slope (%): **2.24**

2.4 Channel Length (ft.)(mi.): **(5151) (0.98)**

2.5 Channel Slope (%): **2.23**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **11.95**

2.8 Channel Width (ft.): **39.0**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Ice-Contact (97.1)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Very Steep**

3.4 Right Valley Side Slope: **Steep**

3.5 Soils - Hydrologic Group (%): **A (97.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (100.0)**

3.5 Soils - Water Table Shallow (%): **6.0 (100.0)**

3.5 Soils - Erodibility (%): **Very Severe (99.6)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (83.4)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (41.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.2 (2)**

5.3 Bank Armoring %: **41.5**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **60.3**

6.2 Floodplain Development %: **30.0**

6.3 Channel Bars: **None**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Gravel**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **Bridge**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**2 High**	**0 N.S.**	**1 Low**	**2 High**	**0 Unk.**	**0 N.S.**	**2 High**	**2 High**	**0 N.S.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**1 Low**	**1 Low**	**15**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.03-S1.01**

Stream Name: **Timson Hill Tributary**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Small brook along Timson Hill Road

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.68**

Step 2. Stream Type

2.1 Elevation Upstream: **787**

2.1 Elevation Downstream: **524**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(4061) (0.77)**

2.3 Valley Slope (%): **6.48**

2.4 Channel Length (ft.)(mi.): **(4071) (0.77)**

2.5 Channel Slope (%): **6.46**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **0.28**

2.8 Channel Width (ft.): **7.4**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Step-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **None**

3.3 Dominant Geologic Material (%): **Till (92.6)**

3.3 Sub-dominant Geologic Material: **Ice-Contact**

3.4 Left Valley Side Slope: **Hilly**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **B (61.1)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (68.5)**

3.5 Soils - Water Table Shallow (%): **6.0 (68.5)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (75.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Urban (24.4)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.4 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **28.7**

6.2 Floodplain Development %: **16.4**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Step-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**2 High**	**1 Low**	**0 N.D.**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**0 N.D.**	**0 N.D.**	**9**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.03**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, through Williamsville village

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.67**

Step 2. Stream Type

2.1 Elevation Upstream: **492**

2.1 Elevation Downstream: **459**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(2873) (0.54)**

2.3 Valley Slope (%): **1.15**

2.4 Channel Length (ft.)(mi.): **(2883) (0.55)**

2.5 Channel Slope (%): **1.14**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **54.04**

2.8 Channel Width (ft.): **75.8**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Riffle-Pool**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Multiple**

3.3 Dominant Geologic Material (%): **Ice-Contact (78.9)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Flat**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (78.9)**

3.5 Soils - Flooding (%): **None/Rare (91.5)**

3.5 Soils - Water Table Deep (%): **6.0 (98.2)**

3.5 Soils - Water Table Shallow (%): **6.0 (98.2)**

3.5 Soils - Erodibility (%): **Very Severe (91.5)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.7)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Residential**

4.2 Current Corridor Dominant Land Cover: **Urban (50.0)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **26-50**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **Impoundment**

5.2 Bridges and Culverts % (Number): **2.6 (1)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **17.4**

5.5 Dredging History **Dredging**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **76.4**

6.2 Floodplain Development %: **6.9**

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **Migration**

6.5 Meander Width (Ratio): **17 (0.2)**

6.6 Wavelength (Ratio): **143 (1.9)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Riffle-Pool**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **High**

7.3 Ice/Debris Jam Potential: **Multiple**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**1 Low**	**1 Low**	**0 N.S.**	**1 Low**	**1 Low**	**2 High**	**1 Low**	**1 Low**	**1 Low**	**2 High**	**2 High**	**1 Low**	**2 High**	**21**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.02**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem, below Williamsville village

1.2 Towns: **Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.66**

Step 2. Stream Type

2.1 Elevation Upstream: **459**

2.1 Elevation Downstream: **442**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(3683) (0.70)**

2.3 Valley Slope (%): **0.46**

2.4 Channel Length (ft.)(mi.): **(3693) (0.70)**

2.5 Channel Slope (%): **0.46**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **55.69**

2.8 Channel Width (ft.): **76.8**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrow**

2.11 Reference Stream Type: **C**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **Yes**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Ice-Contact (76.9)**

