Bear Creek Environmental

Mid-Winooski Watershed
Phase I Stream Geomorphic Assessment
Chittenden, Washington, and Lamoille County, Vermont

June 20, 2007

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Mid-Winooski River Watershed
Phase I Stream Geomorphic Assessments

EXECUTIVE SUMMARY

A Phase I Stream Geomorphic Assessment of the Winooski River watershed was conducted by Bear Creek Environmental under the direction of the Central Vermont Trout Unlimited (CVTU). CVTU is currently conducting Bridge and culvert assessments of the Phase I reaches. These assessments provide information about the physical condition of the Winooski River watershed and the factors that influence the stability of the river system.

The Phase I study used a combination of remote sensing (i.e. mapping) and windshield surveys to examine the natural and human disturbances that may have influenced the Winooski River watershed. The protocols developed by the Vermont Agency of Natural Resources were used to complete the Phase Iassessment. The focus of the Phase I study is to evaluate impacts that may cause channel adjustment such as floodplain modifications, channel modifications, and land use. Of the sixteen parameters measured during the Phase I Assessment, corridor land use, berms and roads and river corridor development were the categories identified as having the greatest potential for causing channel adjustment on the Winooski River main stem. A review of orthophotos and topographic maps show the main stem lacks a high quality riparian zone. Considerable development, roads, and railroads occur within the corridor. The orthophotos and topographic maps also show that most of the main stem reaches have been historically straightened. On the major tributaries, (lower Little River downstream of the Waterbury Reservoir, Great Brook, Graves Brook, Thatcher Brook, Jones Brook, Crossett Brook, Ridley Brook, Preston Brook, Gleason Brook, Snipe Island Brook, Duck Brook, and Joiner Brook) corridor and watershed land use were the categories that had the greatest potential for causing channel adjustment. There was also considerable impact from bridges and culverts, berms and roads, channel modifications, meander belt width, and average meander wavelength on these tributaries.

Most of the Winooski River main stem reaches have stream types that are very susceptible to shifts in both lateral and vertical stability caused by direct channel disturbance, the removal and alteration of streambank vegetation, and changes in the flow and sediment regimes of the contributing watershed. The stream geomorphic assessment information presented in this report will be used as the basis for recommending reaches for Phase 2 Geomorphic Assessment within the Winooski River watershed. Due to the high level of observed impact and reach condition, all of the main stem reaches were recommended for a Phase 2 assessment. Twenty-eight tributary reaches were recommended for Phase 2 assessments.

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1.0 PROJECT OVERVIEW AND BACKGROUND

Bear Creek Environmental (BCE) was retained by Central Vermont Trout Unlimited (CVTU), as part of a grant with the Vermont River Management Program, to conduct a Phase 1 Stream Geomorphic Assessment in the Winooski River watershed from Gateway Park in Montpelier to the confluence with Alder Brook in Essex Junction. The Winooski River has undergone significant channel alterations in the past as well as considerable development within the river's corridor. This Phase 1 assessment provides a stream impact rating that enables a priority ranking for each reach. This ranking can be used to determine where more detailed Phase 2 Geomorphic Assessments should be conducted within the watershed.

The Phase 1 information available for the entire Winooski River watershed is summarized in Section 2 of this report. Full Phase 1 Geomorphic Assessments were conducted on the Winooski River Watershed from Gateway Park in Montpelier to the confluence of Alder Brook in Essex, Vermont, including the following tributaries; in Washington County: lower Little River (downstream of Waterbury Reservoir), Great Brook, Graves Brook, Thatcher Brook, Jones Brook, Crossett Brook, and Ridley Brook; in Chittenden County: Preston Brook, Gleason Brook, Snipe Island Brook, Duck Brook, and Joiner Brook. Phase 1 Assessment steps that are generated through the Stream Geomorphic Assessment Tool (SGAT) were conducted on minor tributaries whose watershed areas comprise more than 10 percent of major tributary watersheds. Other major tributaries included in the drainage area of the Mid-Winooski, such as the Mad River, Huntington River, and the mid and upper Little River have been or will be assessed under other studies.

1.1 Description of Study Area

The Winooski River is one of the major rivers in Vermont within the Lake Champlain Basin (Figure 1). The portion of the watershed that was studied lies within the counties of Chittenden, Washington, and Lamoille. For the purposes of this assessment, this study area is referred to as the Mid-Winooski River watershed and includes the following major tributaries: Snipe Island Brook, Duck Brook, Preston Brook, Joiner Brook, Gleason Brook, Ridley Brook, Lower Little River, Graves Brook, Thatcher Brook, Crossett Brook, Great Brook and Jones Brook (Figure 2). The Mid-Winooski River watershed is dominated by forested land. However, agricultural fields, cropland, or urban land are sub-dominant land uses within the watershed.

The Winooski River Valley was reshaped primarily by glacial activity. From most of the outcrops along Route 89, which parallels the Winooski River, glacial striations in the bedrock reveal evidence of the ice movement (Van Diver, 1987). The last large ice sheet, the Laurentide Ice Sheet, covered all of New England and advanced up the Winooski River valley (Wright and Larsen, 2004). As the climate warmed, the glacier slowly retreated and formed glacial Lake Winooski, covering the Winooski valley and many tributaries upstream from Waterbury (Van Diver, 1987). Following the retreat of the glacier, the Winooski River and its tributaries began eroding the deposited glacial and lake sediments (Wright and Larsen, 2004). The surficial sediments within the valley are primarily glacial till, lake bottom sediments left from Lake Winooski, and alluvium.

The Mid-Winooski River flows through a very gentle gradient valley. The upper-most reach (R16), which begins in Montpelier, is approximately 200 feet in elevation above the lowest reach in Essex (R07). Except for reach R15, which has a channel slope of 1 percent, all reaches in the main stem of the Mid-Winooski River have a channel slope of less than 1percent. Table 1 shows the greatest slopes (usually in the most upstream reach) and the slope ranges in the other reaches in each major tributary included in this assessment.

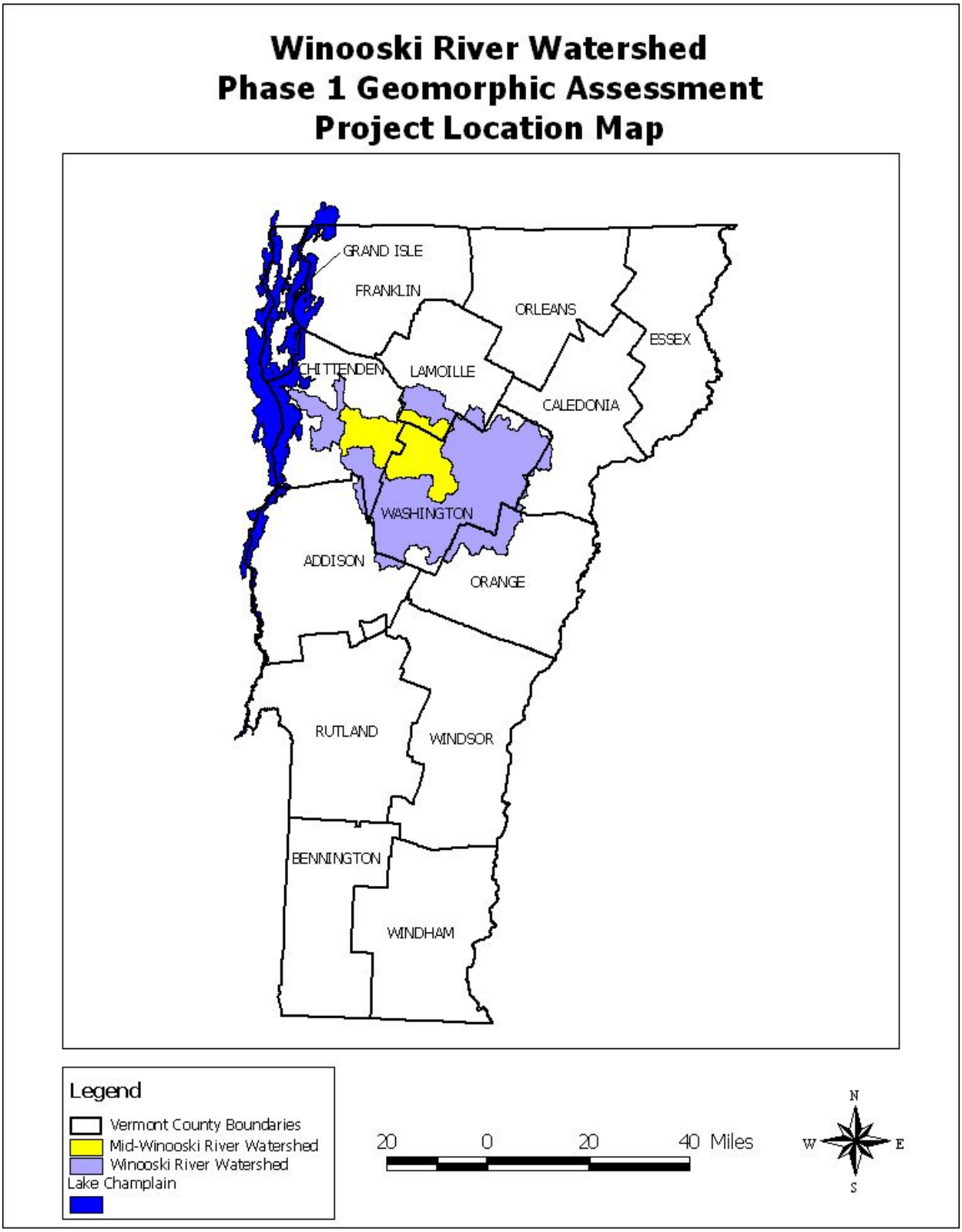

Figure 1. Project Location Map for the Phase 1 Assessment

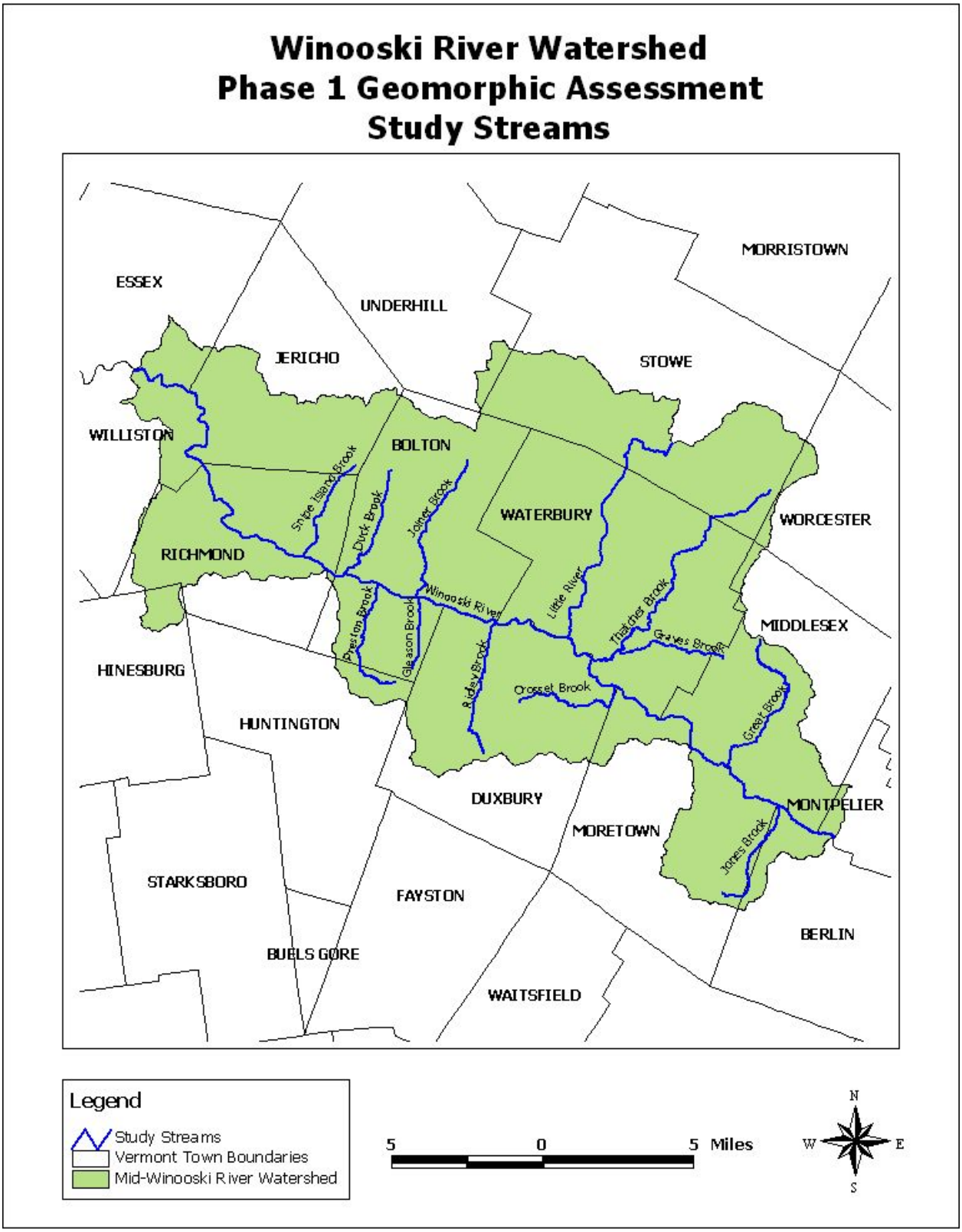

Figure 2. Streams Studied within the Mid-Winooski River Watershed for the Phase 1 Assessment

Table 1. Major Tributary Slopes		
Tributary	**Greatest Reach Slope**	**Range of other Reach Slopes**
Snipe Island Brook	4 %	<1 – 3 %
Duck Brook	18 %	1 – 4 %
Preston Brook	14 %	3 – 9 %
Joiner Brook	13 %	3 – 9 %
Gleason Brook	20 %	7 – 13 %
Ridley Brook	17 %	3 – 6 %
Lower Little River	0.5 %	0.2 – 0.5 %
Graves Brook	17 %	<1 – 5 %
Thatcher Brook	18 %	<1 – 4 %
Crossett Brook	13 %	<1 – 5 %
Great Brook	7 %	1 – 4 %
Jones Brook	8 %	1 – 2 %

The tributary that runs through the steepest valley is Gleason Brook. Snipe Island Brook, Great Brook and Jones Brook flow through relatively gentle gradient valleys. The lower part of the Little River flows through a very gentle gradient valley.

1.2 Flood History

Between 1995 and 1998 Vermonters suffered nearly $60,000,000 in flood damages; much of these losses were avoidable (Vermont Agency of Natural Resources 2006b). Through Vermont's history, flood waters on the Winooski River have destroyed property on numerous occasions. In order to better understand the flood history of Winooski River, long term peak discharge data from the U.S. Department of the Interior, U.S. Geological Survey (USGS) gauge on the Mad River at Moretown, VT and the Dog River at Northfield Falls, VT was obtained. Both the Mad River and the Dog River are major tributaries to the Winooski River within the project area.

The Mad River gauge provides a continuous record of flow from 1928 through the present. The drainage area at the Mad River gauge is 139 square miles. The Mad River confluence

with the Winooski River is located at the start of reach R15 near the border Middlesex and Moretown. The long term record for Mad River shows a 10 year discharge occurred in water year[1] 1982 and was exceeded in water year 1976. Approximately a 25 year discharge occurred in 1998. During water year 1938, the peak discharge exceeded the projected 50 year discharge. A graph of the flood frequency analysis is provided in Figure 3 below.

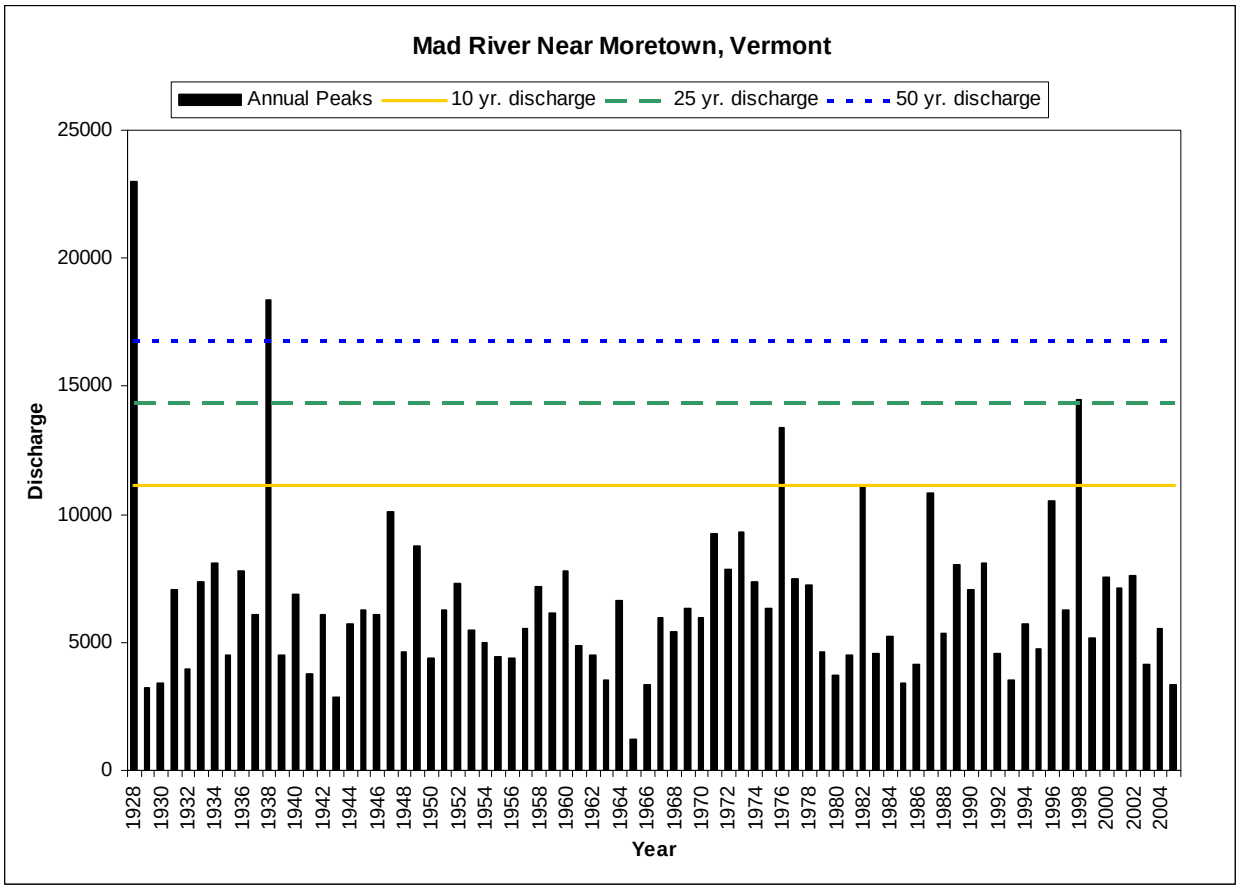

Figure 3: Flood frequency analysis for the Mad River.

Long term peak discharge data from the U.S. Department of the Interior, U.S. Geological Survey (USGS) gauge on the Dog River at Northfield Falls, VT was also used. The gauge provides a continuous record of flow from 1935 through the present. The drainage area at the Dog River gauge is 76 square miles. The confluence of this tributary with the Winooski River is located at the terminal point of the study area.

[1] A water year is a twelve month period from October 1 through September 30

The Dog River record shows that the 10 year discharge was exceeded in water years 1952, 1976, 1987 and 1989 and between a 25 and 50 year discharge occurred in 1938. During water year 1973, the peak discharge exceeded the projected 50 year discharge. It is interesting that the 25 year discharge occurred on the Mad River in 1998, but in the Dog River. Not even the 10 year discharge was exceeded on the Dog River in that year. A graph of the flood frequency analysis is provided in Figure 4.

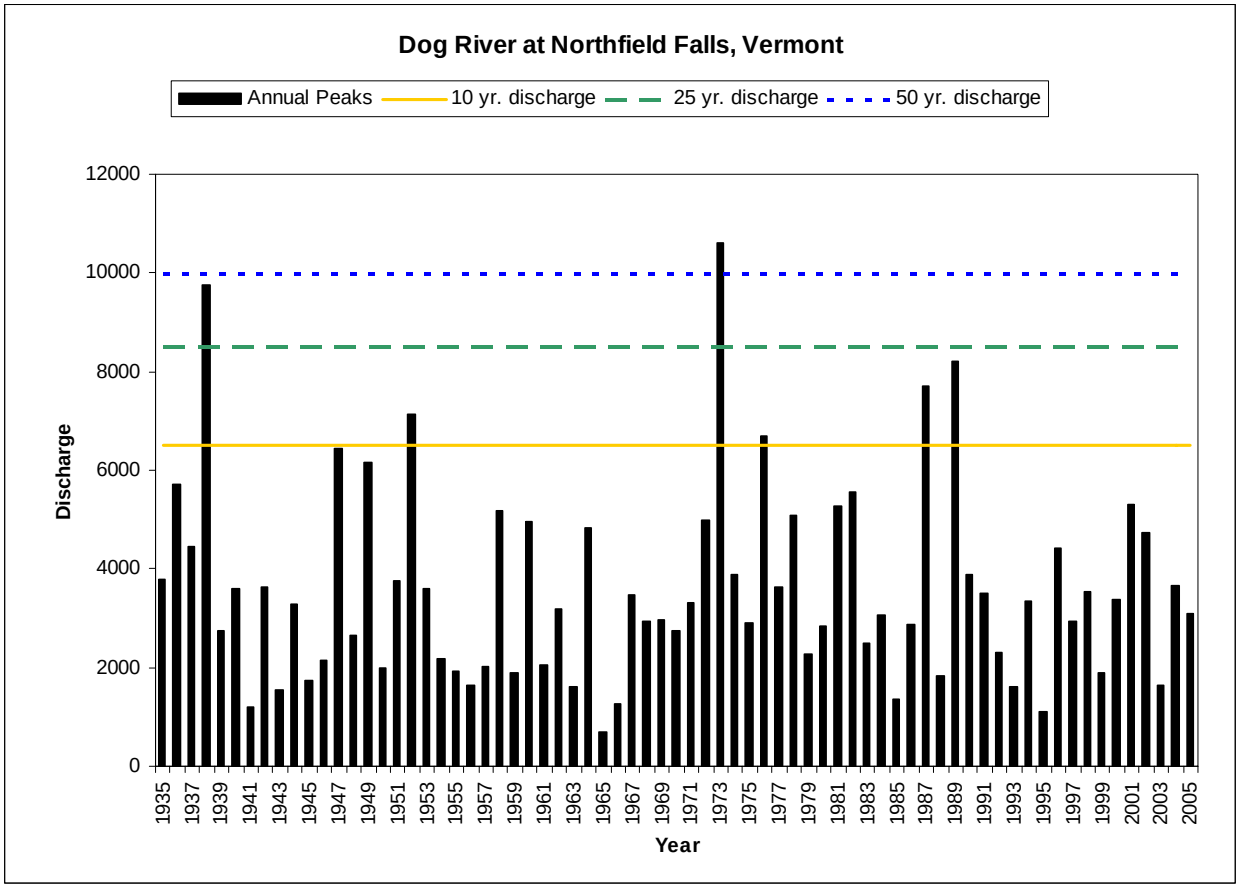

Figure 4: Flood frequency analysis for the Dog River.

1.3 Previous Studies

The Winooski River has been previously studied to observe erosion impacts and historic restoration efforts along the river. For a Master's thesis, Joseph Kasvinsky evaluated various erosion control measures along the lower Winooski River. This study observed the efforts of Project Vermont, which was a stream restoration project conducted mostly in the late 1930s. As part of this project, seriously eroded banks (mostly in between Essex Junction and Richmond) were repaired using erosion control measures (Kasvinsky, 1968). Another study within the Winooski Watershed also looked at the effectiveness of erosion control measures initiated through Project Vermont (Ryan and Short). Surveys of Project Vermont riparian areas were conducted in the mid 1990s. Erosion control measures were evaluated for both past and present effectiveness. This study also observed changes in stream morphology as well as riparian species surveys in relation to the Project Vermont efforts.

2.0 PHASE 1 STREAM GEOMORPHIC ASSESSMENT

2.1 Phase 1 Methodology

The Phase 1 assessment was conducted by BCE following procedures specified in the Vermont Stream Geomorphic Assessment Handbook Phase 1 (Vermont Agency of Natural Resources 2006a), and used version 4.53 of the Stream Geomorphic Assessment Tool (SGAT) GIS extension. Due to the extent of this large watershed, analysis of the Phase 1 data for all of the Phase 1 parameters was limited to the main stem reaches of the Winooski River and the following major tributaries: Snipe Island Brook, Duck Brook, Preston Brook, Joiner Brook, Gleason Brook, Ridley Brook, Lower Little River, Graves Brook, Thatcher Brook, Crossett Brook, Great Brook and Jones Brook. Tributaries comprising more than 10 percent of the drainage area of major tributaries listed above were only evaluated for those Phase 1 parameters obtained through the SGAT analysis. Assessment data were recorded on the DEC Phase 1 data sheets or obtained digitally, and when possible, entered or uploaded into the Vermont River Management Program's Data Management System (DMS).

2.2 Phase 1 Parameters

During the Phase 1 Assessment, data were collected for each parameter in Table 2. The parameters were then rated according to the following menu options (NS – not significant, low impact, high impact or No data). A zero was scored for options NS and No data, a one for low impact and a two for high impact.

Table 2. Parameters Included in Impact Scores

Step #	Parameter
4.1	Watershed Land Cover/ Land Use
4.2	Corridor Land Cover/ Land Use
4.3	Riparian Buffer Width
5.1	Flow Regulations and Water Withdrawals
5.2	Bridges and Culverts
5.3	Bank Armoring and Revetments
5.4	Channel Modifications
5.5	Dredging and Gravel Mining History
6.1	Berms and Roads
6.2	River Corridor Development
6.3	Depositional Features
6.4	Meander Migration / Channel Avulsion
6.5	Meander Width Ratio
6.6	Wavelength Ratio
7.2	Bank Erosion – Relative Magnitude
7.3	Ice and Debris Jam Potential

The feature indexing tool (FIT) (a computer mapping program) was used to map impact features observed in the following steps:

- Step 3.1 Alluvial Fan
- Step 3.2 Grade Control
- Step 5.2 Bridges and Culverts
- Step 5.3 Bank Armoring and Revetment
- Step 5.4 Channel Straightening
- Step 5.5 Dredging and Gravel Mining
- Step 6.1 Berms and Roads (Encroachments)
- Step 6.2 River Corridor Development
- Step 6.4 Meander Migration / Channel Avulsions
- Step 7.2 Erosion

This tool is an extension of ArcView (a computer mapping program) and utilizes the Vermont Hydrography Dataset (VHD) to automate measuring the length of impact on stream segments and the placement of impact points along the stream. The FIT generated an attribute table, which was uploaded to the DMS. GIS shapefiles were created for other parameters such as Step 6.3 Depositional Features, as well as points of photos taken during the windshield survey.

2.3 Phase 1 QA Review

To assure a high level of confidence in the Phase 1 SGA data, strict QA/QC (Quality Assurance/Quality Control) procedures were followed by BCE. These procedures involved a thorough in-house review of all data as well as automated and manual QC checks with the DEC River Management Program. BCE conducted its own in-house QA review after all the Phase 1 data were entered into the DMS.

2.4 PHASE 1 RESULTS

2.4.1 Reach Locations

The Winooski River watershed was divided into 129 reaches for the Phase 1 Assessment (Figure 5). Forty five of these reaches were only assessed for those parameters generated through SGAT, while a full Phase 1 assessment was conducted on the remaining 84 reaches. Pages 1 through 7 of the Appendix provides the reach locations including reach description and town where the reach is located.

2.4.2 Reference Stream Types

Reference stream types are defined as stream channel forms and processes that would exist in the absence of human-related changes to the channel, floodplain, and/or watershed. Stream and valley characteristics including valley confinement, and slope determined through remote sensing were used to determine the reference stream type. The reference reach characteristics were later refined during the windshield survey. Reference reach typing was based on both the Rosgen (1996) and the Montgomery and Buffington (1997) classification systems.

Table 3 shows the typical characteristics used to determine reference stream types (VANR, 2006a). Pages 8 through 11 of the Appendix provide a listing of reference stream types for each reach within the project area. Figure 6 shows the various stream types of the reaches within the Mid-Winooski Watershed. The majority of reaches on the main stem fall within the "C" and "E" stream type. In general, the reference "C" streams are unconfined and have moderate to gentle slopes. "E" channels have a very low width to depth ratio and flow through unconfined valleys with moderate to gentle slopes. These streams are often highly sinuous and have cohesive bank material associated with lacustrine soils. Two reaches on the main stem were of stream type B. "B" channels typically flow through confined, semi-confined or narrow valleys and have moderate to steep slopes. The two reaches on the main stem of the Winooski River with a "B" stream type have moderate to gentle slopes and flow through semi-confined valleys.

Table 3: Reference Stream Type

Stream Type	Confinement	Valley Slope	Bed Form
A	Narrowly Confined	Very steep > 6.5 %	Cascade
A	Confined	Very steep 4.0 - 6.5 %	Step-Pool
B	Confined or Semi-confined	Steep 3.0 – 4.0 %	Step-Pool
B	Confined, Semi-confined or Narrow	Moderate to Steep 2.0 – 3.0 %	Plane Bed
C or E	Unconfined (Narrow, Broad or Very Broad)	Moderate to Gentle <2.0 %	Riffle-Pool or Dune-Ripple
D	Unconfined (Narrow, Broad or Very Broad)	Moderate to Gentle <4.0 %	Braided Channel

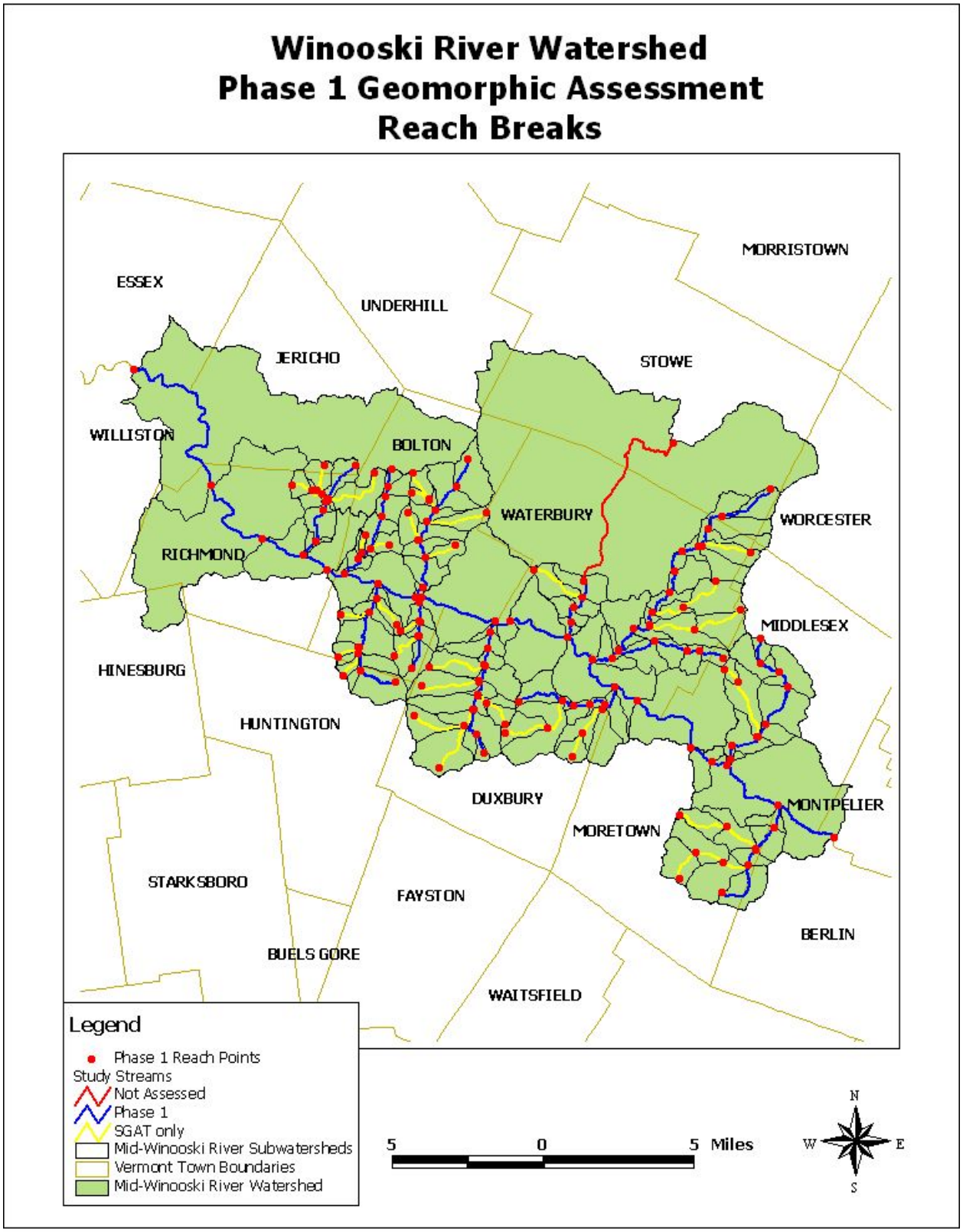

Figure 5. Reach Location Map for the Stream Geomorphic Assessment

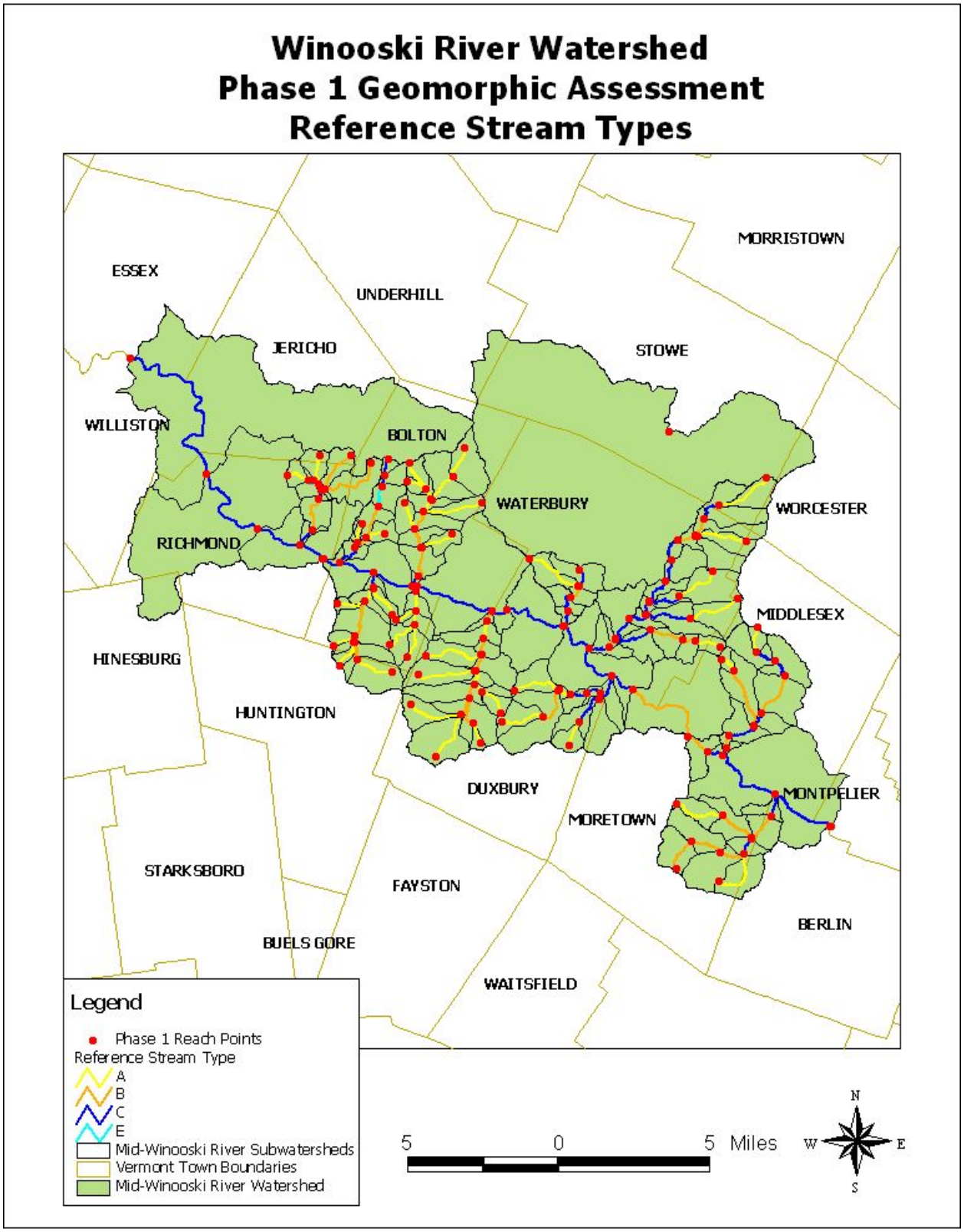

Figure 6. Reference Stream Types within the Mid-Winooski River Watershed

2.4.3 Basin Geology and Soils

The characteristics of the Winooski River watershed were determined using a combination of soils data, review of topographic maps, and information acquired during the windshield survey. Pages 12 through 21 of the Appendix, provides a summary of the basin characteristics, such as alluvial fans, grade control structures, geologic materials, and valley side slopes.

Four possible alluvial fans were noted. One was located in the upper reaches of Snipe Island Brook based on review of topography and soils maps. Three other alluvial fans were noted at the mouth of Snipe Island Brook, Preston Brook, and Joiner Brook due to abrupt changes in slope. Grade control such as bedrock ledges and dams were noted during the windshield survey and from USGS topographic maps or orthophotos. These elements act as a grade control by keeping the base elevation of a river from being lowered, and prevent the river from incising in that location. Dams on the main stem of the Winooski River include: Bolton Falls and Middlesex Dam. There is one dam on Crossett Brook at Duxbury Mill that is now inactive. On Thatcher Brook there is a dam at Colbyville. There is a breached dam on Graves Brook at the Feed Company. Other grade controls found in the watershed include eight ledge grade controls, three waterfalls, and two weirs. The waterfalls were found on Snipe Island Brook, Duck Brook and Thatcher Brook. The ledge grade controls were observed on Joiner Brook, Graves Brook, Crossett Brook, Jones Brook and on R14 of the main stem of the Winooski River. The weirs were located on Great Brook. The steepness of the valley side slopes was determined using a combination of a topographic map and the soils layer. The valley side slope steepness ranged from steep to extremely steep side slopes.

The dominant surficial geology of the Mid-Winooski River watershed consists of alluvial, glacial lake and ice-contact deposits and till. Two upstream reaches of the main stem, R14 and R15 have ice-contact deposits as the dominant surficial geology while the remaining main stem reaches have alluvial deposits as the dominant surficial geology. The subdominant surficial geology of the watershed also consists of alluvial, glacial lake and ice-contact deposits and till. With one exception, the subdominant surficial geology

in the main stem reaches is glacial lake or ice-contact deposits. In R14 the subdominant surficial geology is alluvium.

2.4.4 Land Cover – Reach Hydrology

The land use within a watershed plays an important role in the hydrology of the receiving waters. The percentage of urban and cropland development within the watershed are factors which change a watershed's response to precipitation. The most common effects of urban and cropland development is increasing peak discharges and runoff by reducing infiltration and travel time (United States Department of Agriculture 1986). The land use/land cover within the stream corridor itself is also an important parameter to evaluate. This land use/land cover plays an important role in the sediment deposition and erosion which occurs during annual flood events.

As outlined in the Phase I handbook, impact ratings were assigned for watershed land cover/land use and stream corridor land cover/land use as follow:

High – 10% or more is crop and/or urban
Low – Between 2 and 10 % is crop and/or urban
NS – Not Significant – Less than 2 % is crop and/or urban

The land cover/land use information is provided on pages 22 through 25 of the Appendix. Six of the ten reaches on the main stem of the Winooski River resulted in a watershed/land use impact rating of high and the rest were low. The dominant land cover/land use within the watershed was forest for all of the main stem reaches and the subdominant land cover/land use was either urban or crop land. For the major tributaries, those that contained reaches resulting in a high watershed/land use impact rating included: Graves Brook, Thatcher Brook, and unnamed tributaries of Thatcher Brook, Crossett Brook, and Great Brook. The remaining reaches had a watershed/land use impact rating of low or not significant. The dominant watershed land use for the major tributaries was forest. The subdominant watershed land cover/land use was urban, field or crop land.

All reaches on the main stem of the Winooski River resulted in a high impact rating for corridor land cover/use (because of agriculture or development in the corridor). The dominant corridor land cover/land use for the main stem is primarily urban and crop. For the major tributaries, the dominant land cover/land use within the river corridor was forest, urban, and crop land.

2.4.5 Historic Channel Modifications

Channel modifications may impact a stream reach by affecting the hydraulics and the sediment regime. Historic channel modifications were assessed for all reaches where a full Phase 1 assessment was performed (84 reaches in total). These reaches were assessed by evaluating flow regulations, bridge and culvert impacts, bank armoring, windrowing, straightening, and dredging. The percentage by length of reach impacted by one or more of these channel modifications was estimated and is summarized on pages 26 through 29 of the Appendix.

Flow Regulations

Impoundments potentially disrupt natural sediment transport within the reach and are flagged as possible causes of instability.

Winooski River: The following impoundments and associated reaches located on the main stem of the Winooski River were assigned an impact rating of high: Bolton Falls – R11 and Middlesex Dam – R15. All other reaches on the main stem had no known flow regulation.

Major Tributaries: On Joiner Brook, there is a snowmaking withdrawal (for Bolton Valley Resort) in reach R10.S3.04 that was assessed as having an impact rating of high. There is another impoundment on Thatcher Brook in reach R13.S1.02-S1.01 with an impact rating of low. In one of the upper reaches of Thatcher Brook, R13.S1.02-S1.10, there is a drinking water withdrawal for the town of Waterbury. According to Bill Woodruff, the water operator in Waterbury, there is no flow requirement and therefore any impact to the stream is not significant. The last flow regulation is an inactive

impoundment on Crossett Brook in reach R13.S2.02. The impact rating is low for this flow regulation.

Bridges and Culverts

As part of the Phase 1 Stream Geomorphic Assessment, the number of bridges and culverts within each reach were counted by identifying stream crossings on the topographic map and orthophotos. These stream crossings were confirmed during the windshield survey. The percentage of the reach impacted by stream crossing structures was estimated for 84 of the study reaches. Impact ratings for bridge and culverts were evaluated by determining the percentage of the reach length that is channelized, has split flow, or makes a sharp "S" bend upstream or downstream of bridges or culverts. The impact from bridge and culverts on stream dimension, pattern or profile was assigned as high for 12 of the 84 reaches (greater than 20% of the reach is impacted by bridges and culverts). Thirty-eight reaches had an impact rating of low (less than 20% of the reach is impacted by bridges and culverts).

Winooski River: Two of the reaches on the main stem (R08 and R13) of the Winooski River were assessed as having an impact rating of high for bridges and culverts. Five reaches (R07, R10, R11, R14 and R16) had an impact rating of low and the remaining three (R09, R12 and R15) were not significant.

Major Tributaries: Ten of the reaches on the major tributaries resulted in a high impact rating for bridges and culverts. These reaches were located on the following tributaries: Little River, Snipe Island Brook, Duck Brook, Preston Brook, Joiner Brook, Gleason Brook, Ridley Brook, Graves Brook and Great Brook. Thirty-two of the reaches on the major tributaries had an impact rating of low for bridges and culverts. These reaches were located on the following tributaries: Little River, Snipe Island Brook, Duck Brook, Preston Brook, Joiner Brook, Ridley Brook, Graves Brook, Thatcher Brook, Crossett Brook, Great Brook and Jones Brook.

Bank Armoring

The amount of bank armoring within a watershed is often indicative of the occurrence of channel processes, which result in bank erosion. Bank armoring, also called revetments, can be made of a variety of material including wooden cribs, gabions, logs, and rock riprap. The most common type of revetment in Vermont is rock riprap. The following criterion was used to provide an impact rating for human placed bank armoring.

H	High – Greater than 30% of the reach length is armored
L	Low – Between 10 and 30% of the reach length is armored
NS	Not Significant – Less than 10% of the reach length is armored
No Data	Bank armoring has not been evaluated for the entire reach and impact at the reach level is unknown

Rock riprap was the only type of revetment noted within the study area. Bank armoring was recorded on 32 of the 84 assessed reaches.

Winooski River: There were no reaches on the main stem of the Winooski River that had a high impact rating for bank armoring. Three reaches had an impact rating of low (R08, R10 and R13) while the remaining seven were not significant.

Major Tributaries: Five reaches were assessed as having an impact rating of high and six reaches had an impact rating of low. The rest of the reaches were assessed as not having a significant impact. The reaches with the high impact rating are located on the following tributaries: Joiner Brook, Gleason Brook, Ridley Brook, Graves Brook and Great Brook. Those with a low impact rating are located on the Little River, Snipe Island Brook, Duck Brook, Ridley Brook, Graves Brook and Jones Brook.

Channel Modifications (Windrowing and Straightening)

During the Phase 1 assessment, the total reach length (in feet) and the percentage of the reach length directly impacted by channel modification were noted for 31 of the 84

reaches. Categories considered as part of the Step 5.4 (Channel Modifications) included the following menu options:

- Straightening – Manual straightening of a channel without windrowing.
- With Windrowing – pushing gravel up from the stream bed onto the top of either bank as part of the straightening of the river.
- None – No known channel straightening.
- Not evaluated – All data sources have not been evaluated.

Channel straightening was identified by reviewing orthophotos, contacting the state river management engineer, and through field confirmation during the windshield survey. Portions of stream reaches that have been historically channelized or straightened are shown below in Figures 7 (Washington County) and 8 (Chittenden County). Twenty seven of the 84 reaches were given an impact rating of high (greater than 20% of reach has been impacted) due to channel straightening while five reaches had an impact rating of low (less than 20% of reach length impacted).

Winooski River: Channel straightening was noted on all but one of the reaches (R15) on the main stem of the Winooski River. The Winooski River has experienced extensive historic straightening primarily due to the development of highways and railroad parallel to the river. Seven of the ten main stem reaches (R08, R09, R10, R11, R12, R13 and R16) had an impact rating of high for channel straightening. Two reaches (R07 and R14) had an impact rating of low and one was not significant (R15).

Major Tributaries: Twenty reaches in the major tributaries had an impact rating of high for channel straightening. These reaches are located on the Little River, Snipe Island Brook, Preston Brook, Joiner Brook, Gleason Brook, Graves Brook, Thatcher Brook, Crossett Brook, Great Brook and Jones Brook. One reach on Duck Brook, on Snipe Island Brook, and on Jones Brook had impact ratings of low. The remaining reaches on the major tributaries had an impact of not significant.