3.3 Sub-dominant Geologic Material: **Alluvial**

3.4 Left Valley Side Slope: **Flat**

3.4 Right Valley Side Slope: **Hilly**

3.5 Soils - Hydrologic Group (%): **A (75.1)**

3.5 Soils - Flooding (%): **None/Rare (76.9)**

3.5 Soils - Water Table Deep (%): **6.0 (92.4)**

3.5 Soils - Water Table Shallow (%): **6.0 (92.4)**

3.5 Soils - Erodibility (%): **Severe (59.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.6)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Field**

4.2 Current Corridor Dominant Land Cover: **Urban (44.7)**

4.2 Current Corridor Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer - Left Bank: **0-25**

4.3 Riparian Buffer - Right Bank: **0-25**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **49.0**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **98.0**

6.2 Floodplain Development %: **30.1**

6.3 Channel Bars: **Point**

6.4 Meander Migration: **Bifurcation**

6.5 Meander Width (Ratio): **76 (1.0)**

6.6 Wavelength (Ratio): **76 (1.0)**

Step 7. Windshield Survey

7.1 Reference Stream Type: **C**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **Low**

7.2 Bank Height: **Medium**

7.3 Ice/Debris Jam Potential: **None**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**1 Low**	**0 N.S.**	**0 N.S.**	**0 N.S.**	**2 High**	**0 N.S.**	**2 High**	**2 High**	**1 Low**	**1 Low**	**2 High**	**2 High**	**1 Low**	**0 N.S.**	**18**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.01**

Stream Name: **Rock River Main Stem**

Topo Maps: **NEWFANE**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Mouth of the Rock River

1.2 Towns: **Dummerston, Newfane**

1.3 Downstream Latitude: **42.95**

1.3 Downstream Longitude: **-72.64**

Step 2. Stream Type

2.1 Elevation Upstream: **442**

2.1 Elevation Downstream: **360**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(7989) (1.51)**

2.3 Valley Slope (%): **1.03**

2.4 Channel Length (ft.)(mi.): **(7999) (1.51)**

2.5 Channel Slope (%): **1.03**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **57.61**

2.8 Channel Width (ft.): **78.0**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Semi-confined**

2.11 Reference Stream Type: **B**

2.12 Bedform: **Plane Bed**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Ice-Contact (56.5)**

3.3 Sub-dominant Geologic Material: **Till**

3.4 Left Valley Side Slope: **Steep**

3.4 Right Valley Side Slope: **Very Steep**

3.5 Soils - Hydrologic Group (%): **A (56.5)**

3.5 Soils - Flooding (%): **None/Rare (94.7)**

3.5 Soils - Water Table Deep (%): **6.0 (94.7)**

3.5 Soils - Water Table Shallow (%): **6.0 (94.7)**

3.5 Soils - Erodibility (%): **Very Severe (94.7)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (82.5)**

4.1 Current Watershed Sub-Dominant Land Cover: **Urban**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (36.5)**

4.2 Current Corridor Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **1.1 (1)**

5.3 Bank Armoring %: **1.6**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **17.2**

6.2 Floodplain Development %: **5.6**

6.3 Channel Bars: **Point**

6.4 Meander Migration: **None**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **B**

7.1 Dominant Bed Form: **Plane Bed**

7.1 Sub-class Slope: **c**

7.1 Bed Material: **Cobble**

7.2 Bank Erosion: **High**

7.2 Bank Height: **High**

7.3 Ice/Debris Jam Potential: **Bend**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
2 High	**2 High**	**0 N.S.**	**0 N.S.**	**1 Low**	**0 N.S.**	**0 Unk.**	**0 N.S.**	**1 Low**	**1 Low**	**2 High**	**0 N.S.**	**0 Unk.**	**0 Unk.**	**2 High**	**1 Low**	**12**

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Stream Geomorphic Assessment VT DEC