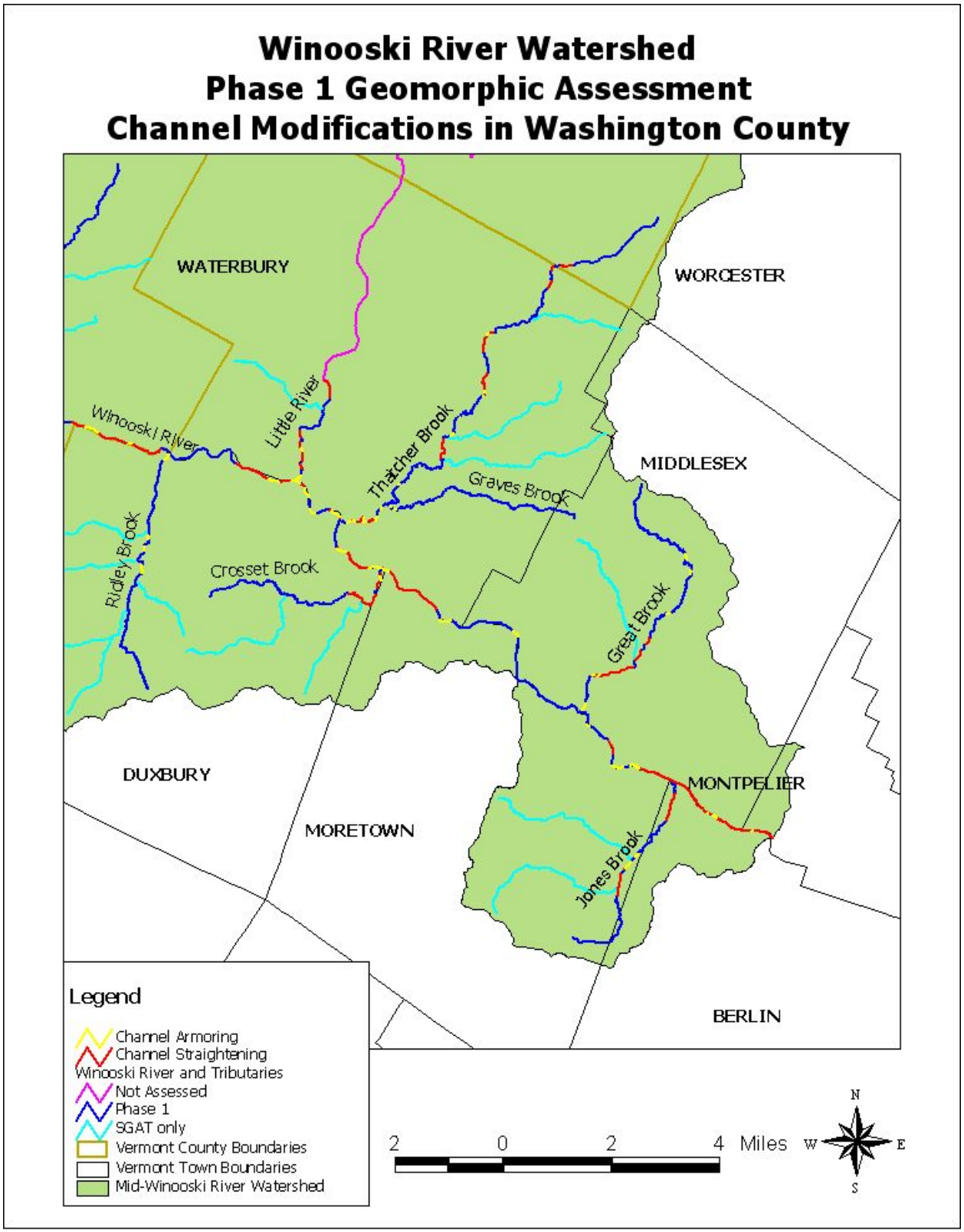

Figure 7. In-stream Channel Modifications Identified for the Mid-Winooski River Watershed in Washington County

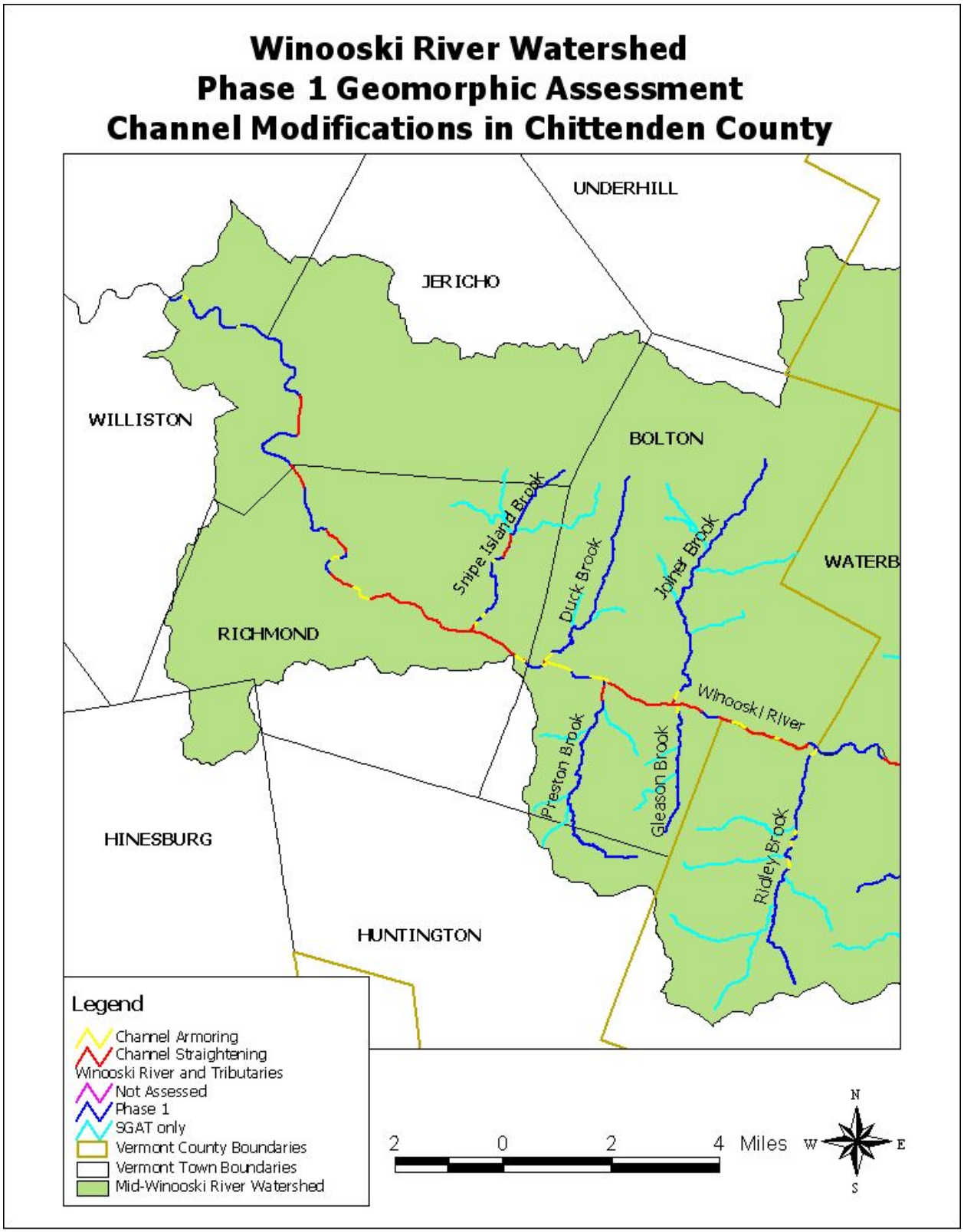

Figure 8. In-stream Channel Modifications Identified for the Mid-Winooski River Watershed in Chittenden County

Dredging History

DEC River Management Engineer Barry Cahoon reported that the Mid-Winooski River watershed had some areas where dredging, commercial mining, and/or gravel mining have occurred (personal communication 2007). Additionally, it is likely that there was some dredging associated with the channelization of many of the straightened sections.

Winooski River: Mr. Cahoon indicated that mostly downstream from the Bolton Falls Dam had experienced extensive dredging and/or gravel extraction. Reaches R07 and R09 in Richmond experienced multiple types of dredging impacts and resulted in an impact rating of high. Main stem reaches where there has been an impact rating of high for commercial mining include R10 and R16 (Bolton to Moretown). R14 (Watebury/Moretown) was assessed as having gravel mined and was assigned an impact rating of low.

Major Tributaries: In the first reach of Snipe Island Brook (R09.S1.01), gravel mining was marked on a topographic map during the windshield survey and an impact of high assigned. According to Barry Cahoon, there has been commercial mining on three reaches on Thatcher Brook with high impact. There was some gravel mining on two reaches on Jones Brook with an impact rating of low.

2.4.6 Floodplain Modifications

In this step of the Phase I assessment, careful attention is paid to infrastructure and other development which restricts access to the floodplain, resulting in vertical or lateral confinement of flood flows. The parameters included in this step are: Berms and Roads, River Corridor Development, Depositional Features, Meander Migration/Channel Avulsion, Meander Width Ratio, and Wavelength Ratio. Some of the primary factors, which may influence floodplain function for the Winooski River, are discussed below. Pages 30 through 33 of the Appendix contain the Phase I information for floodplain modifications.

Berms and Roads

An estimate of the percentage of the river corridor length along which berms, roads, railroad, or improved paths run parallel to the stream was estimated for 84 of the study reaches using information from maps, orthophotos, and the windshield survey. Reaches where berms, roads, railroads or improved paths were located along 20 percent or more of the river corridor were given impact ratings of high.

Winooski River: All reaches on the main stem of the Winooski River received an impact rating of high for berms and roads. This is primarily due to Interstate 89, Rte 2 and the railroad, which run parallel to the river throughout much of the river corridor.

Major tributaries: All tributaries except Duck Brook had reaches with impact ratings of high for berms and roads. The first reach on Duck Brook (R10.S1.01) had an impact rating of low. All reaches on the lower Little River were assessed as having impact ratings of high. A total of 30 reaches on the major tributaries (41 percent) had impact ratings of high for berms and roads. Twelve reaches had low impact ratings (5 to 20% berms, roads, railroads or improved paths within the river corridor by length), while the remaining reaches were not significant (less than 5% encroachments by length).

River Corridor Development

The river corridor development parameter looks at whether developments within the river corridor are effectively decreasing the belt width within which the river can adjust. The percentage of the reach length with houses, fill, parking lots or other development within the river corridor was tabulated using maps, orthophotos, and knowledge from the windshield survey.

Winooski River: All reaches on the main stem of the Winooski River had an impact rating of high (>20% development within the river corridor by length) for development. Historically, there has been extensive development within the Winooski River corridor resulting in the high impact ratings.

Major Tributaries: Ten reaches on the following major tributaries had impact ratings of high for river corridor development: Little River, Snipe Island Brook, Joiner Brook, Gleason Brook, Graves Brook, Thatcher Brook, Crossett Brook, Great Brook and Jones Brook. Seventeen reaches on the following major tributaries had impact ratings of low for river corridor development (5% to 20% of reach impacted): Snipe Island Brook, Duck Brook, Preston Brook, Ridley Brook, Thatcher Brook, Graves Brook, Crossett Brook, Great Brook and Jones Brook. The remaining reaches did not have significant impact ratings for corridor development.

Depositional Features

The National Agricultural Imagery Program (NAIP) orthophotos as well as results from the windshield survey were used to evaluate depositional features within the Winooski River watershed. The presence of bars (mid channel or point bars) and deltas were noted in 84 of the study reaches. The DEC has included depositional features as a component of the Phase I analysis because these features are indicative of an increased sediment load and a high likelihood that the streambed is actively aggrading and/or undergoing lateral migration. An unvegetated bar indicates the bar has recently formed or is in the process of growing.

Winooski River: Six of the ten reaches on the main stem of the Winooski River (R08, R09, R10, R11, R13 and R14) were classified as having a high impact from sediment deposition based on the large number of depositional features that were observed during the Phase 1 Assessment. All but one of these reaches was dominated by mid-channel bars. Four reaches on the main stem (R07, R12, R15 and R16) were given a low impact rating due primarily to the presence of mid-channel bars.

Major Tributaries: There were just two reaches on major tributaries that were classified as having an impact rating of high for depositional features. Point bars on R13.S1.02-S1.03 and R13.S1.02-S1.04, reaches on Thatcher Brook, resulted in high impact ratings. Four reaches (two on the Little River, one on Thatcher Brook and one on Great Brook)

were assessed as having low impact ratings due to the presence of point bars and/or mid-channel bars. Twenty four reaches were not significant and the remaining reaches were not assessed due to forest cover and the inability to observe depositional features on the aerial photos.

Meander Migration

Orthophotos were used to evaluate areas where Winooski River and its tributaries have migrated, bifurcated, or avulsed. Current NAIP digital ortho imagery from 2004 and historic orthophotos from 1978 and 1979 were compared to evaluate changes in the location of the river channel over time. The current and the historic photos span a range of approximately 25 years. In addition to the aerial photo analysis, windshield surveys helped to verify channel avulsions and islands on the main stem of Winooski River.

Winooski River: Four of the main stem reaches (R07, R08, R09 in Richmond and R12 in Waterbury) received an impact rating of high due to evidence of frequent channel migration and avulsion. This active movement of the stream channel is an indicator of significant channel adjustment. It is interesting to note that most of the reaches with a high impact are downstream of Bolton Falls Dam where most of the channel alterations have historically occurred. Four of the main stem reaches (R10, R11, R13 and R16) were assessed as having an impact rating of low for meander migration due to observations of migration and/or avulsion. The remaining two reaches (R14 and R15), located between Moretown and Waterbury, were classified as not significant.

Major tributaries: Four reaches on Thatcher Brook (R13.S1.02-S1.01, R13.S1.02-S1.03, R13.S1.02-S1.04 and R13.S1.02-S1.05) were classified with an impact rating of high due to the evidence of meander migration and/or avulsions. Ten reaches in the following tributaries were assessed as having a low impact rating: Duck Brook, Joiner Brook, Thatcher Brook, Graves Brook, Crossett Brook, Great Brook and Jones Brook. Twenty seven reaches in the major tributaries had impact ratings of not significant. The

remaining reaches were not evaluated due to forest cover and the inability to observe changes in the channel.

Meander Width and Wavelength

The 1990 series (1:5000) orthophotos in conjunction with topographic maps were used to determine the meander belt width and the meander wavelength for reference C or E riffle-pool or ripple dune stream types (i.e. unconfined systems). The topographic maps were used to determine the valley direction, while the most current orthophoto series was used to provide the accurate location of channel meanders.

The meander belt width is the horizontal distance between two opposite, outside banks on fully developed meanders. The meander width ratio is calculated by dividing the average belt width for the reach by the bankfull width. Leopold 1994 and Williams 1986 (cited in Vermont Agency of Natural Resources, 2006a) consider unconfined, gravel dominated streams with moderate to gentle gradients, which are in regime, to have belt widths in the range of 5 to 8 times the channel width.

The meander wavelength consists of two bend ways. The wavelength ratio is calculated by dividing the average wavelength by the bankfull channel width. Leopold 1994 and Williams 1986 (cited in Vermont Agency of Natural Resources, 2006a) have also shown unconfined, gravel dominated streams in shallow-sloped valleys to have wavelengths in the range of 10 to 12 times the channel width.

Winooski River: All but one of the eight unconfined reaches on the main stem of the Winooski River fell outside of the range expected for channels which are in regime. Seven of the main stem study reaches (R08, R09, R10, R11, R12, R13 and R16) were rated as high impact for meander width ratio (<3 or >10). The length of all of these reaches had been straightened by more than 50%, which resulted in a meander width ratio of 1.0. Reach R07 was rated as not significant (>5 and <8) with a meander width ratio of 6.5.

Seven of the eight unconfined reaches (R08, R09, R10, R11, R12, R13 and R16) resulted in high impact ratings for wavelength ratio. For all of these reaches, the wavelength ratio was 1.0 since each reach was more than 50% straightened by length. R07 was classified as having a not significant impact rating for wavelength ratio (>8 and <14). This reach had a wavelength ratio of 11.2.

Major Tributaries: Twenty one of the 30 unconfined reaches in all tributaries except Gleason Brook and Ridley Brook resulted with high impact ratings for meander width ratio. Four of the unconfined reaches were assessed as having an impact rating of low for meander belt width. These reaches are located in the following tributaries: Snipe Island Brook, Thatcher Brook, Graves Brook, and Crossett Brook. Five reaches (R10.S1.01, R10.S1.07, R13.S1.02-S1.04, R16.S1.06, and R16.S1.07) had impacts that were not significant. These reaches were on Duck Brook, Thatcher Brook, and Great Brook and had meander belt width values of 5.0 or greater. The higher values for meander belt width in these reaches may indicate that the streams are becoming more sinuous and are aggrading.

Twenty-two reaches within all major tributaries except for Gleason Brook and Ridley Brook resulted in impact ratings of high for wavelength ratio (<6 or >16). Five reaches on the following tributaries were assessed as having low impact ratings (>6 and <8 or >14 and <16): Little River, Snipe Island Brook, Duck Brook, Graves Brook, and Great Brook. Two reaches in the major tributaries in this study were assessed as having impacts that were not significant. These reaches were located on Snipe Island Brook and Crossett Brook.

2.4.7 Bed and Bank Windshield Survey

In order to verify data collected remotely, the Phase 1 assessment includes a field observation component known as a "windshield survey". The windshield survey involves driving or paddling streams to rapidly verify data collected in the office and flag any areas of great concern that are easily observed from the banks of the river.

Four major observations: the dominant bed form, dominant bank material, bank erosion/bank height, and debris/ ice jam potential were recorded during the windshield survey; these results are summarized in on pages 34 through 38 of the Appendix. The dominant bed form and dominant bank material were previously discussed under Section 4.2, Stream Typing. The amount of bank erosion observed along a reach and the bank height were evaluated in conjunction with each other to provide a bank erosion impact rating. Bank erosion was rated as low or high for all of the reaches on the main stem of the Winooski River. For the major tributaries, six reaches, located in Joiner Brook and Great Brook, were rated with high impact ratings. Twenty one reaches in all major tributaries except Duck Brook and Gleason Brook had low impact ratings for erosion. The locations of bank erosion are illustrated in Figures 9 and 10.

Debris/Ice Jam Potential

Undersized culverts or bridges with spans less than the average channel width were the primary factors identified as potential for ice and debris jams. These structures, which are likely to cause constrictions during high flow events may result in lateral erosion or channel avulsions or may even endanger infrastructure. Four of the main stem reaches, located primarily in Richmond, (R08, R09, R10 and R11) received an impact rating of high for debris/ice jam potential. High impact ratings are assigned when existing jams are causing erosion and stream migration near infrastructure or there is a recorded history of jams and flooding impacts. Five of the main stem reaches (R07, R13, R14, R15 and R16) had a low impact rating (channel dimensions, pattern and profile indicate jams are possible). On the Snipe Island Brook, Ridley Brook and Great Brook, there were three reaches with high impact ratings due to debris, undersized road crossings or multiple causes for debris/ice-jam potential. Twenty six reaches on the all major tributaries in this study except Preston Brook and the Little River were classified as having impact ratings of low.

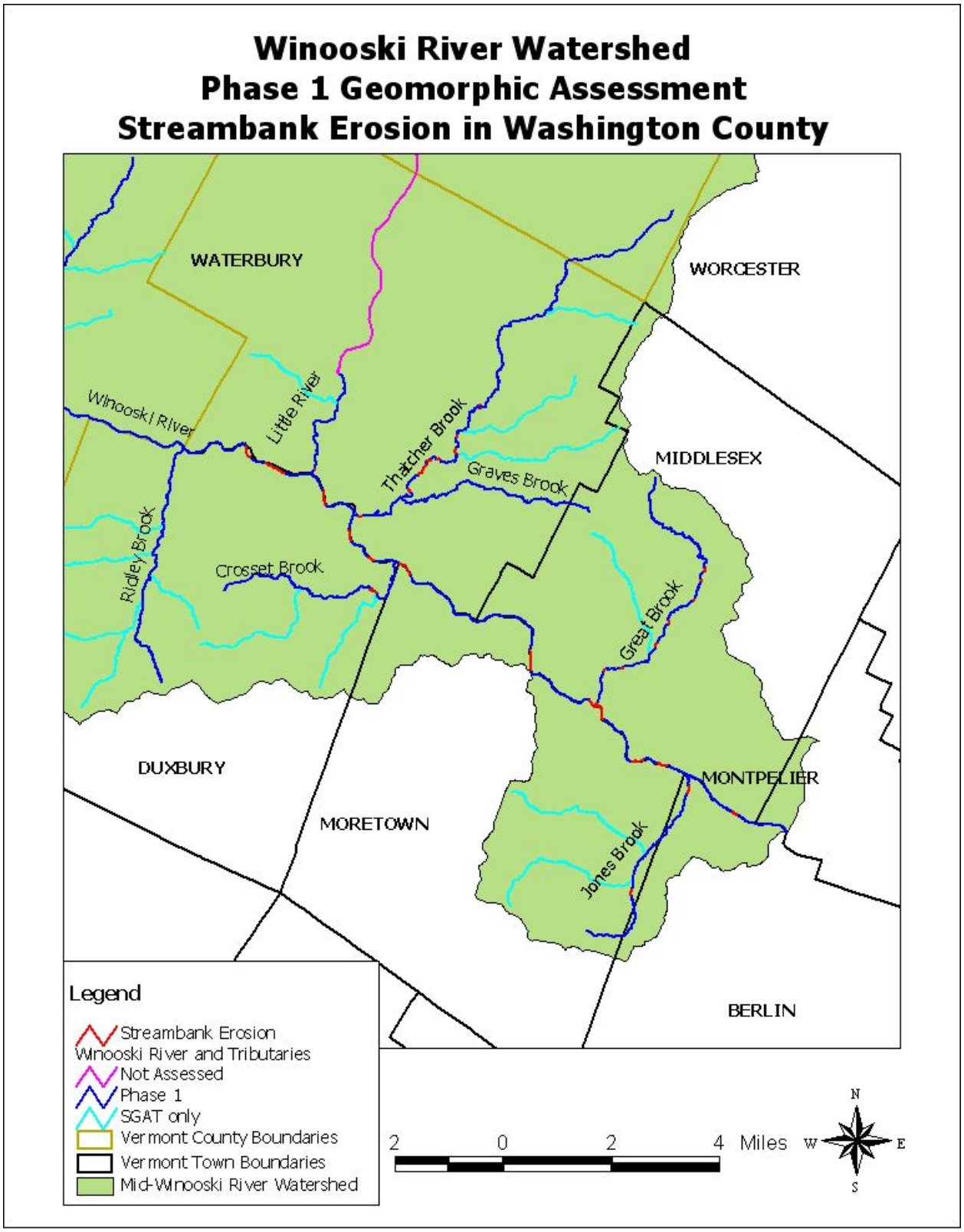

Figure 9: Streambank Erosion in the Mid-Winooski River Watershed in Washington County

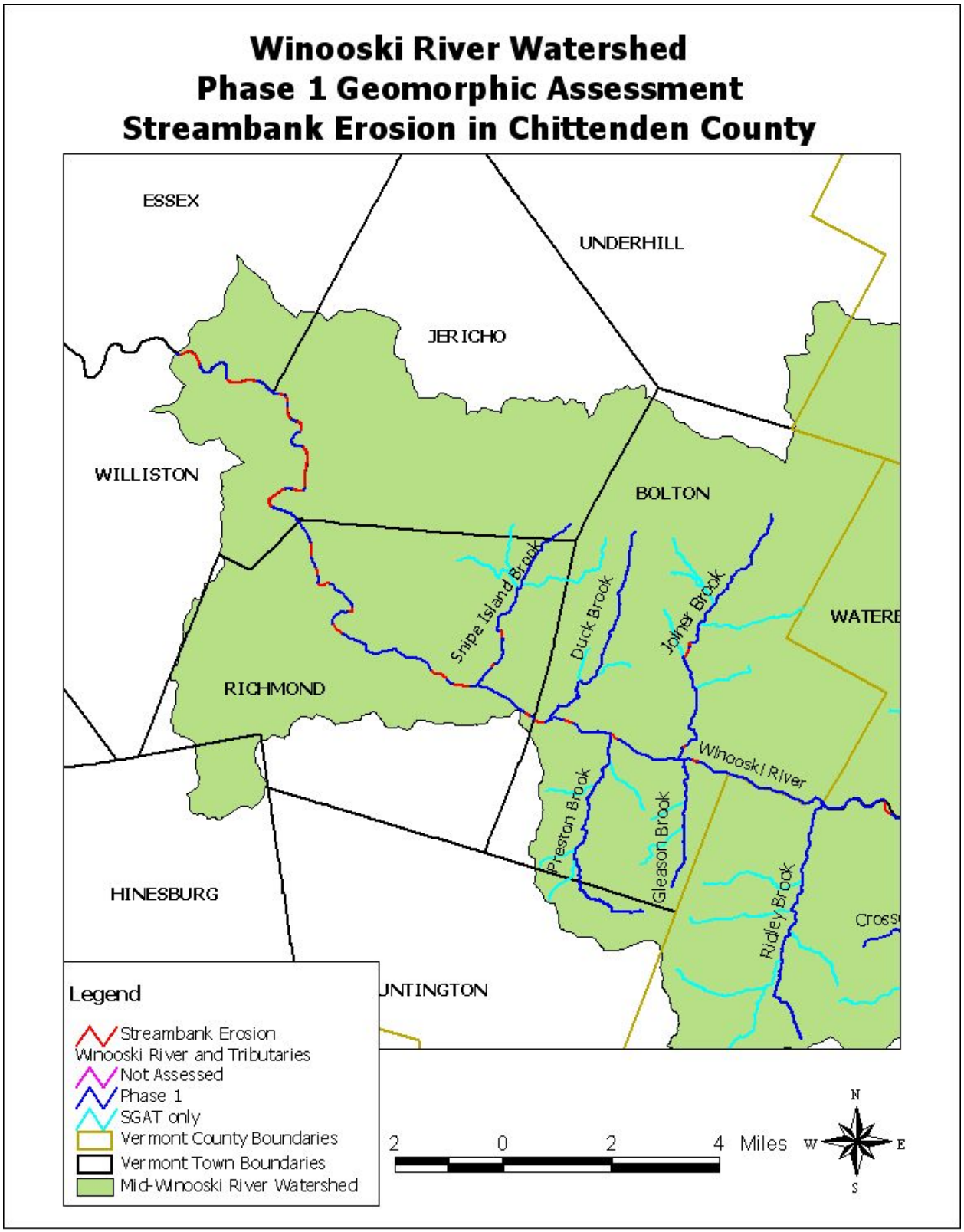

Figure 10: Streambank Erosion in the Mid-Winooski River Watershed in Chittenden County

2.5 PHASE 1 DATA ANALYSIS

2.5.1 Phase 1 Impact Scores

The impact scores for each Phase 1 step and total scores are reported on pages 39 through 41 of the Appendix. The Phase 1 evaluates parameters that may cause channel adjustment. These parameters are grouped into four major categories: land use, in-stream modifications, floodplain modifications, and bed and bank windshield survey. Reach summary reports of these four categories are provided on pages 42 through 46 of the Appendix Adjustment scores, reach condition, and reach sensitivity for all reaches are provided on pages 47 through 51 of the Appendix.

Winooski River: For each parameter, the maximum impact score for the main stem is 20 (10 reaches times impact score of 2). As shown below in Figure 11, the corridor land use, berms and roads and river corridor development received the highest impact ratings for the watershed. The parameters channel modifications, watershed land use, depositional features, belt width, average wavelength, bank erosion and debris jam potential also resulted in high scores.

The total impact scores (out of 32 possible) for the Phase I assessment of the main stem of the Winooski River are summarized below in Figure 12. Reach R08 had the highest total impact rating of 25. The following reaches resulted in a Phase 1 reach condition of poor: R07, R08, R09, R11 and R13 (Figures 13 and 14). These reaches have undergone significant channel and floodplain modifications which may have resulted in a change in planform, profile, and dimension such that the stream is no longer in balance with the flow and sediment regime of its watershed.

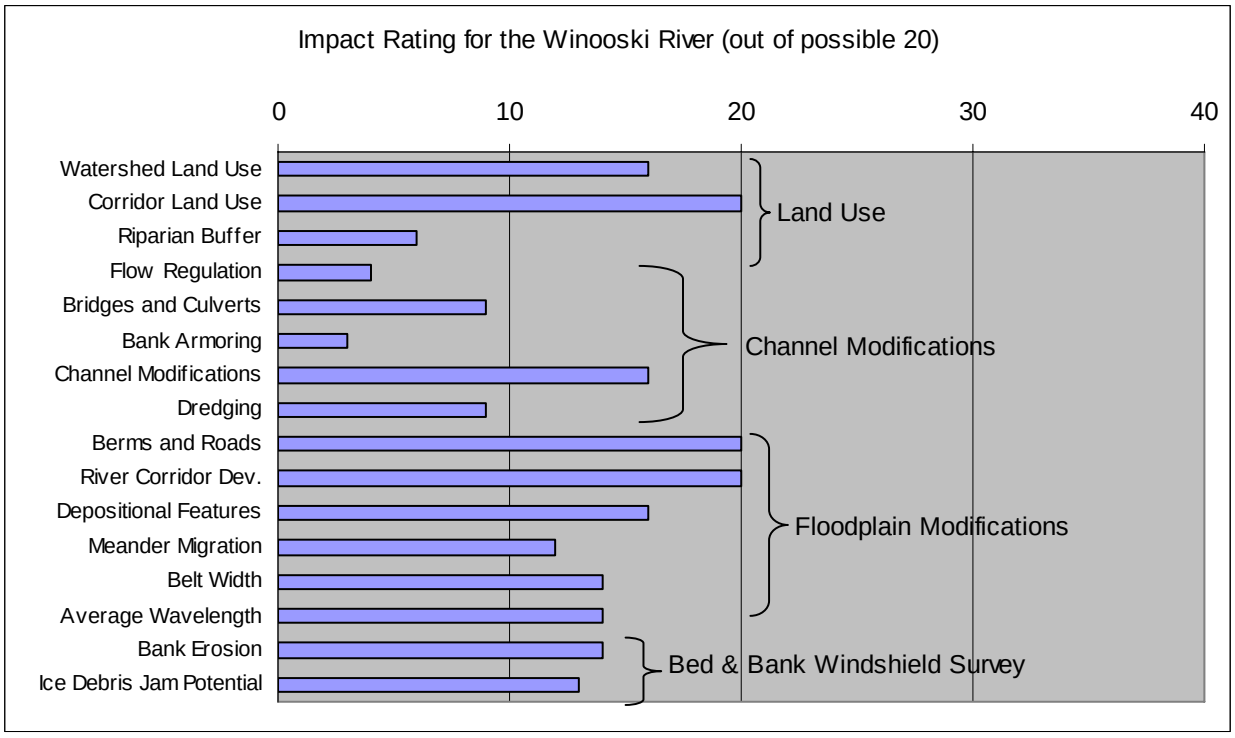

Figure 11: Impact Rating for Winooski River Watershed by Parameter and Category

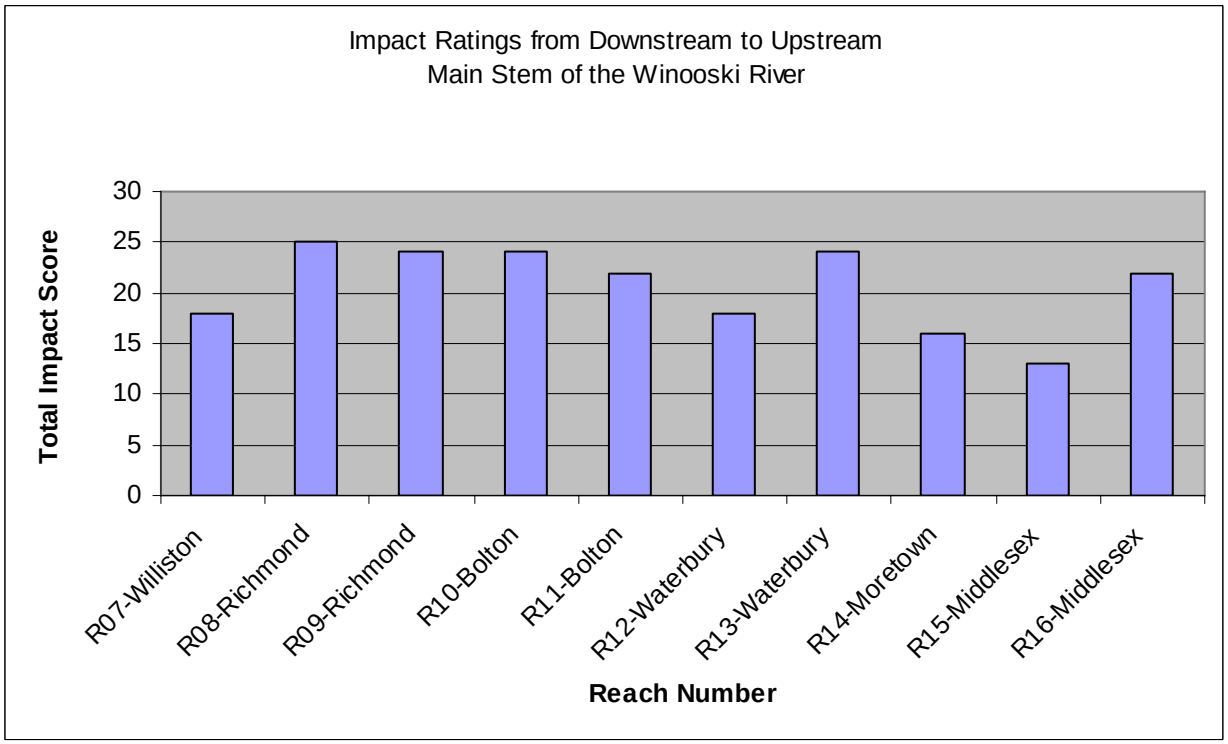

Figure 12: Impact Ratings (out of 32) from downstream to upstream on the main stem of Winooski River

Streams in fair condition are likely in adjustment and experiencing major and rapid changes due to recent floodplain and channel modifications, land cover changes, and/or loss of riparian buffer. Reaches R10, R12, R14, R15 and R16 fell into this category (Figures 13 and 14).

Reaches in good condition are thought to have experienced some degree of human-induced change to their watershed, floodplain and/or channel and are likely to be undergoing only minor adjustments. A reference reach has no significant channel or floodplain modifications and has a forested buffer, adjacent to the channel. In other words, these reaches are close to the natural condition. There were no reaches on the main stem of the Winooski River in good or reference condition.

Major Tributaries: For each parameter, the maximum impact score for the major tributaries is 148 (74 reaches times impact score of 2). As shown below in Figure 15, the corridor land use and watershed land use received the highest impact ratings. The parameters bridges and culverts, berms and roads, channel modifications, meander belt width, and average meander wavelength also resulted in high scores.

Reach condition in the major tributaries was variable (Figures 13 and 14). Tributaries containing reaches in poor condition included: Joiner Brook and Great Brook. All tributaries except Crossett Brook had reaches resulting in fair condition, with the fair condition occurring in the reaches closest to the mouth in Snipe Island Brook, Duck Brook, Ridley Brook, and Gleason Brook. The remaining reaches in the major tributaries were either in good or reference condition.

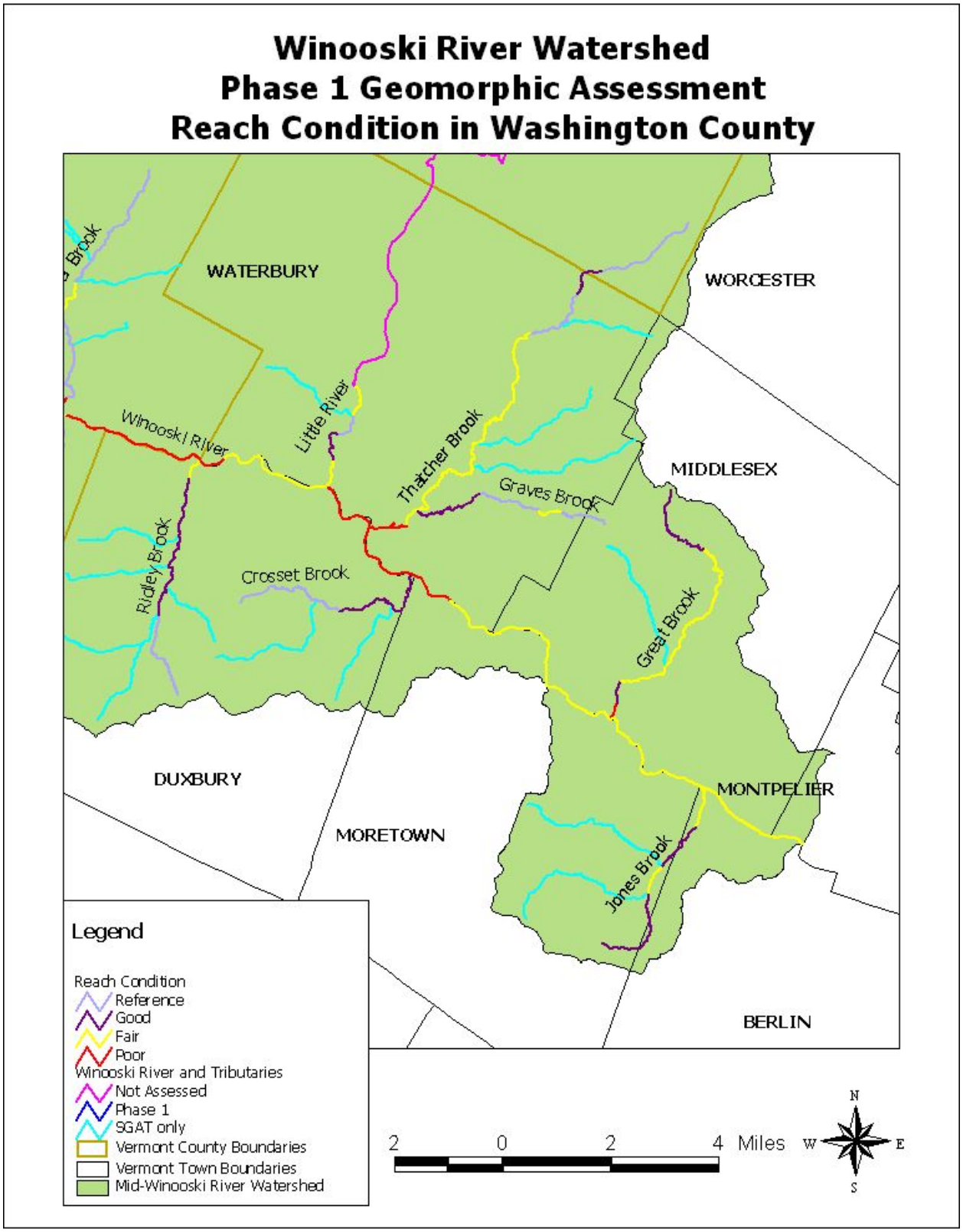

Figure 13: Reach Condition in the Mid-Winooski River Watershed in Washington County

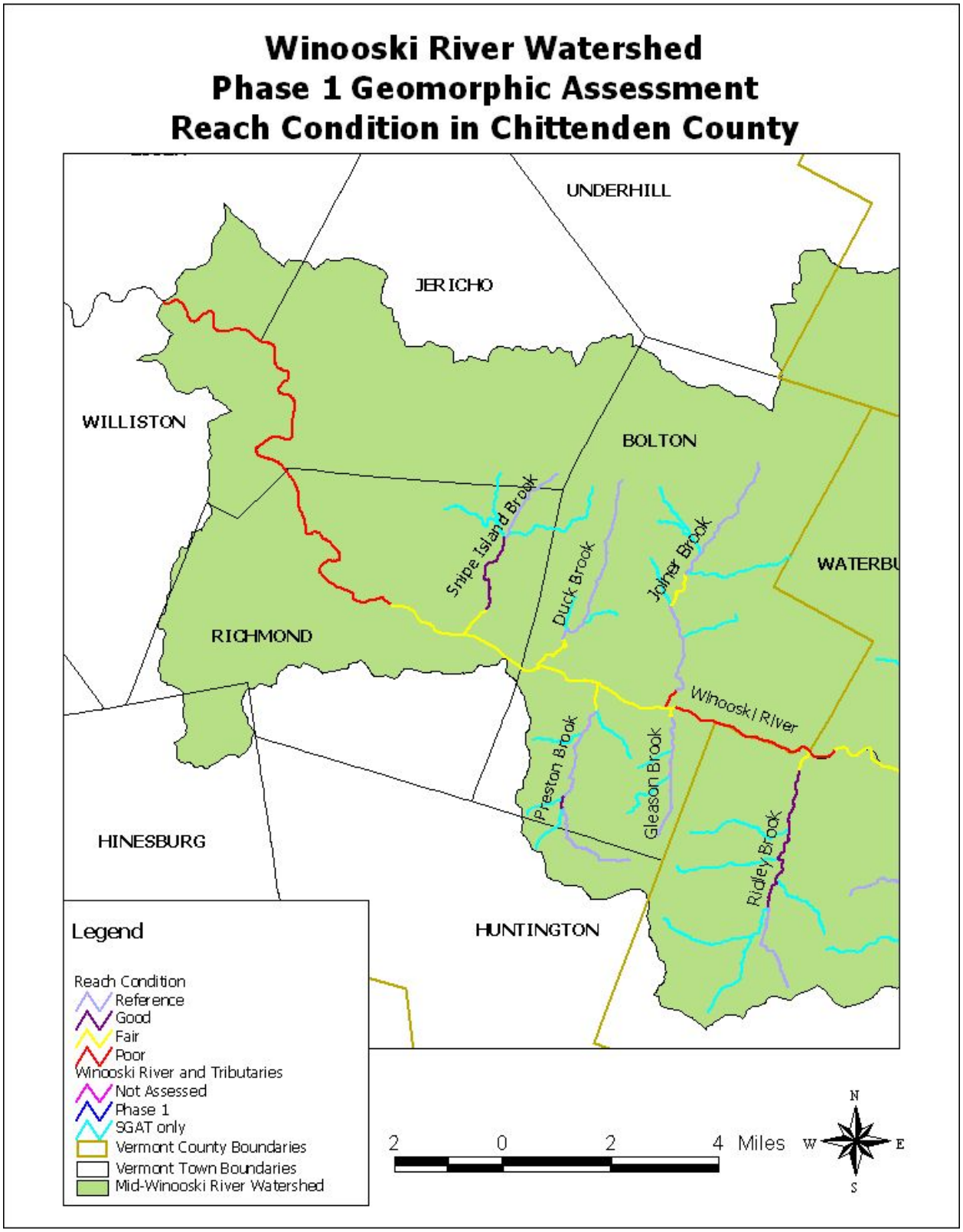

Figure 14: Reach Condition in the Mid-Winooski River Watershed in Chittenden County

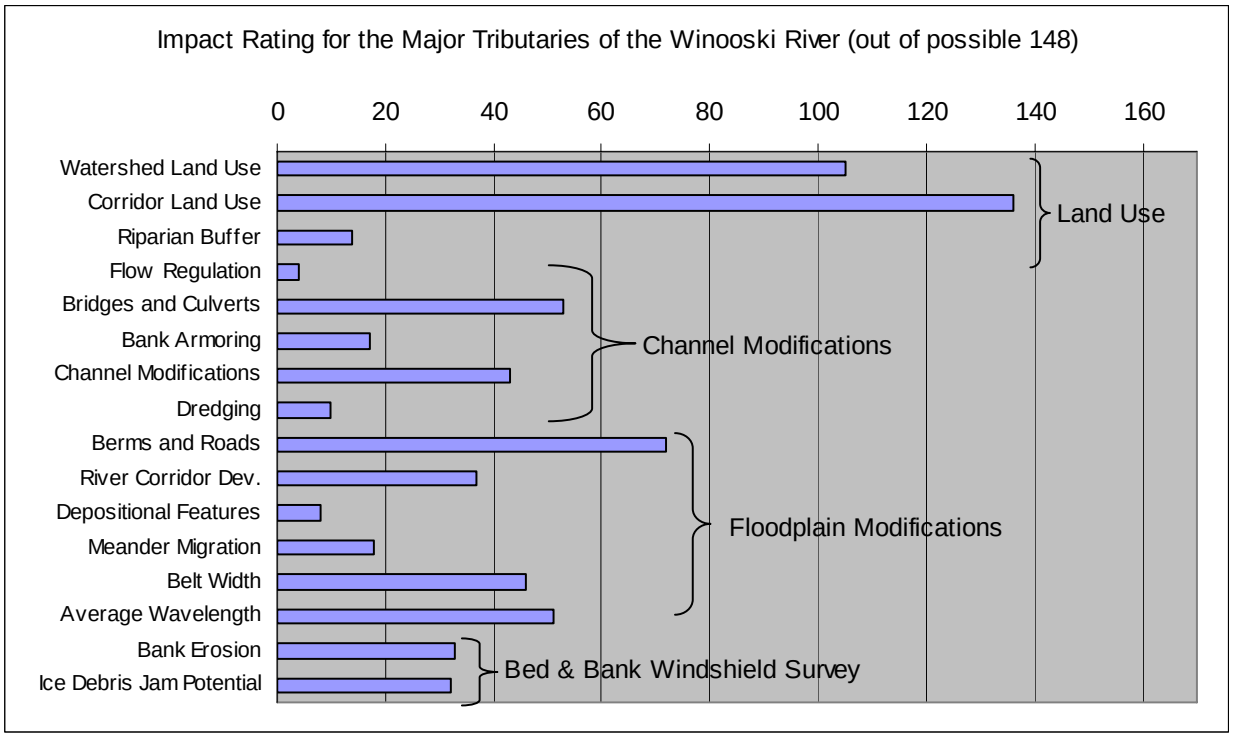

Figure 15: Impact Rating for Major Tributaries of the Winooski River Watershed by Parameter and Category

2.5.2 Phase 1 Adjustment Processes

The Phase 1 data suggest that most of the stream reaches are experiencing more than one type of channel adjustment process.

Based on the Phase 1 data, degradation, aggradation and planform adjustment were identified as the primary adjustment processes in the main stem reaches of the Winooski River. For the major tributaries within the Mid-Winooski watershed, degradation, aggradation and planform adjustment were identified as the primary adjustment processes.

2.5.3 Phase 1 Reach Sensitivity

The stream sensitivity is automated in the DMS based on the existing stream type and condition of each reach. Highly sensitive reaches are more likely to be in adjustment, and are very sensitive to land use changes within the watershed.

Winooski River: Eight of the ten main stem reaches resulted in a high sensitivity rating. These reaches had valleys that were narrow to very broad. Two reaches located between Moretown and Middlesex (R14 and R15) were classified as having a moderate reach sensitivity. The reaches at the upper end of the study area are semi-confined and have a stream type that is less sensitive to change.

Major Tributaries: Twenty eight reaches within the major tributaries were assigned a high reach sensitivity. These reaches were located on the following major tributaries: Little River, Snipe Island Brook, Duck Brook, Preston Brook, Ridley Brook, Graves Brook, Thatcher Brook, Crossett Brook, Great Brook, and Jones Brook. Twenty three reaches located on all tributaries except for Preston Brook had a reach sensitivity of moderate. Very low reach sensitivities were recorded for 23 reaches on all major tributaries except for the Little River.

3.0 CONCLUSIONS AND RECOMMENDATIONS

The Phase 1 Geomorphic Assessment of Winooski River indicated that land use and floodplain modification have been the greatest contributors to instability in the stream system. The majority of the reaches on the main stem of the stream are actively undergoing a process of major geomorphic adjustment. These adjustments will likely continue to cause streambank erosion that is evidence of planform migration. As these processes unfold, habitat in Winooski River may continue to be impacted. There has been significant encroachment into the floodplain of the Winooski River that at this point is difficult to change due to major highway and railway infrastructure. However, wherever possible long term protection and restoration of the riparian corridor may help to improve habitat, water quality, and stream stability and to reduce the impact from such extensive floodplain encroachment.

The Phase 1 data generated through this study will allow for a prioritization of reaches where Phase 2 Geomorphic Assessments should be conducted. Phase 2 data will provide information to pinpoint those areas where stream restoration would most benefit the Winooski River. The following are recommendations for the Winooski River.

1. Use the results from this Phase 1 Geomorphic Assessment to prioritize reaches for Phase 2 Geomorphic Assessments. Conduct Phase 2 Geomorphic Assessments on these reaches and identify potential areas for river corridor restoration. Due to the high level of observed impact and reach condition all of the main stem reaches are recommended for a Phase 2 assessment (Table 4). For the following major tributaries, the most downstream reaches have been recommended for Phase 2 assessment: Little River, Snipe Island Brook, Duck Brook, Preston Brook, Gleason Brook, and Ridley Brook. The lowest reach on Joiner Brook and a reach further upstream that was found to be in fair condition have also been recommended for Phase 2. The mouth of Graves Brook to the Thatcher Brook confluence and then one other reach in fair condition located three miles upstream of confluence are included on Table 4. The first six miles of Thatcher Brook, the first five miles of Great Brook, and the first two and a half miles of Jones Brook have been recommended for Phase 2 assessments. The tributary reaches recommended for Phase 2 assessments were primarily in fair or poor condition and are located at the lower end of the watershed.

Table 4: Phase 2 Recommendations

Stream Name	Reach Numbers	River Miles	Description
Winooski River	R07 to R16	36	Alder Brook to Gateway Park
Snipe Island Brook	R09.S1.01	0.6	Mouth to change in confinement
Duck Brook	R10.S1.01	1	Mouth to waterfall
Preston Brook	R10.S2.01	0.5	Mouth to first unnamed tributary
Joiner Brook	R10.S3.01	0.4	Mouth to change in confinement
Joiner Brook	R10.S3.04	0.8	In between tributary confluences
Gleason Brook	R10.S4.01	0.2	Mouth to change in confinement

Table 4: Phase 2 Recommendations			
Stream Name	**Reach Numbers**	**River Miles**	**Description**
Ridley Brook	R11.S1.01	0.5	Mouth to change in confinement
Little River	M2.01-M2.04	2.5	Mouth to Waterbury Reservoir
Graves Brook	R13.S1.01 to R13.S1.02	1.3	Mouth to Thatcher Brook
Thatcher Brook	R13.S1.02-S1.01 to R13.S1.02-S1.06	5.8	Mouth to unnamed tributary
Great Brook	R16.S1.01 to R16.S1.06	4.9	Mouth to Middlesex Center
Jones Brook	R16.S2.01 to R16.S2.03	2.6	Mouth to Kelley Brook

2. Develop and implement a River Corridor Management Plan through community outreach and meetings with landowners with the coordination of local watershed groups. The implementation of a River Corridor Management Plan goes a long way towards reducing fluvial erosion hazards and minimizing land use conflicts. The River Corridor Management Plan would also provide some structure for identifying river restoration and corridor protection project types and effective approaches.