West River - Rock River

Basin: **West, Saxton's, Williams** Watershed: **West River** Sub-watershed: **West River -- Wardsboro Brook to mouth**

Phase 1 - Reach Summary Report

Reach ID: **T02.14**

Stream Name: **Rock River Main Stem**

Topo Maps: **WEST DOVER**

Date last editied: **2006-08-04 12:00:00.0**

Is Reach an Impoundment? **No**

Step 1. Reach Location

1.1 Reach Description: Rock River main stem headwaters in the Green Mountain National Forest

1.2 Towns: **Dover**

1.3 Downstream Latitude: **42.97**

1.3 Downstream Longitude: **-72.81**

Step 2. Stream Type

2.1 Elevation Upstream: **2460**

2.1 Elevation Downstream: **1771**

2.1 Is Gradient Gentle? **No**

2.2 Valley Length (ft.)(mi.): **(5011) (0.95)**

2.3 Valley Slope (%): **13.75**

2.4 Channel Length (ft.)(mi.): **(5021) (0.95)**

2.5 Channel Slope (%): **13.72**

2.6 Sinuosity: **1.00**

2.7 Watershed Area (sq. mi.): **1.49**

2.8 Channel Width (ft.): **15.6**

2.9 Valley Width (ft.):

2.10 Confinement Ratio:

2.10 Confinement Type: **Narrowly Confined**

2.11 Reference Stream Type: **A**

2.12 Bedform: **Cascade**

Step 3. Basin Characteristics: Geology and Soils

3.1 Alluvial Fan: **None**

3.2 Grade Control: **Ledge**

3.3 Dominant Geologic Material (%): **Till (100.0)**

3.3 Sub-dominant Geologic Material: **---**

3.4 Left Valley Side Slope: **Extremely Steep**

3.4 Right Valley Side Slope: **Extremely Steep**

3.5 Soils - Hydrologic Group (%): **D (43.3)**

3.5 Soils - Flooding (%): **None/Rare (100.0)**

3.5 Soils - Water Table Deep (%): **6.0 (57.4)**

3.5 Soils - Water Table Shallow (%): **6.0 (57.4)**

3.5 Soils - Erodibility (%): **Very Severe (100.0)**

Step 4. Land Cover - Reach Hydrology

4.1 Historic Watershed Land Cover: **Forest**

4.1 Current Watershed Dominant Land Cover (%): **Forest (89.2)**

4.1 Current Watershed Sub-Dominant Land Cover: **Crop**

4.2 Historic Corridor Land Cover: **Forest**

4.2 Current Corridor Dominant Land Cover: **Forest (46.2)**

4.2 Current Corridor Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer - Left Bank: **>100**

4.3 Riparian Buffer - Right Bank: **>100**

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation: **None**

5.2 Bridges and Culverts % (Number): **0.0 (0)**

5.3 Bank Armoring %: **None**

5.4 Channel Straightening %: **None**

5.5 Dredging History **None**

Step 6. Floodplain Modifications

6.1 Berms and Roads %: **None**

6.2 Floodplain Development %: **0.0**

6.3 Channel Bars: **No Data**

6.4 Meander Migration: **No Data**

6.5 Meander Width (Ratio): **( )**

6.6 Wavelength (Ratio): **( )**

Step 7. Windshield Survey

7.1 Reference Stream Type: **A**

7.1 Dominant Bed Form: **Cascade**

7.1 Sub-class Slope: **None**

7.1 Bed Material: **No Data**

7.2 Bank Erosion: **No Data**

7.2 Bank Height: **No Data**

7.3 Ice/Debris Jam Potential: **No Data**

7.4 Comments:

Step 8. Impact Rating

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	7.2	7.3	Total
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Low	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**N.S.**	**Unk.**	**N.S.**	**N.S.**	**N.S.**	**N.D.**	**N.D.**	**Unk.**	**Unk.**	**N.D.**	**N.D.**	