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Appendix
Mid-Winooski River
Phase 1 DMS Reports

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
M02.01		Little River	Waterbury	This reach begins at the confluence with the Winooski River in Waterbury and continues upstream for approximately 2800 ft, to a point where the valley walls increase the channel confinement.
M02.02		Little River	Waterbury	This reach begins approximately 2800 feet upstream from the confluence with the Winooski River and continues upstream for approximately 3400 feet to where the river makes a major bend to the east.
M02.03		Little River	Waterbury	side of Woodward Mtn. The upstream end of the reach is approximately 3900 feet downstream of the Waterbu Reservoir dam.
M02.04		Little River	Waterbury	This reach begins approximately 3900 feet downstream of the Waterbury reservoir dam and continues upstream to the foot of the dam.
M02.05	Yes	Little River	Stowe, Waterbury	
R07		Winooski River	Jericho, Richmond,	(2 miles from the five corners intersection). The reach ends at the Route 89 and Route 2 bridges near the Richmo Interstate exit.
R08		Winooski River	Richmond	Interstate exit 11. The reach passes through Richmond village and continues upstream for just under a mile above the Bridge St. bridge.
R09		Winooski River	Richmond	The downstream end of the reach is located approximately 8/10's of a mile upstream of Bridge St. in Richmond. The upstream end of the reach is at the mouth of the Huntington River in Jonesville.
R09.S1.01		Snipe Island Brook	Richmond	This reach begins at the confluence with the Winooski River east of Jonesville and continues upstream to where t valley confinement changes approximately 1500 feet up Snipe Ireland Road,
R09.S1.02		Snipe Island Brook	Richmond	Downstream end of reach is approximately 1500 feet up Snipe Ireland Road. Upstream end of reach is 6900 feet upstream near a cluster of buildings.
R09.S1.03		Snipe Island Brook	Richmond	Reach begins approximately 1600 feet downstream of the confluence of Snipe Island Brook with a brook coming from Richmond Pond to the northwest.
R09.S1.03-S1.01		Unnamed Tributary	Richmond	From the confluence with Snipe Island Brook this reach continues upstream for about 2700 feet to the outlet Richmond Pond.
R09.S1.03-S1.01-S1.01		Unnamed Tributary	Jericho, Richmond	This reach begins approximately 1200 feet downstream of Richmond Pond and runs due north towards the terminus of Snipe Ireland Road.
R09.S1.03-S1.02		Unnamed Tributary	Richmond	This reach includes Richmond Pond and the wetlands immediately upstream and downstream of it.
R09.S1.03-S1.03		Unnamed Tributary	Richmond	This reach begins upstream of Richmond Pond and continues uphill to the east to notch in the ridge south Huckleberry Hill.
R09.S1.04		Snipe Island Brook	Richmond	Reach begins at confluence of tribs about 2 miles up Snipe Ireland road where there is a flat open bench. Reach goes upstream 500 feet until the confluence of a trib on the left bank.
R09.S1.04-S1.01		Unnamed Tributary	Bolton, Richmond	Reach begins as a trib that enter Snipe Island Brook about 2 miles up Snipe Ireland Road. Flows northwest eventually crossing the Bolton town line, under Stage Road and through Preston Pond.
R09.S1.05		Snipe Island Brook	Jericho, Richmond	Reach begins approximately 2 miles up Snipe Ireland Road. Reach heads north north east eventually crossing Jericho town line and ending near 900 feet elevation contour.
R10		Winooski River	Bolton, Richmond	Reach begins at the confluence of the Huntington River in Jonesville and continues upstream to the confluence with Gleanson Brook (just upstream of Joiner Brook confluence) in Bolton.

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
R10.S1.01		Duck Brook	Bolton	Reach begins at the confluence with the Winooski River (about 1500 feet east on Route 2 from the Jonesville Bridge) and ends at 500 ft. elevation just under a mile upstream.
R10.S1.02		Duck Brook	Bolton	Reach is a short steep section about 1 mile up from the confluence with the Winooski. Starts at 500 ft. elevation, ends 700 ft. elevation where a trib enters on the right bank.
R10.S1.02-S1.01		Unnamed Tributary	Bolton	Begins at 700 ft elevation where Duck Brook makes a sharp bend.
R10.S1.03		Duck Brook	Bolton	Begins at 700 ft., elevation where a trib enters on the right bank and continues upstream to where another trib enters on the left bank at a point which is approximately 1 mile up the Bolton Notch Road.
R10.S1.03-S1.01		Unnamed Tributary	Bolton	Begins to the west of the Notch Road about 1 mile up from route 2. Continues under the Notch Road at about 1.2 mi in an easterly direction towards Stimson Mtn.
R10.S1.04		Duck Brook	Bolton	Begins to the west of the Notch Rd. about 1 mile up from Route 2 where a trib enters on the east bank. Ends at the ou of a wetland complex about 2.5 miles up the Notch Road.
R10.S1.05		Duck Brook	Bolton	This reach is a wetland complex, The downstream end of the reach is west of the Notch Road about 2.5 miles up from Route 2, the top of the reach is about 3.0 miles up.
R10.S1.06		Duck Brook	Bolton	Begins to the west of the Notch Road about 3 miles up from Route 2 at the upstream end of a wetland complex a continues for several hundred feet through a narrow valley.
R10.S1.07		Duck Brook	Bolton	Begins to the west of the Notch Road about 3.5 miles up from Route 2 and continues to a pond at the top of Bolton Notch that marks the source of Duck Brook.
R10.S2.01		Preston Brook	Bolton	Begins at the confluence with the Winooski River (about 2 miles upstream from the Jonesville Bridge) and continues upstream to the confluence of a tributary which is east of Honey Hollow Road about 1/4 miles up the road..
R10.S2.01-S1.01		Unnamed Tributary	Bolton	Begins to the east of Honey Hollow Road about 1/4 miles up from the junction with Duxbury Road.
R10.S2.02		Preston Brook	Bolton	Begins to the east of the Honey Hollow Road about 1/4 mile up and continues upstream to a point east of 3/4 mile up the road where a trib enters on the left bank.
R10.S2.02-S1.01		Unnamed Tributary	Bolton	Begins at the confluence with Preston Brook east of 3/4 miles up Honey Hollow Road. Continues upstream under HH Road up the flanks of Robbins Mtn.
R10.S2.03		Preston Brook	Bolton	Begins about 3/4 mile up Honey Hollow Road and continues up to the confluence of a tributary just upstream fron bridge near the end of Honey Hollow Road.
R10.S2.03-S1.01		Unnamed Tributary	Bolton	Begins near the end of Honey Hollow Road and continues upstream towards the ridgeline to the west..
R10.S2.04		Preston Brook	Bolton	Begins near the end of Honey Hollow Road and continues upstream to a tributary which enters on the left bank near 1150 ft. elevation.
R10.S2.04-S1.01		Unnamed Tributary	Bolton, Huntington	Begins upstream from the end of Honey Hollow Road near 1150 feet elevation and ascends the tributary to the ridgel towards the west.
R10.S2.05		Preston Brook	Bolton, Huntington	Begins at approximately 1150 ft elevation near the end of the Honey Hollow Road and continues upstream to 1400 feet elevation.
R10.S2.06		Preston Brook	Huntington	Flows from about 1400 feet elevation up the western flanks of Camels Hump.

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
R10.S3.01		Joiner Brook	Bolton	Begins at the confluence with the Winooski River (near the Bolton Access Rd, off Route 2) and continues upstream tc point about 0.2 tenths of a mile up the access road.
R10.S3.02		Joiner Brook	Bolton	Begins to the east of the Bolton Access Road about .2 miles from the junction with Route 2 and continue upstream to confluence with a trib on the east bank about 1.3 miles up the access road.
R10.S3.02-S1.01		Unnamed Tributary	Bolton	Begins at the confluence wtih Joiner Brook to the east of the Bolton Access Road (at mile 1.3) and continues up the western flank of Bone Mtn.
R10.S3.03		Joiner Brook	Bolton	Begins to the east of the Bolton Access Rd, (at mile 1.3) and continues upstream to where a trib enters on the right ba near Access Road mile 1.8
R10.S3.03-S1.01		Unnamed Tributary	Bolton	Begins at the confluence with Joiner Brook near Access Road mile 1.8 and continues upstream, under the access road up towards the ridgeline.
R10.S3.04		Joiner Brook	Bolton	Begins to the east of the Access Road (mile 1.8) and continues upstream to the confluence of a trib entering on the left bank near Access road mile 2.5
R10.S3.04-S1.01		Unnamed Tributary	Bolton, Waterbury	Begins at the confluence with Joiner Brook east of the Access Road (mile 2.5) and continues upstream up the weste flank of Bone Mtn.
R10.S3.05		Joiner Brook	Bolton	Begins to the east of the Bolton Access Road (mile 2.5) at the confluence with a trib on the left bank and continues upstream crossing under the access rd. to a point west of the access road (mile 3) where a trib joins on the right bank.
R10.S3.05-S1.01		Unnamed Tributary	Bolton	Begins to the west of the Access Road (mile 3) at the confluence with Joiner Brook and continues upstream passing near the Bolton Lodge (access road) to the confluence with a trib that enters on the right bank.
R10.S3.05-S1.01-S1.01		Unnamed Tributary	Bolton	Begins upstream of the Bolton lodge (on the Long Trail).
R10.S3.05-S1.02		Unnamed Tributary	Bolton	Begins upstream of Bolton lodge (on the Long Trail) and continues up the eastern flank of the mountain,
R10.S3.06		Joiner Brook	Bolton	Begins at a point west of about 3 miles up the Bolton Access Road and continues up Joiner Brook to a point west of the end of the Access Road.
R10.S3.07		Joiner Brook	Bolton	Begins near the end of the Bolton Access Road and continues upstream toward the summit Bolton Mountain.
R10.S4.01		Gleason Brook	Bolton	Beings at the confluence with the Winooski River (across from the Bolton Access Road) and continues upstream to where the channel slope changes near the end of Boulder Wood Lane.
R10.S4.02		Gleason Brook	Bolton	From the end of the Boulder Wood Lane the reach conttinues upstream paralleling the Long Trail to the confluence of a trib on the left bank just upstream from Wiley :Lodge.
R10.S4.02-S1.01		Unnamed Tributary	Bolton	Begins just upstream from the Wiley Lodge (on the Long Trail) and continues upstream to the ridgeline west of Gleas Brook.
R10.S4.03		Gleason Brook	Bolton	From just upstream of the Wiley Lodge (Long Trail) continues upstream to near 1200 elevation where a trib enters on left bank.
R10.S4.03-S1.01		Unnamed Tributary	Bolton	From the confluence with Gleason Brook upstream.
R10.S4.04		Gleason Brook	Bolton	From about 1400 ft elevation upstream to the headwaters of Gleanson Brook.

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
R11		Winooski River	Duxbury, Waterbury	Begins just upstream from the confluence of Gleason and Joiner Brooks in Bolton (near the Bolton Access Road) and continues upstream to Bolton Falls.
R11.S1.01		Ridley Brook	Duxbury	Begins at the confluence with the Winooski River near the base of the Camel's Hump Road in Duxbury and continues upstream to a point east of mile 0.3 on the Camels Hump Rd. .
R11.S1.02		Ridley Brook	Duxbury	From mile 0.3 on the Camel's Hump Road the reach continues upstream until about 0.9 road mile
R11.S1.03		Ridley Brook	Duxbury	Begins near mile 0.9 on the Camels Hump Road and ends where a trib enters on the left bank about 1200 ft upstream the Marshall Road.
R11.S1.03-S1.01		Unnamed Tributary	Duxbury	Begins about 1200 feet upstream of Marshall Road at the confluence with Ridley Brook and continues upstream up the east side of Camel's Hump.
R11.S1.04		Ridley Brook	Duxbury	Begins about 1200 feet upstream of the Marshall Road and ends where a tributary enters on the left bank about (miles up from the Marshall Rd. / Camel's Hump Rd. intersection.
R11.S1.04-S1.01		Unnamed Tributary	Duxbury	Begins at the confluence with the Ridley Brook about 0.9 miles up from the Marshall Rd. / Camel's Hump Rd. intersection and continues up the eastern flank of Camel's Hump Mtn.
R11.S1.05		Ridley Brook	Duxbury	Begins about 1000 feet downstream from the Scrabble Hill/Camel's Hump Road intersection and continues upstream to where a trib enters on the right bank 0.3 miles up the Hump Road/ Scrabble Hill intersection.
R11.S1.05-S1.01		Unnamed Tributary	Duxbury	Reach begins about 0.3 miles past the Scrabble Hill intersection off the Camel's Hump Road and continues upstrea crossing under Vilcins road to a point about 1200 feet upstream from that crossing.
R11.S1.05-S1.02		Unnamed Tributary	Duxbury	Begins about 1200 feet upstream of the Vilcins Road crossing and continues east up the western slope of Crossett Hill.
R11.S1.06		Ridley Brook	Duxbury	Reach begins about 0.3 miles uphill from the Scrabble Hill Road and Camel's Hump Road intersection and continues upstream to the confluence of a trib on the right bank near the Dunkee School.
R11.S1.06-S1.01		Unnamed Tributary	Duxbury	Begins at the confluence with the Ridley Brook near the Dunkee school and continues upstream to where a tributa enters on the left bank near 1400 feet.
R11.S1.06-S1.01-S1.01		Unnamed Tributary	Duxbury	Begins near 1400 feet elevation and ascends up the eastern slope of the Camels Hump Mtn,
R11.S1.06-S1.02		Unnamed Tributary	Duxbury	Begins near 1400 foot elevation contour and continues south upstream towards Beaver Meadows.
R11.S1.07		Ridley Brook	Duxbury	Begins at the Dunkee School of Camels Hump Road and ends at 1500 feet elevation.
R11.S1.08		Ridley Brook	Duxbury	Begins at 1500 feet elevation and continues upstream
R12		Winooski River	Duxbury, Waterbury	Begins at Bolton Falls and continues upstream to the mouth of the Little River in Waterbury.
R13		Winooski River	Moretown, Waterbury	Begins at the mouth of the Little River in Waterbury and continues upstream through Waterbury to a place 0.7 mil upstream of the junction of route 2 and 100 south.
R13.S1.01		Graves Brook	Waterbury	Begins at the confluence with the Winooski River in Waterbury and continues upstream to just past the Interstate north exit ramp off Stowe Street.

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
R13.S1.02		Graves Brook	Waterbury	From just upstream of the I-89 north off ramp to the confluence with Thatcher Brook near the Lincoln St. and Perry Hill Road intersection.
R13.S1.02-S1.01		Thatcher Brook	Waterbury	From the confluence with Graves Brook upstream to Guptil Road.
R13.S1.02-S1.02		Thatcher Brook	Waterbury	From Guptil Road upstream to the confluence with a tributary that enters on the left bank at a point east of 0.6 miles up Guptil Road.
R13.S1.02-S1.02-S1.01		Unnamed Tributary	Waterbury	From the confluence with the Thatcher Brook (east of mile 0.6 on Guptil Road) upstream to a point south of 1200 feet Kneeland Flats Road from the Shaw Mansion Road junction.
R13.S1.02-S1.02-S1.02		Unnamed Tributary	Middlesex, Waterbury	From a point 1200 ft up Kneeland Flats Road junction with Shaw Mansion Road the reach continues upstream towar the summit of Densmore Mtn.
R13.S1.02-S1.03		Thatcher Brook	Waterbury	From a point east of 0.6 miles up Guptil Road upstream to the confluence of a trib on the left bank 850 upstream on Guptil Road from the Kneeland Flats Rd intersection.
R13.S1.02-S1.03-S1.01		Unnamed Tributary	Waterbury	Begins at the confluence with the Thatcher Brook (850 ft up Guptil Road from the Guptil/Kneeland Flats Road intersection). Continues upstream to a point just south of where Harvey Farm Road ends.
R13.S1.02-S1.03-S1.02		Unnamed Tributary	Waterbury	From a point just south of where Harvey Farm Road ends upstream to the top of Loomis Hill.
R13.S1.02-S1.04		Thatcher Brook	Waterbury	From a point 850 ft upstream from the Guptil/ Kneeland Flats juction this reach continues upstream to about 1000 feet below the Loomis Hill Road crossing.
R13.S1.02-S1.05		Thatcher Brook	Waterbury	From about 1000 ft. below the Loomis Hill Road crossing this reach continues upstream to a point east of Maple St. ~2500 ft up from the Maple St.- Loomis Hill intersection.
R13.S1.02-S1.06		Thatcher Brook	Waterbury	Reach begins at a point ~2500 ft upstream from the Maple/Loomis Hill St intersection and ends about 500 upstrea from Mtn. View Drive.
R13.S1.02-S1.07		Thatcher Brook	Waterbury	Reach begins about 500 upstream from Mtn. view Drive and Maple St. intersection and continues to where a tributary enters the brook on the left bank near 950 feet elevation.
R13.S1.02-S1.07-S1.01		Unnamed Tributary	Waterbury	Begins at the confluence with the Thatcher Brook near 950 feet elevation and continues for 500 feet upstream.
R13.S1.02-S1.07-S1.02		Unnamed Tributary	Middlesex, Waterbury	Begins near the Thatcher Brook confluence and continues upstream crossing under Sweets Rd on its way up tl western side of White Rock Mtn.
R13.S1.02-S1.08		Thatcher Brook	Waterbury	Begins near the 950 foot elevation contour and continues upstream to the 1100 ft elevation contour.
R13.S1.02-S1.09		Thatcher Brook	Stowe, Waterbury	From the 1100 ft elevation contour reach continues upstream to the Waterworks Rd crossing.
R13.S1.02-S1.10		Thatcher Brook	Stowe	From the Waterworks Rd. crossing on Thatcher Brook reach continues upstream to Hogback Mtn.
R13.S1.03		Graves Brook	Waterbury	From the confluence with Thatcher Brook just upstream of the Stowe St. crossing upstream to a place just south of the end of Country Club Road.
R13.S1.04		Graves Brook	Waterbury	From a place just south of the end of Country Club Road upstream to just below the Perry Hill Road crossing.

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
R13.S1.05		Graves Brook	Waterbury	From just below the Perry Hill Road crossing to a place just south of the Middlesex Notch road about 1000 feet up f Notch road from the junction with Perry Hill Road.
R13.S1.06		Graves Brook	Middlesex, Waterbury	From a place 1000 feet up the Middlesex Notch Road (From the junction with Perry Hill Road) upstream to near the top of Chases Mtn.
R13.S2.01		Crossett Brook	Moretown, Waterbury	From the confluence of the Winooski River (near the Route 2/100 bridge in downtown Waterbury) upstream to where a tributary enters the brook on the right bank near the Crossett Brook Middle School.
R13.S2.01-S1.01		Unnamed Tributary	Duxbury	From its confluence with the Crossett Brook near the Crossett Brook Middle School upstream about 1000 feet.
R13.S2.01-S1.02		Unnamed Tributary	Duxbury	From a place 1000 feet upstream from the confluence with the Crossett Brook, upstream to just below the Philips Sch (just downstream of the southern Crossett Hill Road and Route 100 intersection.
R13.S2.01-S1.03		Unnamed Tributary	Duxbury	From just below the Philips School (north of the southern Crossett Hill Road and Route 100 intersection) to the wetlands just north of the Stevens Brook Road and Route 100 intersection.
R13.S2.02		Crossett Brook	Duxbury	From just south of the Crossett Brook Middle School upstream to just below the Morse Road and Crossett Hill Ro intersection.
R13.S2.03		Crossett Brook	Duxbury	From just below the Morse Road and Crossett Hill Road intersection upstream 0.5 miles on the Crossett Hill Road.
R13.S2.04		Crossett Brook	Duxbury	intersection, upstream to where a tributary enters on the right bank near the Richardson Rd and Crossett Hill Road intersection.
R13.S2.04-S1.01		Unnamed Tributary	Duxbury	From the Richardson Rd and Crossett Hill Rd intersection upstream to just above the Hayes Rd and Crossett Hill F intersection.
R13.S2.04-S1.02		Unnamed Tributary	Duxbury	From just upstream of the Hayes Rd and Crossett Hill Rd intersection up the eastern slope of Crossett Hill.
R13.S2.05		Crossett Brook	Duxbury	From a point near the Richardson Rd and Crossett Hill Rd intersection upstream up the eastern slope of Crossett Hill.
R14		Winooski River	Moretown, Waterbury	From a place 0.8 miles upstream from the confluence of the Crossett Brook upstream to the confluence of the M River.
R15		Winooski River	Middlesex, Moretown	From the confluence of the Mad River upstream to the dam in Middlesex.
R16		Winooski River	Middlesex, Montpelier,	From the dam in Middlesex upstream to the confluence with the Dog River in Montpelier.
R16.S1.01		Great Brook	Middlesex	From the confluence with the Winooski River 0.5 miles upstream of the Middlesex dam to where the slope of the chan steepens 700 feet upstream of the I-89 bridge.
R16.S1.02		Great Brook	Middlesex	From where the slope of the channel steepens 700 feet upstream from the I-89 bridge upstream to the crossing on Old Brook Rd.
R16.S1.03		Great Brook	Middlesex	From the Old Brook Rd crossing upstream to the place where a tributary enters on the right bank 0.7 miles up Brook Rd from its downstream intersection with Center Road.
R16.S1.03-S1.01		Unnamed Tributary	Middlesex	From a place (the confluence with Great Brook) 0.7 miles up the Brook Road from its junction with the center ro upstream to about 1100 feet elevation.

Phase 1 - Step 1. Reach Locations

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Reach ID	Excluded?	Stream Name	Towns	Description
R16.S1.03-S1.02		Unnamed Tributary	Middlesex	From the 1100 foot contour upstream towards Chases Mtn.
R16.S1.04		Great Brook	Middlesex	From a place off the Brook Road (0.7 miles from the southern intersection with the Center Road) upstream to a place about 1.1 miles upstream of the same intersection.
R16.S1.05		Great Brook	Middlesex	From a place about 1.1 miles upstream of the southern Brook Rd. and Center Rd. intersection upstream to a place (miles downstream from the northern Brook Rd. and Center Rd. intersection.
R16.S1.06		Great Brook	Middlesex	From a place 0.3 miles downstream of the northern Brook Rd and Center Rd intersection upstream to a place due west of the Center Road and South Bear Swamp Rd intersection.
R16.S1.07		Great Brook	Middlesex	From a place due west of the South Bear Swamp and Center Rd intersection upstream to just below the Daniels Farm Rd crossing.
R16.S1.08		Great Brook	Middlesex	From just below the Daniels Farm Rd. crossing upstream to where TH15 junctions with South Bear Swamp Rd.
R16.S2.01		Jones Brook	Berlin	From its confluence with the Winooski River (just north of the intersection of Jones Brook Rd and Three Mile Bridge Road) upstream to where the stream becomes more confined 0.5 miles up the Jones Brook Rd.
R16.S2.02		Jones Brook	Berlin, Moretown	From a place just east of 0.5 miles up the Jones Brook Rd. upstream to where Kelley Brook enters on the left bank at Ward Brook and Jones Brook Rd intersection.
R16.S2.02-S1.01		Kelley Brook	Moretown	From the Ward Brook Rd and Jones Brook Rd intersection upstream to a place near the 1.2 mile mark on Ward Bro Rd.
R16.S2.02-S1.02		Kelley Brook	Moretown	From a place 1.2 miles up Ward Brook Rd. upstream to the headwaters on the east slope of the Northfield Mtns.
R16.S2.03		Jones Brook	Moretown	From near the Jones Brook Rd and Ward Brook Rd intersection upstream to where Herring Brook enters on the left ba near the junction of Jones Brook Rd and Herring Brook Rd.
R16.S2.03-S1.01		Herring Brook	Moretown	From the junction of Herring Brook Rd and the Jones Brook Rd upstream to just below the Herring Lynch Trail Rd.
R16.S2.03-S1.02		Herring Brook	Moretown	From just downstream of the Herring Lynch Trail crossing upstream to the junction of Kelly Brook Rd and Herring Brook Rd.
R16.S2.03-S1.03		Herring Brook	Moretown	From the junction of Kelley Brook Rd and Herring Brook Rd upstream to the headwaters.
R16.S2.04		Jones Brook	Berlin, Moretown	From the junction of the Herring Brook Rd and Jones Brook Rd upstream to the headwaters on the eastern slope Chase Mtn.
T1.01		Unnamed Tributary	Waterbury	From the confluence with the Little River approximately 2 miles up the Little River Rd upstream to the headwaters.