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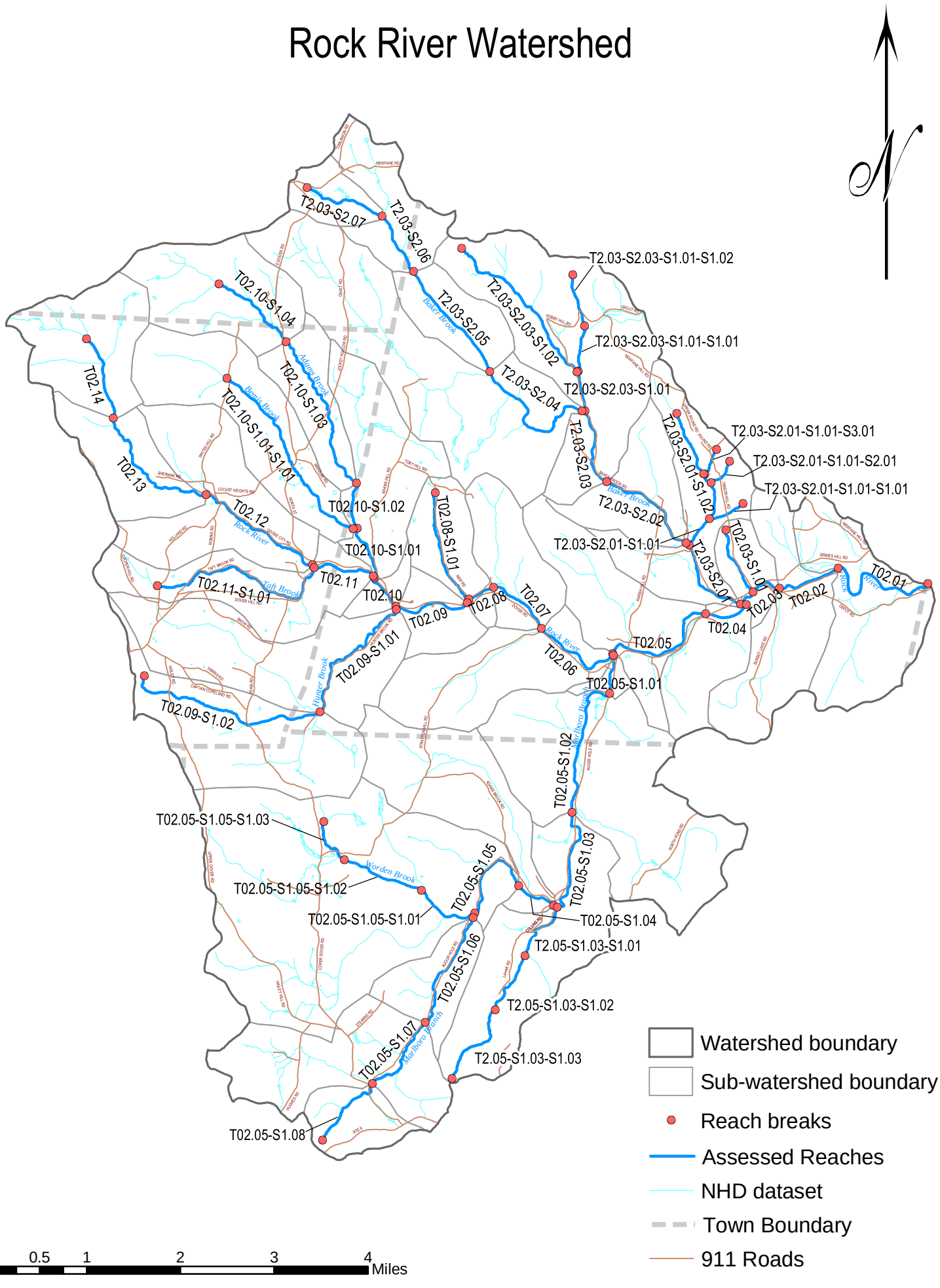