Phase 1 - Step 2. Preliminary Reference Stream Type

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.1		2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.1		2.11	
	Elevation		Valley	Valley	Channel	Channel		Watershed	Channel	Valley	Confinement		Reference	
	Up	Down	Length	Slope	Length	Slope	Sinuosity	Area	Width	Width	Ratio	Type	Stream	Bedform
Reach ID	(ft.)	(ft.)	(ft.)	(%)	(ft.)	(%)		(sq. mi.)	(ft.)	(ft.)			Type	
M02.01	395	390	2708	0.18	3009	0.17	1.11	112.04	104.5	674	6.5	BD	C	Riffle-Pool
M02.02	415	395	3238	0.62	3747	0.53	1.16	111.79	104.4	686	6.6	BD	C	Riffle-Pool
M02.03	430	415			2922	0.51		111.16	104.1			NC	B	Plane Bed
M02.04	445	430	3035	0.49	3350	0.45	1.1	109.74	103.5	701	6.8	BD	C	Riffle-Pool
R07	292	270	28225	0.08	37805	0.06	1.34	992.67	272.8	3214	11.8	VB	C	Riffle-Pool
R08	295	292	14619	0.02	18756	0.02	1.28	961.48	269	3022	11.2	VB	C	Riffle-Pool
R09	318	295	13103	0.18	13355	0.17	1.02	944.2	266.9	2136	8	BD	C	Riffle-Pool
R09.S1.01	320	308	3270	0.37	3433	0.35	1.05	5.38	27.5	709	25.8	VB	C	Riffle-Pool
R09.S1.02	550	320	6596	3.49	6936	3.32	1.05	5.11	26.8	50	1.9	NC	B	Step-Pool
R09.S1.03	570	550	1636	1.22	1883	1.06	1.15	4.21	24.7	142	5.8	NW	C	Riffle-Pool
R09.S1.03-S1.01	630	570	2428	2.47	2612	2.3	1.08	1.64	16.3	235	14.4	VB	C	Riffle-Pool
R09.S1.03-S1.01-S1.01	1018	590	4939	8.67	5611	7.63	1.14	0.72	11.3			NC	A	Cascade
R09.S1.03-S1.02	645	630	1255	1.2	2278	0.66	1.82	0.86	12.2	1935	158.1	VB	E	Riffle-Pool
R09.S1.03-S1.03	938	645	4002	7.32	4290	6.83	1.07	0.46	9.3			NC	A	Cascade
R09.S1.04	578	570	591	1.35	699	1.14	1.18	2.49	19.6	232	11.9	VB	C	Riffle-Pool
R09.S1.04-S1.01	1238	580	11812	5.57	12758	5.16	1.08	1.6	16.1			SC	B	Step-Pool
R09.S1.05	895	578	7887	4.02	8682	3.65	1.1	0.83	12.1			SC	B	Step-Pool
R10	330	318	18121	0.07	18195	0.07	1	867.47	257.1	1331	5.2	NW	C	Riffle-Pool
R10.S1.01	500	317	4175	4.38	5049	3.62	1.21	3.45	22.6	300	13.3	VB	C	Riffle-Pool
R10.S1.02	720	500	1188	18.52	1200	18.33	1.01	3.03	21.3			NC	A	Cascade
R10.S1.02-S1.01	1240	730	3434	14.85	3554	14.35	1.03	0.13	5.4			NC	A	Cascade
R10.S1.03	810	720	2087	4.31	2191	4.11	1.05	2.81	20.6			SC	B	Step-Pool
R10.S1.03-S1.01	1380	810	3717	15.33	3965	14.38	1.07	0.56	10.2			NC	A	Cascade
R10.S1.04	1040	810	6078	3.78	6284	3.66	1.03	2.16	18.4			SC	B	Step-Pool
R10.S1.05	1110	1040	3519	1.99	4156	1.68	1.18	1.43	15.3	509	33.2	VB	E	Riffle-Pool
R10.S1.06	1150	1110	1185	3.38	1939	2.06	1.64	0.7	11.2			NW	C	Riffle-Pool
R10.S1.07	1198	1150	3116	1.54	3339	1.44	1.07	0.24	7	141	20.3	VB	C	Riffle-Pool
R10.S2.01	400	310	2768	3.25	2822	3.19	1.02	6.38	29.6	535	18.1	VB	C	Riffle-Pool
R10.S2.01-S1.01	1820	400	6124	23.19	6224	22.81	1.02	0.46	9.3			NC	A	Cascade
R10.S2.02	600	400	2824	7.08	2966	6.74	1.05	5.69	28.1			NC	A	Cascade
R10.S2.02-S1.01	1590	590	5700	17.54	5847	17.1	1.03	0.28	7.5			NC	A	Cascade
R10.S2.03	1018	600	6836	6.11	7596	5.5	1.11	4.9	26.4			SC	B	Step-Pool
R10.S2.03-S1.01	1920	1020	4176	21.55	4496	20.02	1.08	0.35	8.2			NC	A	Cascade
R10.S2.04	1135	1018	1171	9.99	1333	8.78	1.14	2.82	20.7			SC	A	Cascade

Phase 1 - Step 2. Preliminary Reference Stream Type

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.1		2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.1		2.11	
	Elevation		Valley	Valley	Channel	Channel		Watershed	Channel	Valley	Confinement		Reference	
	Up	Down	Length	Slope	Length	Slope	Sinuosity	Area	Width	Width	Ratio	Type	Stream	Bedform
Reach ID	(ft.)	(ft.)	(ft.)	(%)	(ft.)	(%)		(sq. mi.)	(ft.)	(ft.)			Type	
R10.S2.04-S1.01	1890	1145	5000	14.9	5313	14.02	1.06	0.28	7.5			NC	A	Cascade
R10.S2.05	1380	1135	3175	7.72	3733	6.56	1.18	2.35	19.1			SC	B	Step-Pool
R10.S2.06	2400	1380	7000	14.57	7329	13.92	1.05	1.57	16			NC	A	Cascade
R10.S3.01	400	330	2204	3.18	2323	3.01	1.05	9.28	34.9	687	19.7	VB	C	Riffle-Pool
R10.S3.02	795	400	6000	6.58	6297	6.27	1.05	9.16	34.7			SC	B	Step-Pool
R10.S3.02-S1.01	2200	795	6500	21.62	6595	21.3	1.01	0.62	10.6			NC	A	Cascade
R10.S3.03	970	795	3500	5	3673	4.76	1.05	7.53	31.8			SC	B	Step-Pool
R10.S3.03-S1.01	1665	970	5100	13.63	5257	13.22	1.03	0.68	11.1			NC	A	Cascade
R10.S3.04	1150	970	3850	4.68	4069	4.42	1.06	6.22	29.3			SC	B	Step-Pool
R10.S3.04-S1.01	2800	1150	11450	14.41	11502	14.35	1	0.88	12.4			NC	A	Cascade
R10.S3.05	1390	1150	2545	9.43	2744	8.75	1.08	4.63	25.7			NC	A	Cascade
R10.S3.05-S1.01	1630	1390	2250	10.67	2308	10.4	1.03	0.85	12.2			NC	A	Cascade
R10.S3.05-S1.01-S1.01	2062	1630	4000	10.8	4061	10.64	1.02	0.25	7.1			NC	A	Cascade
R10.S3.05-S1.02	2420	1630	5900	13.39	6015	13.13	1.02	0.48	9.5			NC	A	Cascade
R10.S3.06	1945	1390	5575	9.96	6263	8.86	1.12	3.19	21.8			NC	A	Cascade
R10.S3.07	2700	1945	5700	13.25	5750	13.13	1.01	1.72	16.6			NC	A	Cascade
R10.S4.01	400	335	785	8.28	975	6.67	1.24	2.62	20	599	29.9	VB	B	Step-Pool
R10.S4.02	885	400	3600	13.47	3687	13.15	1.02	2.59	19.9			NC	A	Cascade
R10.S4.02-S1.01	1982	890	3900	28	3989	27.38	1.02	0.16	5.9			NC	A	Cascade
R10.S4.03	1160	885	2600	10.58	2641	10.41	1.02	1.97	17.7			NC	A	Cascade
R10.S4.03-S1.01	1982	1160	6900	11.91	7112	11.56	1.03	0.75	11.5			NC	A	Cascade
R10.S4.04	2450	1160	6350	20.31	6407	20.13	1.01	0.75	11.5			NC	A	Cascade
R11	370	330	17458	0.23	17592	0.23	1.01	841.99	253.8	1145	4.5	NW	C	Riffle-Pool
R11.S1.01	400	335	2004	3.24	2377	2.73	1.19	12.89	40.3			SC	B	Plane Bed
R11.S1.02	580	400	3000	6	3089	5.83	1.03	12.66	40			NC	A	Step-Pool
R11.S1.03	720	580	3000	4.67	3098	4.52	1.03	11.7	38.7			SC	B	Step-Pool
R11.S1.03-S1.01	2500	730	11000	16.09	11416	15.5	1.04	1.14	13.9			NC	A	Cascade
R11.S1.04	880	720	3142	5.09	3467	4.61	1.1	10.18	36.4			SC	B	Step-Pool
R11.S1.04-S1.01	2580	880	11200	15.18	11251	15.11	1	1.49	15.6			NC	A	Cascade
R11.S1.05	1050	880	3000	5.67	3074	5.53	1.02	7.65	32.1			NC	A	Step-Pool
R11.S1.05-S1.01	1280	1035	2300	10.65	2378	10.3	1.03	0.82	12			NC	A	Cascade
R11.S1.05-S1.02	2140	1280	5750	14.96	5805	14.81	1.01	0.5	9.7			NC	A	Cascade
R11.S1.06	1200	1050	2607	5.75	2839	5.28	1.09	6.52	29.9			SC	B	Step-Pool
R11.S1.06-S1.01	1400	1200	3400	5.88	4091	4.89	1.2	3.7	23.3			SC	B	Step-Pool

Phase 1 - Step 2. Preliminary Reference Stream Type

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.1		2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.1		2.11	
	Elevation		Valley	Valley	Channel	Channel		Watershed	Channel	Valley	Confinement		Reference	
	Up	Down	Length	Slope	Length	Slope	Sinuosity	Area	Width	Width	Ratio	Type	Stream	Bedform
Reach ID	(ft.)	(ft.)	(ft.)	(%)	(ft.)	(%)		(sq. mi.)	(ft.)	(ft.)			Type	
R11.S1.06-S1.01-S1.01	2920	1395	9900	15.4	10017	15.22	1.01	1.09	13.6			NC	A	Cascade
R11.S1.06-S1.02	2640	1400	9800	12.65	9918	12.5	1.01	2.16	18.4			NC	A	Cascade
R11.S1.07	1520	1200	5400	5.93	5903	5.42	1.09	1.48	15.6			SC	B	Step-Pool
R11.S1.08	2140	1520	3650	16.99	3761	16.48	1.03	0.25	7.1			NC	A	Cascade
R12	390	370	11399	0.18	12157	0.16	1.07	820.37	250.9	1146	4.6	NW	C	Riffle-Pool
R13	410	390	17315	0.12	20271	0.1	1.17	703.84	234.5	1974	8.4	BD	C	Riffle-Pool
R13.S1.01	435	395	3734	1.07	4792	0.83	1.28	19.04	47.9	706	14.7	VB	C	Riffle-Pool
R13.S1.02	502	435	1987	3.37	2173	3.08	1.09	18.25	47			SC	B	Step-Pool
R13.S1.02-S1.01	578	502	4710	1.61	6605	1.15	1.4	15.32	43.5	430	9.9	BD	C	Riffle-Pool
R13.S1.02-S1.02	595	578	3284	0.52	4611	0.37	1.4	13.53	41.2	937	22.7	VB	C	Riffle-Pool
R13.S1.02-S1.02-S1.01	838	595	7986	3.04	9628	2.52	1.21	2.81	20.6			NW	C	Riffle-Pool
R13.S1.02-S1.02-S1.02	2260	838	10200	13.94	10411	13.66	1.02	1.42	15.3			NC	A	Cascade
R13.S1.02-S1.03	615	595	2738	0.73	3706	0.54	1.35	10.32	36.6	713	19.5	VB	C	Riffle-Pool
R13.S1.02-S1.03-S1.01	775	610	6150	2.68	7003	2.36	1.14	2.25	18.7			NW	C	Riffle-Pool
R13.S1.02-S1.03-S1.02	1338	775	8700	6.47	8843	6.37	1.02	1.81	17			NC	A	Step-Pool
R13.S1.02-S1.04	670	615	4870	1.13	6408	0.86	1.32	7.88	32.5	813	25	VB	C	Riffle-Pool
R13.S1.02-S1.05	720	670	3913	1.28	4469	1.12	1.14	7.29	31.4	872	27.8	VB	C	Riffle-Pool
R13.S1.02-S1.06	830	720	4157	2.65	4808	2.29	1.16	6.21	29.3	670	22.9	VB	C	Riffle-Pool
R13.S1.02-S1.07	950	830	3266	3.67	3704	3.24	1.13	5.96	28.7			SC	B	Step-Pool
R13.S1.02-S1.07-S1.01	978	950	480	5.83	495	5.66	1.03	1.84	17.1			NC	A	Step-Pool
R13.S1.02-S1.07-S1.02	2550	978	9200	17.09	9333	16.84	1.01	0.86	12.3			NC	A	Cascade
R13.S1.02-S1.08	1095	950	4100	3.54	4206	3.45	1.03	3.81	23.6			SC	B	Step-Pool
R13.S1.02-S1.09	1210	1095	4180	2.75	4529	2.54	1.08	2.83	20.7			NW	C	Riffle-Pool
R13.S1.02-S1.10	3080	1210	10500	17.81	10629	17.59	1.01	1.02	13.2			NC	A	Cascade
R13.S1.03	650	502	6962	2.13	8725	1.7	1.25	2.72	20.3	502	24.7	VB	C	Riffle-Pool
R13.S1.04	930	650	6250	4.48	6351	4.41	1.02	1.68	16.5			SC	B	Step-Pool
R13.S1.05	1080	930	2573	5.83	2899	5.17	1.13	1	13.1			NW	B	Step-Pool
R13.S1.06	1920	1080	4758	17.65	4858	17.29	1.02	0.47	9.4			NC	A	Cascade
R13.S2.01	450	410	4056	0.99	5509	0.73	1.36	8.68	33.9	936	27.6	VB	C	Riffle-Pool
R13.S2.01-S1.01	470	458	1067	1.12	1250	0.96	1.17	2.79	20.6	372	18.1	VB	C	Riffle-Pool
R13.S2.01-S1.02	690	470	6041	3.64	7151	3.08	1.18	1.54	15.9	878	55.4	VB	C	Riffle-Pool
R13.S2.01-S1.03	970	690	4452	6.29	4889	5.73	1.1	0.67	11			NC	A	Step-Pool
R13.S2.02	565	450	3036	3.79	3382	3.4	1.11	5.13	26.9	540	20.1	VB	C	Riffle-Pool
R13.S2.03	650	565	2994	2.84	3434	2.48	1.15	4.94	26.5	601	22.7	VB	C	Riffle-Pool

Phase 1 - Step 2. Preliminary Reference Stream Type

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.1		2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.1		2.11	
	Elevation		Valley	Valley	Channel	Channel		Watershed	Channel	Valley	Confinement		Reference	
	Up	Down	Length	Slope	Length	Slope	Sinuosity	Area	Width	Width	Ratio	Type	Stream	Bedform
Reach ID	(ft.)	(ft.)	(ft.)	(%)	(ft.)	(%)		(sq. mi.)	(ft.)	(ft.)			Type	
R13.S2.04	785	650	2450	5.51	2579	5.23	1.05	4.52	25.4			NC	A	Step-Pool
R13.S2.04-S1.01	1100	780	6600	4.85	7286	4.39	1.1	3.32	22.2			SC	B	Step-Pool
R13.S2.04-S1.02	2080	1100	8300	11.81	8494	11.54	1.02	0.95	12.8			NC	A	Cascade
R13.S2.05	2100	785	9700	13.56	9868	13.33	1.02	1.09	13.6			NC	A	Cascade
R14	430	410	15828	0.13	16253	0.12	1.03	670.83	229.6	832	3.6	SC	B	Riffle-Pool
R15	480	430	4479	1.12	4681	1.07	1.05	663.6	228.5	764	3.3	SC	B	Riffle-Pool
R16	515	480	27092	0.13	28614	0.12	1.06	518.63	205	1339	6.5	BD	C	Riffle-Pool
R16.S1.01	518	490	1475	1.9	1532	1.83	1.04	8.8	34.1			VB	C	Riffle-Pool
R16.S1.02	615	518	2342	4.14	2428	4	1.04	8.67	33.9			SC	B	Step-Pool
R16.S1.03	695	615	4999	1.6	5570	1.44	1.11	8.53	33.6	613	18.2	VB	C	Riffle-Pool
R16.S1.03-S1.01	1125	695	10500	4.1	11465	3.75	1.09	1.91	17.4			NC	B	Step-Pool
R16.S1.03-S1.02	1720	1125	3400	17.5	3530	16.86	1.04	0.31	7.8			NC	A	Cascade
R16.S1.04	750	695	2594	2.12	2965	1.85	1.14	5.54	27.8	150	5.4	NW	C	Riffle-Pool
R16.S1.05	1020	750	8406	3.21	9170	2.94	1.09	4.98	26.5			SC	B	Plane Bed
R16.S1.06	1120	1020	3217	3.11	4208	2.38	1.31	2.94	21.1	100	4.7	NW	C	Riffle-Pool
R16.S1.07	1235	1120	3778	3.04	4382	2.62	1.16	1.51	15.7			NW	C	Riffle-Pool
R16.S1.08	1600	1235	4800	7.6	4923	7.41	1.03	0.38	8.6			NC	A	Cascade
R16.S2.01	535	490	3908	1.15	4488	1	1.15	10.07	36.2	926	25.6	VB	C	Riffle-Pool
R16.S2.02	630	535	5240	1.81	5908	1.61	1.13	9.54	35.3	100	2.8	SC	B	Plane Bed
R16.S2.02-S1.01	910	635	6900	3.99	7036	3.91	1.02	2.11	18.2			SC	B	Step-Pool
R16.S2.02-S1.02	1550	910	10000	6.4	10276	6.23	1.03	0.89	12.4			NC	A	Step-Pool
R16.S2.03	697	630	3131	2.14	3319	2.02	1.06	6.48	29.8	150	5	NW	C	Riffle-Pool
R16.S2.03-S1.01	790	698	4825	1.91	4925	1.87	1.02	4.42	25.2			SC	B	Plane Bed
R16.S2.03-S1.02	990	790	5650	3.54	5800	3.45	1.03	2.7	20.3			SC	B	Step-Pool
R16.S2.03-S1.03	1360	990	6400	5.78	6597	5.61	1.03	1.31	14.8			SC	B	Step-Pool
R16.S2.04	1500	697	9990	8.04	10144	7.92	1.02	1.51	15.7			NC	A	Cascade
T1.01	2090	440	11000	15	11221	14.7	1.02	0.99	13.1			NC	A	Cascade

Phase 1 - Step 3. Basin Characteristics: Geology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	3.1	3.2	3.3 Geologic Materials			3.4 Valley Side Slope	
Reach ID	Alluvial Fan	Grade Control	Dominant	%	Sub-Dominant	Left	Right
M02.01	None	None	Alluvial	55	Glacial Lake	Extremely Steep	Extremely Steep
M02.02	None	None	Glacial Lake	48	Ice-Contact	Extremely Steep	Extremely Steep
M02.03	None	None	Glacial Lake	58	Ice-Contact	Extremely Steep	Extremely Steep
M02.04	None	None	Glacial Lake	47	Alluvial	Very Steep	Extremely Steep
R07	None	None	Alluvial	79	Glacial Lake	Extremely Steep	Steep
R08	None	None	Alluvial	74	Glacial Lake	Extremely Steep	Steep
R09	None	None	Alluvial	79	Ice-Contact	Very Steep	Very Steep
R09.S1.01	Yes	None	Alluvial	66	Ice-Contact	Very Steep	Extremely Steep
R09.S1.02	None	Waterfall	Ice-Contact	53	Glacial Lake	Very Steep	Steep
R09.S1.03	None	None	Ice-Contact	100	---	Extremely Steep	Extremely Steep
R09.S1.03-S1.01			Ice-Contact	87	Till		
R09.S1.03-S1.01-S1.01			Till	64	Ice-Contact		
R09.S1.03-S1.02			Ice-Contact	80	Glacial Lake		
R09.S1.03-S1.03			Till	85	Ice-Contact		
R09.S1.04	None	None	Ice-Contact	100	---	Very Steep	Very Steep
R09.S1.04-S1.01			Till	75	Ice-Contact		
R09.S1.05	Yes	None	Till	68	Ice-Contact	Extremely Steep	Extremely Steep
R10	None	None	Alluvial	56	Glacial Lake	Extremely Steep	Very Steep
R10.S1.01	None	Waterfall	Ice-Contact	85	Alluvial	Extremely Steep	Extremely Steep
R10.S1.02	None		Till	85	Ice-Contact	Extremely Steep	Extremely Steep
R10.S1.02-S1.01			Till	94	Ice-Contact		
R10.S1.03	None		Ice-Contact	100	---	Extremely Steep	Very Steep
R10.S1.03-S1.01			Till	58	Ice-Contact		
R10.S1.04	None	None	Ice-Contact	55	Till	Extremely Steep	Extremely Steep
R10.S1.05	None	None	Other	83	Till	Very Steep	Extremely Steep
R10.S1.06	None		Till	99	---	Steep	Extremely Steep
R10.S1.07	None	None	Till	91	Ice-Contact	Very Steep	Extremely Steep

Phase 1 - Step 3. Basin Characteristics: Geology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	3.1	3.2	3.3 Geologic Materials			3.4 Valley Side Slope	
Reach ID	Alluvial Fan	Grade Control	Dominant	%	Sub-Dominant	Left	Right
R10.S2.01	Yes	None	Alluvial	75	Till	Extremely Steep	Very Steep
R10.S2.01-S1.01			Till	99	---		
R10.S2.02	None	None	Till	79	Alluvial	Very Steep	Extremely Steep
R10.S2.02-S1.01			Till	93	Ice-Contact		
R10.S2.03	None	None	Till	94	Alluvial	Very Steep	Very Steep
R10.S2.03-S1.01			Till	99	---		
R10.S2.04	None	None	Till	100	---	Extremely Steep	Steep
R10.S2.04-S1.01			Till	100	---		
R10.S2.05	None	None	Till	100	---	Very Steep	Very Steep
R10.S2.06	None	None	Till	100	---	Extremely Steep	Extremely Steep
R10.S3.01	Yes	None	Alluvial	69	Till	Extremely Steep	Extremely Steep
R10.S3.02	None	Ledge	Till	85	Glacial Lake	Extremely Steep	Extremely Steep
R10.S3.02-S1.01			Till	99	---		
R10.S3.03	None		Till	98	Ice-Contact	Extremely Steep	Extremely Steep
R10.S3.03-S1.01			Till	76	Ice-Contact		
R10.S3.04	None	None	Ice-Contact	36	Till	Extremely Steep	Extremely Steep
R10.S3.04-S1.01			Till	89	Ice-Contact		
R10.S3.05	None	None	Till	86	Alluvial	Extremely Steep	Extremely Steep
R10.S3.05-S1.01			Till	99	---		
R10.S3.05-S1.01-S1.01			Till	99	---		
R10.S3.05-S1.02			Till	99	---		
R10.S3.06	None		Till	99	---	Extremely Steep	Extremely Steep
R10.S3.07	None	None	Till	99	---	Extremely Steep	Extremely Steep
R10.S4.01	None	None	Ice-Contact	65	Alluvial	Steep	Steep
R10.S4.02	None		Till	77	Alluvial	Extremely Steep	Extremely Steep
R10.S4.02-S1.01			Till	99	---		
R10.S4.03	None		Till	100	---	Extremely Steep	Extremely Steep

Phase 1 - Step 3. Basin Characteristics: Geology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	3.1	3.2	3.3 Geologic Materials			3.4 Valley Side Slope	
Reach ID	Alluvial Fan	Grade Control	Dominant	%	Sub-Dominant	Left	Right
R10.S4.03-S1.01			Till	71	Other		
R10.S4.04	None		Till	99	---	Extremely Steep	Extremely Steep
R11	None	Dam	Alluvial	37	Ice-Contact	Extremely Steep	Extremely Steep
R11.S1.01	None	None	Glacial Lake	59	Till	Very Steep	Extremely Steep
R11.S1.02	None	None	Till	95	Glacial Lake	Extremely Steep	Extremely Steep
R11.S1.03	None	None	Till	100	---	Extremely Steep	Extremely Steep
R11.S1.03-S1.01			Till	99	---		
R11.S1.04	None	None	Till	98	Glacial Lake	Extremely Steep	Extremely Steep
R11.S1.04-S1.01			Till	92	Glacial Lake		
R11.S1.05	None	None	Till	100	---	Extremely Steep	Extremely Steep
R11.S1.05-S1.01			Till	100	---		
R11.S1.05-S1.02			Till	99	---		
R11.S1.06	None	None	Till	95	Ice-Contact	Very Steep	Very Steep
R11.S1.06-S1.01			Ice-Contact	50	Till		
R11.S1.06-S1.01-S1.01			Till	99	---		
R11.S1.06-S1.02			Till	99	---		
R11.S1.07	None	None	Till	58	Ice-Contact	Very Steep	Very Steep
R11.S1.08	None		Till	99	---	Extremely Steep	Extremely Steep
R12	None	None	Alluvial	51	Glacial Lake	Extremely Steep	Very Steep
R13	None	None	Alluvial	43	Glacial Lake	Extremely Steep	Very Steep
R13.S1.01	None	None	Alluvial	77	Glacial Lake	Very Steep	Steep
R13.S1.02	None	Multiple	Glacial Lake	67	Till	Very Steep	Extremely Steep
R13.S1.02-S1.01	None	Multiple	Alluvial	79	Glacial Lake	Steep	Very Steep
R13.S1.02-S1.02	None	None	Alluvial	95	Glacial Lake	Very Steep	Very Steep
R13.S1.02-S1.02-S1.01			Ice-Contact	51	Alluvial		
R13.S1.02-S1.02-S1.02			Till	60	Ice-Contact		
R13.S1.02-S1.03	None	None	Alluvial	89	Glacial Lake	Hilly	Very Steep