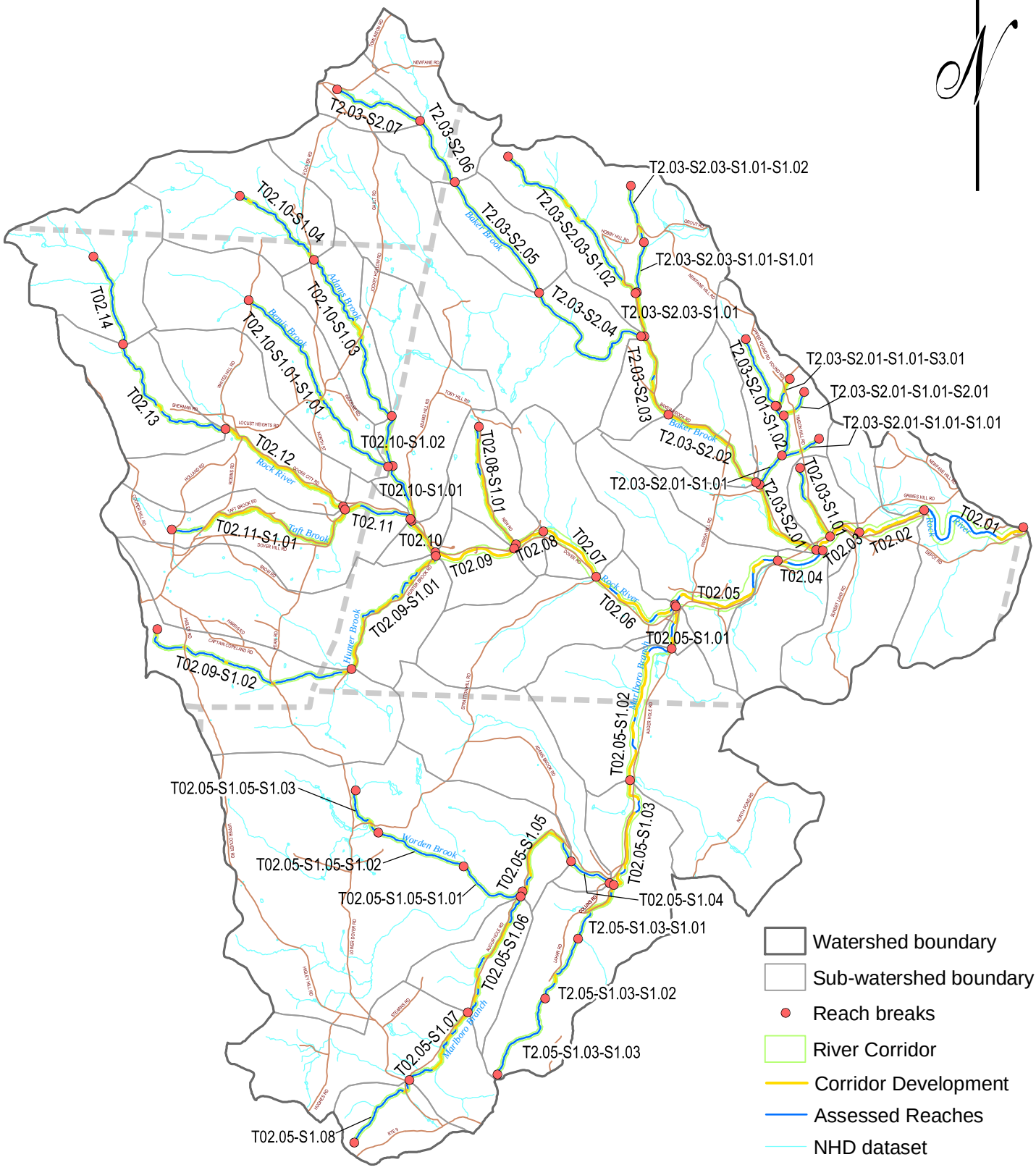
Appendix B