Phase 1 - Step 3. Basin Characteristics: Geology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	3.1	3.2	3.3 Geologic Materials			3.4 Valley Side Slope	
Reach ID	Alluvial Fan	Grade Control	Dominant	%	Sub-Dominant	Left	Right
R13.S1.02-S1.03-S1.01			Alluvial	61	Glacial Lake		
R13.S1.02-S1.03-S1.02			Till	82	Ice-Contact		
R13.S1.02-S1.04	None	None	Alluvial	89	Glacial Lake	Extremely Steep	Steep
R13.S1.02-S1.05	None	None	Alluvial	87	Glacial Lake	Steep	Flat
R13.S1.02-S1.06	None	None	Alluvial	87	Ice-Contact	Very Steep	Hilly
R13.S1.02-S1.07	None		Till	100	---	Extremely Steep	Extremely Steep
R13.S1.02-S1.07-S1.01			Till	100	---		
R13.S1.02-S1.07-S1.02			Till	99	---		
R13.S1.02-S1.08	None		Till	70	Ice-Contact	Very Steep	Very Steep
R13.S1.02-S1.09	None	None	Alluvial	36	Ice-Contact	Hilly	Hilly
R13.S1.02-S1.10	None	None	Till	86	Ice-Contact	Extremely Steep	Extremely Steep
R13.S1.03	None	None	Alluvial	84	Glacial Lake	Very Steep	Very Steep
R13.S1.04	None		Glacial Lake	72	Till	Very Steep	Very Steep
R13.S1.05	None	None	Alluvial	42	Till	Steep	Steep
R13.S1.06	None	None	Till	99	---	Extremely Steep	Extremely Steep
R13.S2.01	None	None	Alluvial	90	Glacial Lake	Steep	Extremely Steep
R13.S2.01-S1.01			Alluvial	93	Glacial Lake		
R13.S2.01-S1.02			Alluvial	72	Glacial Lake		
R13.S2.01-S1.03			Till	94	Alluvial		
R13.S2.02	None	Multiple	Alluvial	67	Glacial Lake	Extremely Steep	Very Steep
R13.S2.03	None	None	Alluvial	77	Ice-Contact	Very Steep	Very Steep
R13.S2.04	None	None	Ice-Contact	61	Till	Extremely Steep	Extremely Steep
R13.S2.04-S1.01			Ice-Contact	83	Till		
R13.S2.04-S1.02			Ice-Contact	82	Till		
R13.S2.05	None	None	Ice-Contact	57	Till	Extremely Steep	Extremely Steep
R14	None	Ledge	Ice-Contact	36	Alluvial	Very Steep	Extremely Steep
R15	None	Dam	Ice-Contact	52	Glacial Lake	Steep	Steep

Phase 1 - Step 3. Basin Characteristics: Geology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	3.1	3.2	3.3 Geologic Materials			3.4 Valley Side Slope	
Reach ID	Alluvial Fan	Grade Control	Dominant	%	Sub-Dominant	Left	Right
R16	None	None	Alluvial	60	Glacial Lake	Extremely Steep	Very Steep
R16.S1.01	None	None	Alluvial	76	Glacial Lake	Extremely Steep	Extremely Steep
R16.S1.02	None	None	Glacial Lake	54	Till	Extremely Steep	Extremely Steep
R16.S1.03	None	None	Alluvial	86	Till	Very Steep	Very Steep
R16.S1.03-S1.01			Till	75	Ice-Contact		
R16.S1.03-S1.02			Till	99	---		
R16.S1.04	None	None	Alluvial	86	Till	Extremely Steep	Extremely Steep
R16.S1.05	None	Weir	Till	59	Alluvial	Extremely Steep	Extremely Steep
R16.S1.06	None	None	Till	72	Alluvial	Very Steep	Steep
R16.S1.07	None		Till	99	---	Steep	Steep
R16.S1.08	None	None	Till	99	---	Steep	Steep
R16.S2.01	None	None	Alluvial	82	Glacial Lake	Extremely Steep	Extremely Steep
R16.S2.02	None	None	Till	53	Ice-Contact	Extremely Steep	Extremely Steep
R16.S2.02-S1.01			Till	95	Ice-Contact		
R16.S2.02-S1.02			Till	100	---		
R16.S2.03	None	Ledge	Ice-Contact	93	Till	Very Steep	Extremely Steep
R16.S2.03-S1.01			Ice-Contact	57	Till		
R16.S2.03-S1.02			Till	92	Glacial Lake		
R16.S2.03-S1.03			Till	99	---		
R16.S2.04	None	None	Till	58	Ice-Contact	Very Steep	Very Steep
T1.01	None	None	Till	78	Glacial Lake	Steep	Steep

Phase 1 - Step 3. Basin Characteristics: Soils

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	3.5 Soil Properties									
	Hydrologic				Water Table					
Reach ID	Group	%	Flooding	%	Deep	%	Shallow	%	Erodibility	%
M02.01	C	48	Frequent	55	6	51	6	51	Moderate	28
M02.02	C	50	None/Rare	84	6	47	6	47	Moderate	49
M02.03	C	46	None/Rare	94	6	53	6	53	Very Severe	92
M02.04	B	69	None/Rare	60	6	82	6	82	Moderate	48
R07	B	74	Frequent	50	6	59	4	47	Slight	9
R08	B	77	Frequent	48	6	70	4	53	Slight	16
R09	B	78	Occasional	49	6	78	4	60	Slight	13
R09.S1.01	C	38	Frequent	57	6	41	0	38	Moderate	29
R09.S1.02	B	71	None/Rare	100	3	25	1.5	25	Moderate	46
R09.S1.03	B	83	None/Rare	100	3	61	1.5	61	Slight	22
R09.S1.03-S1.01	B	44	None/Rare	100	6	43	6	43	Severe	74
R09.S1.03-S1.01-S1.01	C	64	None/Rare	100	2.5	49	1.5	62	Very Severe	99
R09.S1.03-S1.02	B	51	None/Rare	100	0.5	42	-1	42	Slight	19
R09.S1.03-S1.03	C	75	None/Rare	100	2.5	69	1.5	69	Very Severe	95
R09.S1.04	B	91	None/Rare	100	1.5	56	0.5	56	Moderate	42
R09.S1.04-S1.01	D	49	None/Rare	100	2	37	0	37	Very Severe	80
R09.S1.05	D	70	None/Rare	97	6	85	2	61	Very Severe	86
R10	B	60	None/Rare	43	6	71	4	33	Moderate	34
R10.S1.01	A	85	None/Rare	87	6	87	6	85	Severe	71
R10.S1.02	D	85	None/Rare	100	6	100	2	85	Very Severe	94
R10.S1.02-S1.01	D	53	None/Rare	100	6	58	2	53	Very Severe	94
R10.S1.03	B	56	None/Rare	100	1.5	56	0.5	56	Moderate	33
R10.S1.03-S1.01	C	51	None/Rare	100	6	42	6	40	Very Severe	99
R10.S1.04	A	53	None/Rare	100	6	59	6	53	Very Severe	78
R10.S1.05	D	91	None/Rare	100	0	83	-1	83	Slight	15
R10.S1.06	C	64	None/Rare	100	3.5	57	2	93	Very Severe	99
R10.S1.07	C	91	None/Rare	100	3.5	91	2	91	Very Severe	98

Phase 1 - Step 3. Basin Characteristics: Soils

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	3.5 Soil Properties								
	Hydrologic				Water Table				
Reach ID	Group	%	Flooding	%	Deep	%	Shallow	%	Erodibility	%
R10.S2.01	B	45	Frequent	75	6	50	4	44	Slight	18
R10.S2.01-S1.01	C	81	None/Rare	100	2.5	81	1.5	81	Very Severe	99
R10.S2.02	C	79	None/Rare	79	2.5	79	1.5	79	Very Severe	78
R10.S2.02-S1.01	D	66	None/Rare	99	6	65	2	60	Very Severe	99
R10.S2.03	C	94	None/Rare	96	2.5	94	1.5	94	Very Severe	96
R10.S2.03-S1.01	C	93	None/Rare	100	2.5	93	1.5	93	Very Severe	100
R10.S2.04	C	100	None/Rare	100	2.5	74	1.5	74	Very Severe	99
R10.S2.04-S1.01	C	100	None/Rare	100	2.5	68	1.5	68	Very Severe	99
R10.S2.05	C	100	None/Rare	100	2.5	74	1.5	74	Very Severe	99
R10.S2.06	C	100	None/Rare	100	2.5	100	1.5	100	Very Severe	99
R10.S3.01	B	67	Occasional	58	6	68	4	58	Slight	22
R10.S3.02	C	84	None/Rare	100	2.5	77	1.5	77	Very Severe	99
R10.S3.02-S1.01	C	59	None/Rare	100	2.5	59	1.5	59	Very Severe	99
R10.S3.03	C	98	None/Rare	100	2.5	92	1.5	92	Very Severe	97
R10.S3.03-S1.01	C	62	None/Rare	100	2.5	47	1.5	47	Very Severe	90
R10.S3.04	A	36	None/Rare	72	6	47	6	38	Moderate	35
R10.S3.04-S1.01	D	46	None/Rare	97	6	44	2	49	Very Severe	87
R10.S3.05	C	75	None/Rare	87	2.5	75	1.5	75	Very Severe	86
R10.S3.05-S1.01	C	91	None/Rare	100	2.5	91	1.5	91	Very Severe	99
R10.S3.05-S1.01-S1.01	D	96	None/Rare	100	2	60	0	60	Very Severe	99
R10.S3.05-S1.02	D	76	None/Rare	100	2	44	0	44	Very Severe	99
R10.S3.06	C	99	None/Rare	100	2.5	99	1.5	99	Very Severe	99
R10.S3.07	D	72	None/Rare	100	2	56	0	56	Very Severe	99
R10.S4.01	A	65	None/Rare	78	6	100	6	65	Very Severe	77
R10.S4.02	C	56	None/Rare	83	3.5	56	2	77	Very Severe	83
R10.S4.02-S1.01	D	83	None/Rare	100	6	81	2	98	Very Severe	97
R10.S4.03	C	100	None/Rare	100	3.5	61	2	61	Very Severe	99

Phase 1 - Step 3. Basin Characteristics: Soils

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	3.5 Soil Properties									
	Hydrologic				Water Table					
Reach ID	Group	%	Flooding	%	Deep	%	Shallow	%	Erodibility	%
R10.S4.03-S1.01	D	69	None/Rare	100	6	31	2	45	Severe	70
R10.S4.04	D	53	None/Rare	100	6	41	2	69	Very Severe	86
R11	B	55	None/Rare	62	6	81	6	55	Severe	53
R11.S1.01	B	100	None/Rare	86	6	100	6	100	Very Severe	86
R11.S1.02	C	90	None/Rare	100	2.5	90	1.5	90	Very Severe	100
R11.S1.03	C	100	None/Rare	100	2.5	100	1.5	100	Very Severe	100
R11.S1.03-S1.01	D	60	None/Rare	100	6	60	6	60	Very Severe	99
R11.S1.04	C	98	None/Rare	100	2.5	98	1.5	98	Very Severe	100
R11.S1.04-S1.01	C	50	None/Rare	100	2.5	50	1.5	50	Very Severe	100
R11.S1.05	C	100	None/Rare	100	2.5	100	1.5	100	Very Severe	100
R11.S1.05-S1.01	C	100	None/Rare	100	2.5	54	1.5	54	Very Severe	99
R11.S1.05-S1.02	C	87	None/Rare	100	6	79	6	79	Very Severe	99
R11.S1.06	C	95	None/Rare	100	2.5	95	1.5	95	Very Severe	99
R11.S1.06-S1.01	A	50	None/Rare	100	6	50	6	50	Very Severe	99
R11.S1.06-S1.01-S1.01	C	49	None/Rare	100	6	69	6	69	Very Severe	99
R11.S1.06-S1.02	D	63	None/Rare	100	6	63	6	63	Very Severe	99
R11.S1.07	C	58	None/Rare	100	6	41	6	41	Very Severe	99
R11.S1.08	B	91	None/Rare	100	6	91	6	91	Very Severe	99
R12	B	54	Frequent	51	6	78	6	78	Moderate	40
R13	B	61	None/Rare	56	6	82	6	82	Severe	53
R13.S1.01	B	98	Frequent	77	6	96	6	96	Slight	22
R13.S1.02	C	80	None/Rare	85	3	64	1.5	65	Very Severe	85
R13.S1.02-S1.01	B	78	Frequent	79	3	68	1.5	68	Slight	19
R13.S1.02-S1.02	B	72	Frequent	95	3	74	1.5	74	Slight	3
R13.S1.02-S1.02-S1.01	B	80	None/Rare	68	2.5	49	1.5	69	Slight	19
R13.S1.02-S1.02-S1.02	C	36	None/Rare	100	6	63	6	63	Very Severe	89
R13.S1.02-S1.03	B	92	Frequent	89	3	95	1.5	95	Slight	9

Phase 1 - Step 3. Basin Characteristics: Soils

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	3.5 Soil Properties									
	Hydrologic				Water Table					
Reach ID	Group	%	Flooding	%	Deep	%	Shallow	%	Erodibility	%
R13.S1.02-S1.03-S1.01	C	75	Frequent	61	1.5	45	0	51	Moderate	38
R13.S1.02-S1.03-S1.02	C	52	None/Rare	99	2.5	45	1.5	45	Very Severe	99
R13.S1.02-S1.04	C	52	Frequent	89	1.5	47	1.5	47	Slight	10
R13.S1.02-S1.05	C	98	Frequent	87	1.5	87	0	87	Slight	11
R13.S1.02-S1.06	C	92	Frequent	87	1.5	87	0	87	Slight	11
R13.S1.02-S1.07	B	100	None/Rare	100	6	100	6	100	Very Severe	100
R13.S1.02-S1.07-S1.01	B	100	None/Rare	100	6	100	6	100	Very Severe	100
R13.S1.02-S1.07-S1.02	B	39	None/Rare	100	6	83	6	83	Very Severe	99
R13.S1.02-S1.08	B	98	None/Rare	100	6	70	6	70	Very Severe	99
R13.S1.02-S1.09	C	71	None/Rare	63	1.5	36	0	36	Severe	63
R13.S1.02-S1.10	D	53	None/Rare	100	6	83	6	83	Very Severe	80
R13.S1.03	C	68	Frequent	84	1.5	57	0	59	Slight	15
R13.S1.04	C	86	None/Rare	100	3	72	1.5	73	Very Severe	99
R13.S1.05	C	62	None/Rare	57	1.5	50	0	42	Severe	55
R13.S1.06	C	68	None/Rare	100	6	90	6	90	Very Severe	99
R13.S2.01	C	57	Frequent	90	1.5	59	0	57	Slight	9
R13.S2.01-S1.01	C	93	Frequent	93	1.5	93	0	93	Slight	6
R13.S2.01-S1.02	C	78	Frequent	72	1.5	78	0	72	Moderate	26
R13.S2.01-S1.03	D	57	None/Rare	95	1.5	61	0	61	Very Severe	95
R13.S2.02	B	38	Frequent	67	1.5	50	6	49	Moderate	31
R13.S2.03	A	67	Frequent	77	6	74	6	74	Slight	22
R13.S2.04	A	61	None/Rare	100	6	100	6	100	Very Severe	100
R13.S2.04-S1.01	A	82	None/Rare	100	6	98	6	98	Very Severe	99
R13.S2.04-S1.02	A	75	None/Rare	100	6	92	6	92	Very Severe	99
R13.S2.05	A	57	None/Rare	100	6	98	6	98	Very Severe	99
R14	A	42	None/Rare	71	6	94	6	94	Severe	54
R15	A	52	None/Rare	94	6	71	6	71	Very Severe	86

Phase 1 - Step 3. Basin Characteristics: Soils

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	3.5 Soil Properties									
	Hydrologic				Water Table					
Reach ID	Group	%	Flooding	%	Deep	%	Shallow	%	Erodibility	%
R16	B	57	Frequent	60	6	72	6	72	Moderate	33
R16.S1.01	B	99	Frequent	76	6	100	6	100	Slight	23
R16.S1.02	C	78	None/Rare	96	6	63	6	63	Very Severe	96
R16.S1.03	C	61	Frequent	86	1.5	49	0	49	Slight	13
R16.S1.03-S1.01	C	64	None/Rare	97	2.5	34	1.5	34	Very Severe	97
R16.S1.03-S1.02	C	99	None/Rare	100	6	58	6	58	Very Severe	99
R16.S1.04	C	54	Frequent	86	6	45	6	45	Slight	13
R16.S1.05	C	91	None/Rare	67	2.5	59	1.5	59	Severe	67
R16.S1.06	C	99	None/Rare	72	2.5	71	1.5	71	Severe	71
R16.S1.07	D	82	None/Rare	100	1.5	82	0	82	Very Severe	99
R16.S1.08	C	93	None/Rare	100	2	70	0.5	70	Very Severe	99
R16.S2.01	C	86	Frequent	82	1.5	82	0	82	Slight	17
R16.S2.02	C	67	None/Rare	100	2.5	48	1.5	70	Very Severe	88
R16.S2.02-S1.01	C	61	None/Rare	100	6	71	6	71	Very Severe	99
R16.S2.02-S1.02	C	97	None/Rare	100	6	100	6	100	Very Severe	100
R16.S2.03	B	88	None/Rare	100	2.5	82	1.5	83	Very Severe	88
R16.S2.03-S1.01	B	44	None/Rare	100	2.5	70	1.5	74	Very Severe	99
R16.S2.03-S1.02	C	100	None/Rare	100	2.5	82	1.5	89	Very Severe	100
R16.S2.03-S1.03	C	100	None/Rare	100	2.5	66	1.5	66	Very Severe	99
R16.S2.04	C	46	None/Rare	100	2.5	50	1.5	50	Very Severe	93
T1.01	C	79	None/Rare	97	2	41	0.5	41	Very Severe	95

Phase 1 - Step 4. Land Cover - Reach Hydrology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	4.1 Watershed Land Cover - Land Use							4.2 Corridor Land Cover - Land Use							4.3 Riparian Buffer			4.4
		Current							Current						Width (ft.)			Groundwater
Reach ID	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	L Bank	R Bank	Impact	Inputs
M02.01	Forest	Forest	76	Crop	2	3	Low	Forest	Forest	31	Urban	23	18	High	>100	>100	Low	Minimal
M02.02	Forest	Forest	76	Crop	2	3	Low	Forest	Forest	47	Urban	14	8	High	>100	>100	N.S.	Minimal
M02.03	Forest	Forest	76	Crop	2	3	Low	Forest	Forest	52	Urban	15	4	High	>100	51-100	N.S.	Minimal
M02.04	Forest	Forest	76	Crop	2	3	Low	Forest	Forest	49	Urban	11	6	High	>100	>100	N.S.	Abundant
R07	Forest	Forest	74	Urban	6	4	High	Crop	Crop	36	Field	8	36	High	>100	51-100	N.S.	Abundant
R08	Forest	Forest	76	Urban	6	4	High	Field	Field	22	Urban	20	16	High	>100	>100	N.S.	Abundant
R09	Forest	Forest	77	Crop	4	4	Low	Crop	Crop	28	Urban	21	28	High	>100	0-25	Low	Abundant
R09.S1.01	Forest	Forest	84	Urban	5	2	Low	Residential	Urban	51	Crop	51	16	High	0-25	26-50	Low	Minimal
R09.S1.02	Forest	Forest	86	Urban	3	1	Low	Residential	Urban	48	Forest	48	0	High	>100	51-100	Low	Abundant
R09.S1.03	Forest	Forest	88	Crop	1	1	Low	Forest	Forest	60	Urban	4		Low	>100	51-100	Low	Abundant
R09.S1.03-S1.01		Forest	88	Crop	1	2	Low		Forest	34	Urban	27	1	High			Unk.	
R09.S1.03-S1.01-S1.01		Forest	87	Crop	2	2	Low		Forest	69	Urban	2	0	Low			Unk.	
R09.S1.03-S1.02		Forest	88	Crop		1	N.S.		Forest	57	Wetland		0	N.S.			Unk.	
R09.S1.03-S1.03		Forest	93	Crop		1	N.S.		Forest	60	Crop		0	N.S.			Unk.	
R09.S1.04	Forest	Forest	90	Urban	2	0	Low	Forest	Forest	65	Crop		0	N.S.	>100	>100	N.S.	Minimal
R09.S1.04-S1.01		Forest	88	Urban	2	0	Low		Forest	46	Wetland	2	0	Low			Unk.	
R09.S1.05	Forest	Forest	91	Crop		0	N.S.	Forest	Forest	58	Crop		0	N.S.	>100	>100	N.S.	Abundant
R10	Forest	Forest	77	Urban	4	3	Low	Commercial	Urban	31	Forest	31	7	High	>100	>100	Low	Abundant
R10.S1.01	Forest	Forest	85	Urban	3	2	Low	Forest	Urban	32	Forest	32	3	High	>100	>100	N.S.	Minimal
R10.S1.02	Forest	Forest	87	Urban	2	1	Low	Forest	Forest	40	---			N.D.	>100	>100	N.S.	Minimal
R10.S1.02-S1.01		Forest	83	---			N.D.		Forest	54	---			N.D.			Unk.	
R10.S1.03	Forest	Forest	87	Urban	3	1	Low	Forest	Forest	23	Urban	0		N.S.	>100	>100	N.S.	Minimal
R10.S1.03-S1.01		Forest	88	Urban	2	1	Low		Forest	54	Urban	2	0	Low			Unk.	
R10.S1.04	Forest	Forest	86	Urban	3	2	Low	Forest	Forest	30	Wetland		0	N.S.	>100	>100	N.S.	Abundant
R10.S1.05	Forest	Forest	86	Urban	5	1	Low	Forest	Forest	59	Wetland			N.D.	>100	>100	N.S.	Abundant
R10.S1.06	Forest	Forest	86	Urban	4	1	Low	Forest	Forest	32	Shrub			N.D.	>100	>100	N.S.	Minimal
R10.S1.07	Forest	Forest	82	Crop	3	3	Low	Forest	Forest	39	Wetland	0	1	N.S.	>100	>100	N.S.	Abundant
R10.S2.01	Forest	Forest	84	Crop	1	2	Low	Forest	Urban	21	Forest	21	7	High	>100	>100	N.S.	Minimal
R10.S2.01-S1.01		Forest	81	Field		0	N.S.		Forest	36	Field			N.D.			Unk.	
R10.S2.02	Forest	Forest	86	Crop	0	2	Low	Forest	Forest	14	Urban	13		High	>100	>100	N.S.	Minimal
R10.S2.02-S1.01		Forest	74	Crop	2	6	Low		Forest	33	Urban	9	0	Low			Unk.	
R10.S2.03	Forest	Forest	86	Crop	0	2	Low	Forest	Forest	24	Urban	3	0	Low	>100	>100	N.S.	Abundant
R10.S2.03-S1.01		Forest	73	Crop	0	7	Low		Forest	72	Urban	3		Low			Unk.	
R10.S2.04	Forest	Forest	91	Crop	0	1	N.S.	Forest	Forest	38	Urban	14	2	High	>100	>100	N.S.	Abundant
R10.S2.04-S1.01		Forest	94	Crop	1	1	Low		Forest	92	Urban	5		Low			Unk.	
R10.S2.05	Forest	Forest	91	Crop	0	1	N.S.	Forest	Forest	40	Urban	1		N.S.	>100	>100	N.S.	Minimal
R10.S2.06	Forest	Forest	94	---			N.D.	Forest	Forest	57	---			N.D.	>100	>100	N.S.	Minimal
R10.S3.01	Forest	Forest	84	Urban	3	0	Low	Commercial	Urban	47	Forest	47		High	>100	>100	N.S.	Minimal
R10.S3.02	Forest	Forest	87	Field	1	0	N.S.	Forest	Forest	18	Urban	18	0	High	>100	>100	N.S.	Abundant