Figures 1.1-5.2 Printed .pdf Versions

Rock River Watershed

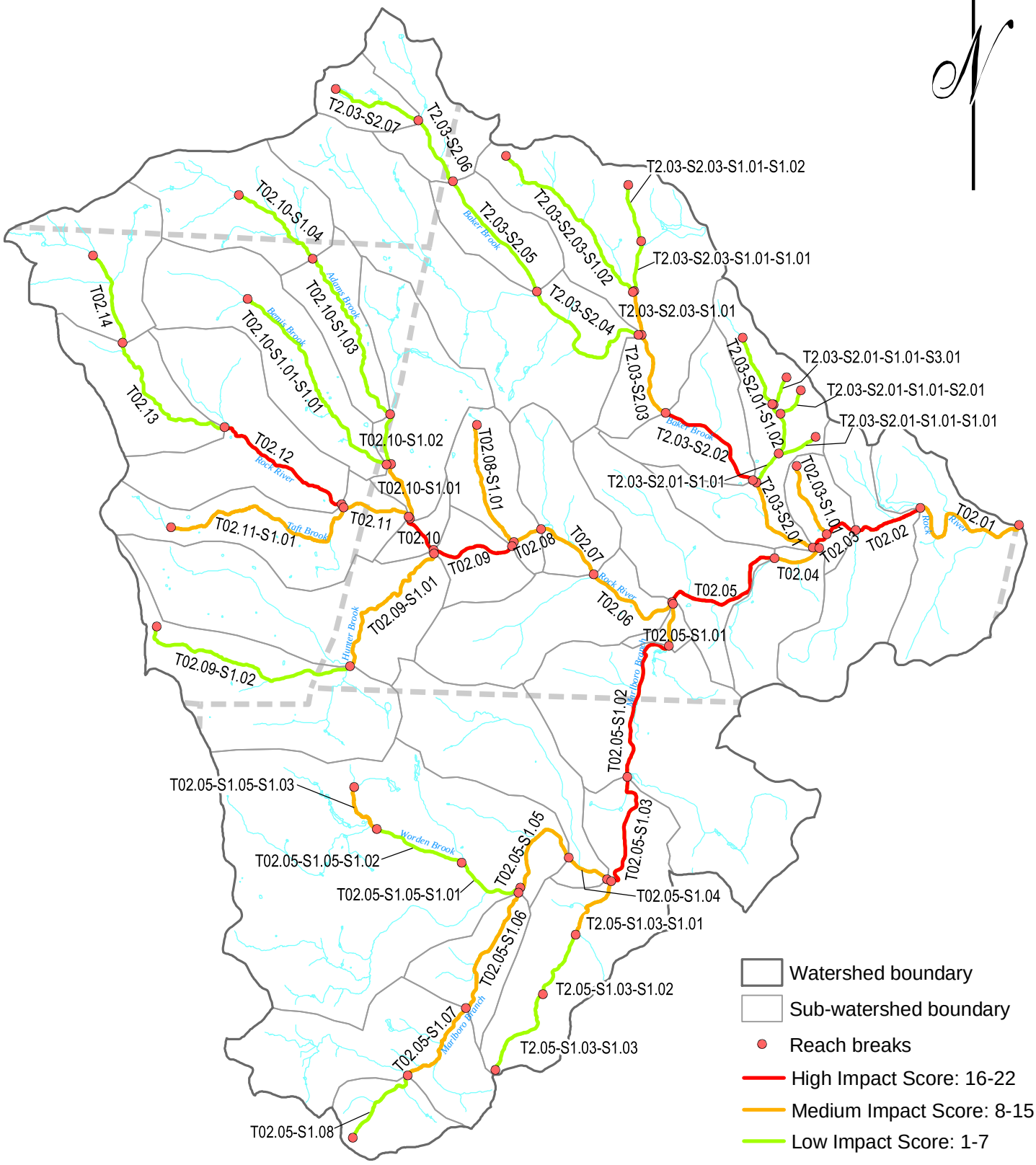


Rock River Watershed
River Corridor Development



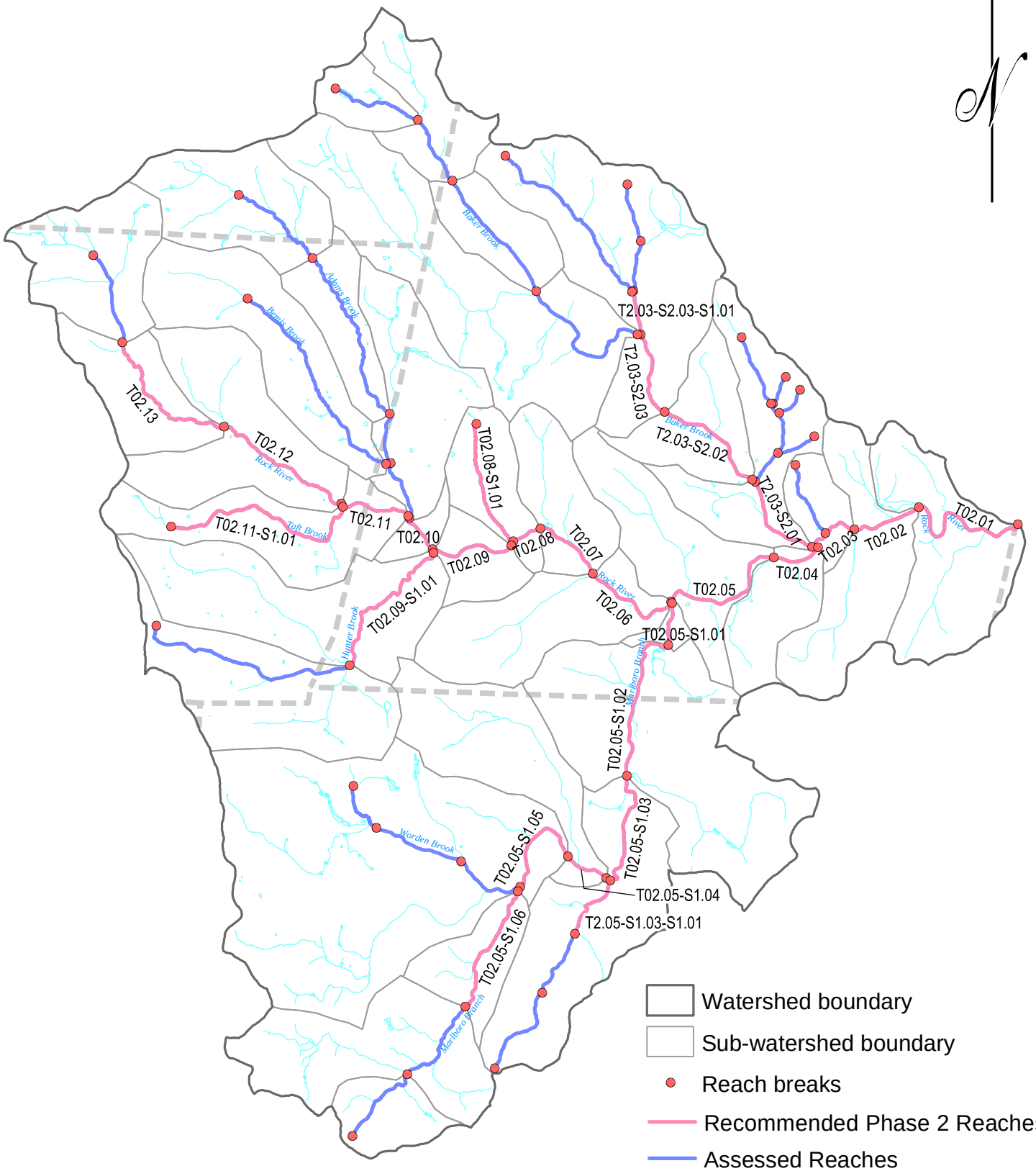
Corridor Developments include residential and commercial areas, public and private roadways, and land under agricultural use such as hay and crop fields.

Rock River Watershed
Impact Scores by Reach



Impact Scores are out of a total possible score of 32. The maximum score for the Rock River Watershed was 22. Scores were ranked from highest to lowest and assigned to either the High, Medium, or Low Impact Score grouping.

Rock River Watershed
Recommended Phase 2 Reaches



Reaches recommended based on calculated Impact Score as well as local knowledge of existing erosion hazards