Phase 1 - Step 4. Land Cover - Reach Hydrology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	4.1 Watershed Land Cover - Land Use							4.2 Corridor Land Cover - Land Use							4.3 Riparian Buffer			4.4
		Current							Current						Width (ft.)			Groundwater
Reach ID	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	L Bank	R Bank	Impact	Inputs
R10.S3.02-S1.01		Forest	91	Crop		0	N.S.		Forest	41	Crop		0	N.S.			Unk.	
R10.S3.03	Forest	Forest	85	Field	1	0	N.S.	Forest	Forest	36	Field	0		N.S.	>100	>100	N.S.	Abundant
R10.S3.03-S1.01		Forest	77	Field	0	1	N.S.		Forest	24	Urban	5		Low			Unk.	
R10.S3.04	Forest	Forest	86	Urban	3	0	Low	Forest	Forest	23	Field	1		N.S.	>100	>100	N.S.	Abundant
R10.S3.04-S1.01		Forest	89	Crop	0	0	N.S.		Forest	36	Crop		0	N.S.			Unk.	
R10.S3.05	Forest	Forest	86	Urban	3	0	Low	Forest	Forest	19	Field	7		Low	>100	>100	N.S.	Minimal
R10.S3.05-S1.01		Forest	86	Field	1	0	N.S.		Urban	23	Forest	23		High			Unk.	
R10.S3.05-S1.01-S1.01		Forest	89	Field			N.D.		Forest	57	Field			N.D.			Unk.	
R10.S3.05-S1.02		Forest	87	Crop	0	0	N.S.		Forest	33	Field	0		N.S.			Unk.	
R10.S3.06	Forest	Forest	87	Urban	4	0	Low	Forest	Forest	25	Field	0		N.S.	>100	>100	N.S.	Abundant
R10.S3.07	Forest	Forest	90	Field	0	0	N.S.	Forest	Forest	34	Urban	2		Low	>100	>100	N.S.	Minimal
R10.S4.01	Forest	Forest	86	Crop	0	0	N.S.	Forest	Forest	33	Urban	12		High	>100	>100	N.S.	None
R10.S4.02	Forest	Forest	86	Crop		0	N.S.	Forest	Forest	49	---			N.D.	>100	>100	N.S.	Minimal
R10.S4.02-S1.01		Forest	81	Crop		1	N.S.		Forest	29	Crop		1	N.S.			Unk.	
R10.S4.03	Forest	Forest	85	Crop		0	N.S.	Forest	Forest	29	---			N.D.	>100	>100	N.S.	Abundant
R10.S4.03-S1.01		Forest	80	Crop		1	N.S.		Forest	37	Crop		1	N.S.			Unk.	
R10.S4.04	Forest	Forest	88	Crop		0	N.S.	Forest	Forest	27	Field			N.D.	>100	>100	N.S.	Abundant
R11	Forest	Forest	78	Urban	5	4	Low	Commercial	Urban	31	Forest	31	9	High	>100	>100	N.S.	Abundant
R11.S1.01	Forest	Forest	91	Crop	1	1	Low	Forest	Forest	22	Urban	19		High	>100	>100	N.S.	None
R11.S1.02	Forest	Forest	91	Crop	1	1	Low	Residential	Urban	34	Forest	34		High	>100	>100	N.S.	Minimal
R11.S1.03	Forest	Forest	92	Crop	1	1	Low	Residential	Urban	36	Forest	36	1	High	51-100	>100	N.S.	Minimal
R11.S1.03-S1.01		Forest	88	Crop	1	1	Low		Forest	56	Urban	2		Low			Unk.	
R11.S1.04	Forest	Forest	94	Urban	1	0	N.S.	Forest	Urban	34	Forest	34	0	High	>100	>100	N.S.	Minimal
R11.S1.04-S1.01		Forest	91	Crop	0	1	N.S.		Forest	76	Crop	0	0	N.S.			Unk.	
R11.S1.05	Forest	Forest	94	Urban	1	0	N.S.	Forest	Urban	41	Forest	41		High	>100	>100	N.S.	Minimal
R11.S1.05-S1.01		Forest	95	Urban	3	0	Low		Forest	90	Urban	6		Low			Unk.	
R11.S1.05-S1.02		Forest	97	Urban	0		N.S.		Forest	99	Urban	0		N.S.			Unk.	
R11.S1.06	Forest	Forest	94	Crop	1	1	Low	Forest	Forest	34	Urban	27	2	High	51-100	>100	Low	Abundant
R11.S1.06-S1.01		Forest	94	Crop	1	1	Low		Forest	59	Urban	5		Low			Unk.	
R11.S1.06-S1.01-S1.01		Forest	94	Crop	0	1	N.S.		Forest	82	Urban	1		N.S.			Unk.	
R11.S1.06-S1.02		Forest	94	Crop	0	1	N.S.		Forest	75	Urban	4		Low			Unk.	
R11.S1.07	Forest	Forest	98	Crop	0	0	N.S.	Forest	Forest	85	Urban	13		High	>100	>100	N.S.	Minimal
R11.S1.08	Forest	Forest	99	---			N.D.	Forest	Forest	99	---			N.D.	>100	>100	N.S.	Minimal
R12	Forest	Forest	76	Urban	5	4	Low	Crop	Crop	22	Urban	20	22	High	0-25	>100	Low	Abundant
R13	Forest	Forest	75	Urban	7	5	High	Commercial	Urban	37	Crop	37	18	High	0-25	>100	Low	Abundant
R13.S1.01	Field	Forest	65	Crop	8	9	High	Commercial	Urban	48	Forest	48	3	High	0-25	>100	Low	Abundant
R13.S1.02	Urban	Forest	66	Crop	8	9	High	Commercial	Urban	44	Crop	44	2	High	51-100	>100	N.S.	Minimal
R13.S1.02-S1.01	Field	Forest	67	Crop	7	8	High	Forest	Forest	19	Urban	16	15	High	>100	0-25	Low	Abundant
R13.S1.02-S1.02	Field	Forest	69	Crop	6	7	High	Field	Crop	19	Field	6	19	High	0-25	51-100	Low	Abundant

Phase 1 - Step 4. Land Cover - Reach Hydrology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	4.1 Watershed Land Cover - Land Use							4.2 Corridor Land Cover - Land Use							4.3 Riparian Buffer			4.4
		Current							Current						Width (ft.)			Groundwater
Reach ID	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	L Bank	R Bank	Impact	Inputs
R13.S1.02-S1.02-S1.01		Forest	64	Urban	10	7	High		Forest	19	Field	5	8	High			Unk.	
R13.S1.02-S1.02-S1.02		Forest	84	Urban	3	1	Low		Forest	57	Urban	4		Low			Unk.	
R13.S1.02-S1.03	Field	Forest	72	Crop	5	7	High	Field	Crop	24	Forest	3	24	High	0-25	51-100	Low	Minimal
R13.S1.02-S1.03-S1.01		Forest	70	Urban	8	7	High		Forest	34	Crop	3	8	High			Unk.	
R13.S1.02-S1.03-S1.02		Forest	72	Urban	8	4	High		Forest	55	Crop	3	3	Low			Unk.	
R13.S1.02-S1.04	Field	Forest	75	Crop	4	6	High	Field	Forest	24	Crop	12	13	High	>100	>100	Low	Abundant
R13.S1.02-S1.05	Field	Forest	76	Crop	3	5	Low	Shrub	Wetland	24	Forest	2	12	High	>100	>100	N.S.	Abundant
R13.S1.02-S1.06	Field	Forest	82	Crop	1	4	Low	Forest	Forest	45	Urban	11	1	High	>100	>100	N.S.	Minimal
R13.S1.02-S1.07	Forest	Forest	83	Crop	1	4	Low	Forest	Forest	53	---			N.D.	>100	>100	N.S.	Minimal
R13.S1.02-S1.07-S1.01		Forest	78	Crop	1	7	Low		Forest	43	---			N.D.			Unk.	
R13.S1.02-S1.07-S1.02		Forest	79	Crop	0	6	Low		Forest	52	Field	1	0	N.S.			Unk.	
R13.S1.02-S1.08	Forest	Forest	85	Crop	1	2	Low	Forest	Forest	59	---			N.D.	>100	>100	N.S.	Minimal
R13.S1.02-S1.09	Forest	Forest	85	Crop	1	2	Low	Forest	Forest	49	Urban	2		Low	>100	>100	N.S.	Abundant
R13.S1.02-S1.10	Forest	Forest	91	---			N.D.	Forest	Forest	56	Urban	0		N.S.	>100	>100	N.S.	Minimal
R13.S1.03	Forest	Forest	71	Crop	7	9	High	Forest	Forest	29	Crop	3	15	High	>100	>100	N.S.	Abundant
R13.S1.04	Field	Forest	73	Crop	6	8	High	Forest	Forest	66	Field	0		N.S.	>100	>100	N.S.	Minimal
R13.S1.05	Forest	Forest	81	Urban	6	4	High	Forest	Forest	32	Wetland	13	6	High	>100	>100	N.S.	Abundant
R13.S1.06	Forest	Forest	90	Urban	1		N.S.	Forest	Forest	54	Urban	0		N.S.	>100	>100	N.S.	Minimal
R13.S2.01	Forest	Forest	84	Urban	5	4	Low	Forest	Forest	32	Urban	22	3	High	>100	>100	N.S.	Abundant
R13.S2.01-S1.01		Forest	83	Urban	5	4	Low		Forest	89	Wetland			N.D.			Unk.	
R13.S2.01-S1.02		Forest	76	Urban	8	6	High		Forest	47	Crop	4	8	High			Unk.	
R13.S2.01-S1.03		Forest	86	Urban	5	3	Low		Forest	55	Urban	32	7	High			Unk.	
R13.S2.02	Forest	Forest	87	Crop	3	5	Low	Residential	Forest	24	Urban	18	5	High	>100	>100	N.S.	Minimal
R13.S2.03	Forest	Forest	88	Crop	3	5	Low	Forest	Forest	36	Urban	22	0	High	>100	51-100	N.S.	Minimal
R13.S2.04	Forest	Forest	89	Crop	2	4	Low	Forest	Forest	50	Urban	21		High	>100	>100	N.S.	Minimal
R13.S2.04-S1.01		Forest	90	Crop	2	5	Low		Forest	68	Urban	28	0	High			Unk.	
R13.S2.04-S1.02		Forest	91	Crop	0	6	Low		Forest	96	Crop	0	1	N.S.			Unk.	
R13.S2.05	Forest	Forest	91	Crop	1	2	Low	Forest	Forest	77	Urban	4	0	Low	>100	>100	N.S.	Minimal
R14	Forest	Forest	79	Urban	7	4	High	Commercial	Urban	29	Forest	29	12	High	>100	>100	Low	Abundant
R15	Forest	Forest	79	Urban	6	4	High	Field	Forest	30	Crop	14	24	High	>100	>100	N.S.	Abundant
R16	Forest	Forest	80	Urban	6	4	High	Crop	Urban	34	Crop	34	20	High	0-25	0-25	Low	Abundant
R16.S1.01	Forest	Forest	76	Crop	5	6	High	Forest	Urban	23	Forest	23	7	High	>100	>100	N.S.	Minimal
R16.S1.02	Forest	Forest	76	Crop	5	6	High	Forest	Urban	32	Forest	32	0	High	>100	>100	N.S.	Minimal
R16.S1.03	Forest	Forest	77	Crop	5	6	High	Forest	Forest	29	Urban	17	7	High	>100	26-50	N.S.	Minimal
R16.S1.03-S1.01		Forest	78	Crop	1	7	Low		Forest	41	Crop	2	4	Low			Unk.	
R16.S1.03-S1.02		Forest	91	Crop		1	N.S.		Forest	82	Crop		0	N.S.			Unk.	
R16.S1.04	Forest	Forest	78	Crop	5	6	High	Field	Forest	31	Urban	14		High	>100	51-100	N.S.	Minimal
R16.S1.05	Forest	Forest	77	Crop	5	7	High	Residential	Urban	41	Forest	41	1	High	>100	26-50	Low	Abundant
R16.S1.06	Forest	Forest	75	Crop	5	10	High	Forest	Forest	45	Urban	16	0	High	>100	>100	N.S.	Abundant

Phase 1 - Step 4. Land Cover - Reach Hydrology

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	4.1 Watershed Land Cover - Land Use							4.2 Corridor Land Cover - Land Use							4.3 Riparian Buffer			4.4
		Current							Current						Width (ft.)			
Reach ID	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	Historic	Dom.	%	Sub-D.	Urban	Crop	Impact	L Bank	R Bank	Impact	Groundwater Inputs
R16.S1.07	Forest	Forest	71	Crop	4	15	High	Field	Forest	31	Crop		11	High	0-25	>100	Low	Abundant
R16.S1.08	Field	Forest	61	Crop	8	22	High	Field	Crop	26	Forest	11	26	High	0-25	>100	Low	Minimal
R16.S2.01	Forest	Forest	88	Urban	5	2	Low	Field	Forest	26	Field	5	12	High	51-100	0-25	Low	Minimal
R16.S2.02	Forest	Forest	89	Urban	5	1	Low	Forest	Forest	30	Urban	24	0	High	51-100	>100	N.S.	Abundant
R16.S2.02-S1.01		Forest	88	Urban	6	0	Low		Urban	50	Forest	50	1	High			Unk.	
R16.S2.02-S1.02		Forest	89	Urban	4	0	Low		Forest	65	Urban	11	1	High			Unk.	
R16.S2.03	Forest	Forest	88	Urban	5	2	Low	Residential	Urban	40	Forest	40	0	High	51-100	>100	N.S.	Minimal
R16.S2.03-S1.01		Forest	90	Crop	3	3	Low		Urban	30	Forest	30	1	High			Unk.	
R16.S2.03-S1.02		Forest	91	Crop	2	3	Low		Urban	53	Forest	53	1	High			Unk.	
R16.S2.03-S1.03		Forest	88	Crop	2	6	Low		Forest	66	Urban	13	4	High			Unk.	
R16.S2.04	Forest	Forest	90	Urban	4	0	Low	Forest	Forest	75	Urban	9	1	High	>100	>100	N.S.	Minimal
T1.01	Forest	Forest	84	Urban	1	0	N.S.	Forest	Forest	53	Urban	1	0	N.S.	>100	>100	N.S.	Minimal

Phase 1 - Step 5. Instream Channel Modification

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	5.1 Flow Regulation		5.2 Bridges - Culverts				5.3 Bank Armoring			5.4 Channel Straightening			5.5 Dredging History	
Reach ID	Type	Impact	Number	Length	Percent	Impact	Length	Percent	Impact	Length	Percent	Impact	Type	Impact
M02.01	None	N.S.	4	1848	61.4	High	925	15.4	Low	1988	66.1	High	None	N.S.
M02.02	None	N.S.	0	0	0	N.S.	316	4.2	N.S.	2064	55.1	High	None	N.S.
M02.03	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
M02.04	None	N.S.	1	106	3.2	Low	None		N.S.	1924	57.4	High	None	N.S.
R07	None	N.S.	5	6764	17.9	Low	933	1.2	N.S.	6436	17	Low	Multiple	High
R08	None	N.S.	4	4990	26.6	High	3773	10.1	Low	11085	59.1	High	None	N.S.
R09	None	N.S.	0	0	0	N.S.	None		N.S.	13278	99.4	High	Multiple	High
R09.S1.01	None	N.S.	5	3352	97.6	High	969	14.1	Low	904	26.3	High	Gravel Mining	High
R09.S1.02	None	N.S.	3	518	7.5	Low	222	1.6	N.S.	804	11.6	Low	None	N.S.
R09.S1.03	None	N.S.	None			N.S.	None		N.S.	1174	62.4	High	None	N.S.
R09.S1.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R09.S1.03-S1.01-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R09.S1.03-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R09.S1.03-S1.03		Unk.				Unk.			Unk.			Unk.		Unk.
R09.S1.04	None	N.S.	1	66	9.5	Low	None		N.S.	None		N.S.	None	N.S.
R09.S1.04-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R09.S1.05	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R10	None	N.S.	1	1403	7.7	Low	6772	18.6	Low	13975	76.8	High	Commercial Mining	High
R10.S1.01	None	N.S.	6	3818	75.6	High	1163	11.5	Low	891	17.6	Low	None	N.S.
R10.S1.02	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S1.02-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S1.03	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S1.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S1.04	None	N.S.	1	93	1.5	Low	None		N.S.	None		N.S.	None	N.S.
R10.S1.05	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S1.06	None	N.S.				Unk.	None		N.S.	None		N.S.	None	N.S.
R10.S1.07	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S2.01	None	N.S.	1	260	9.2	Low	None		N.S.	1495	53	High	None	N.S.
R10.S2.01-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S2.02	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S2.02-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S2.03	None	N.S.	1	162	2.1	Low	None		N.S.	None		N.S.	None	N.S.
R10.S2.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S2.04	None	N.S.	1	293	22	High	None		N.S.	None		N.S.	None	N.S.
R10.S2.04-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S2.05	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S2.06	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S3.01	None	N.S.	4	2159	92.9	High	1563	33.6	High	1465	63	High	None	N.S.
R10.S3.02	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.

Phase 1 - Step 5. Instream Channel Modification

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	5.1 Flow Regulation		5.2 Bridges - Culverts				5.3 Bank Armoring			5.4 Channel Straightening			5.5 Dredging History	
Reach ID	Type	Impact	Number	Length	Percent	Impact	Length	Percent	Impact	Length	Percent	Impact	Type	Impact
R10.S3.02-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S3.03	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S3.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S3.04	Snowmaking	High	1	76	1.9	Low	None		N.S.	None		N.S.	None	N.S.
R10.S3.04-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S3.05	None	N.S.	1	452	16.5	Low	None		N.S.	None		N.S.	None	N.S.
R10.S3.05-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S3.05-S1.01-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S3.05-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S3.06	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S3.07	None	N.S.	1	172	3	Low	None		N.S.	None		N.S.	None	N.S.
R10.S4.01	None	N.S.	2	682	69.9	High	1634	83.8	High	805	82.6	High	None	N.S.
R10.S4.02	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S4.02-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S4.03	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R10.S4.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R10.S4.04	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R11	Impoundment	High	1	1138	6.5	Low	1857	5.3	N.S.	11768	66.9	High	None	N.S.
R11.S1.01	None	N.S.	2	1351	56.8	High	1779	37.4	High	None		N.S.	None	N.S.
R11.S1.02	None	N.S.	1	94	3	Low	None		N.S.	None		N.S.	None	N.S.
R11.S1.03	None	N.S.	1	338	10.9	Low	None		N.S.	None		N.S.	None	N.S.
R11.S1.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.04	None	N.S.	2	1182	34.1	High	959	13.8	Low	None		N.S.	None	N.S.
R11.S1.04-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.05	None	N.S.	1	351	11.4	Low	878	14.3	Low	None		N.S.	None	N.S.
R11.S1.05-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.05-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.06	None	N.S.	1	226	8	Low	None		N.S.	None		N.S.	None	N.S.
R11.S1.06-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.06-S1.01-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.06-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R11.S1.07	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R11.S1.08	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R12	None	N.S.	0	0	0	N.S.	1647	6.8	N.S.	6403	52.7	High	None	N.S.
R13	None	N.S.	3	6851	33.8	High	6458	15.9	Low	13536	66.8	High	None	N.S.
R13.S1.01	None	N.S.	6	4029	84.1	High	3230	33.7	High	3900	81.4	High	None	N.S.
R13.S1.02	None	N.S.	1	367	16.9	Low	1099	25.3	Low	None		N.S.	None	N.S.
R13.S1.02-S1.01	Impoundment	Low	3	521	7.9	Low	258	2	N.S.	None		N.S.	None	N.S.
R13.S1.02-S1.02	None	N.S.	1	271	5.9	Low	None		N.S.	None		N.S.	None	N.S.

Phase 1 - Step 5. Instream Channel Modification

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	5.1 Flow Regulation		5.2 Bridges - Culverts				5.3 Bank Armoring			5.4 Channel Straightening			5.5 Dredging History	
Reach ID	Type	Impact	Number	Length	Percent	Impact	Length	Percent	Impact	Length	Percent	Impact	Type	Impact
R13.S1.02-S1.02-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S1.02-S1.02-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S1.02-S1.03	None	N.S.	1	404	10.9	Low	None		N.S.	2662	71.8	High	Commercial Mining	High
R13.S1.02-S1.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S1.02-S1.03-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S1.02-S1.04	None	N.S.	1	507	7.9	Low	707	5.5	N.S.	None		N.S.	None	N.S.
R13.S1.02-S1.05	None	N.S.	1	501	11.2	Low	403	4.5	N.S.	2441	54.6	High	Commercial Mining	High
R13.S1.02-S1.06	None	N.S.	0	0	0	N.S.	333	3.5	N.S.	2603	54.1	High	Commercial Mining	High
R13.S1.02-S1.07	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R13.S1.02-S1.07-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S1.02-S1.07-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S1.02-S1.08	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R13.S1.02-S1.09	None	N.S.	2	264	5.8	Low	None		N.S.	2773	61.2	High	None	N.S.
R13.S1.02-S1.10	Drinking	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R13.S1.03	None	N.S.	1	312	3.6	Low	820	4.7	N.S.	None		N.S.	None	N.S.
R13.S1.04	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R13.S1.05	None	N.S.	2	338	11.7	Low	None		N.S.	None		N.S.	None	N.S.
R13.S1.06	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R13.S2.01	None	N.S.	1	177	3.2	Low	993	9	N.S.	3849	69.9	High	None	N.S.
R13.S2.01-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S2.01-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S2.01-S1.03		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S2.02	Impoundment	Low	2	671	19.8	Low	None		N.S.	1880	55.6	High	None	N.S.
R13.S2.03	None	N.S.	1	348	10.1	Low	None		N.S.	None		N.S.	None	N.S.
R13.S2.04	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R13.S2.04-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S2.04-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R13.S2.05	None	N.S.	2	254	2.6	Low	None		N.S.	None		N.S.	None	N.S.
R14	None	N.S.	1	2897	17.8	Low	2163	6.7	N.S.	2128	13.1	Low	Gravel Mining	Low
R15	Impoundment	High	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R16	None	N.S.	3	3960	13.8	Low	4130	7.2	N.S.	17692	61.8	High	Commercial Mining	High
R16.S1.01	None	N.S.	1	976	63.7	High	1405	45.9	High	830	54.2	High	None	N.S.
R16.S1.02	None	N.S.	0	0	0	N.S.	None		N.S.	None		N.S.	None	N.S.
R16.S1.03	None	N.S.	1	113	2	Low	877	7.9	N.S.	4690	84.2	High	None	N.S.
R16.S1.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S1.03-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S1.04	None	N.S.	0	0	0	N.S.	None		N.S.	2040	68.8	High	None	N.S.
R16.S1.05	None	N.S.	1	117	1.3	Low	988	5.4	N.S.	None		N.S.	None	N.S.
R16.S1.06	None	N.S.	2	769	18.3	Low	659	7.8	N.S.	None		N.S.	None	N.S.

Phase 1 - Step 5. Instream Channel Modification

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	5.1 Flow Regulation		5.2 Bridges - Culverts				5.3 Bank Armoring			5.4 Channel Straightening			5.5 Dredging History	
Reach ID	Type	Impact	Number	Length	Percent	Impact	Length	Percent	Impact	Length	Percent	Impact	Type	Impact
R16.S1.07	None	N.S.	None			N.S.	None		N.S.	None		N.S.	None	N.S.
R16.S1.08	None	N.S.	3	433	8.8	Low	None		N.S.	None		N.S.	None	N.S.
R16.S2.01	None	N.S.	1	481	10.7	Low	None		N.S.	2858	63.7	High	None	N.S.
R16.S2.02	None	N.S.	0	0	0	N.S.	529	4.5	N.S.	None		N.S.	None	N.S.
R16.S2.02-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S2.02-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S2.03	None	N.S.	0	0	0	N.S.	1038	15.6	Low	2593	78.1	High	Gravel Mining	Low
R16.S2.03-S1.01		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S2.03-S1.02		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S2.03-S1.03		Unk.				Unk.			Unk.			Unk.		Unk.
R16.S2.04	None	N.S.	2	283	2.8	Low	None		N.S.	703	6.9	Low	Gravel Mining	Low
T1.01	None	N.S.	1	91	0.8	Low	None		N.S.	None		N.S.	None	N.S.

Phase 1 - Step 6. Floodplain Modification and Planform Changes

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	6.1 Berms & Roads			6.2 Corridor Development			6.3 Depositional Features		6.4 Meander Migration		6.5 Meander Width Ratio			6.6 Wavelength Ratio		
Reach ID	**Length**	**Percent**	**Impact**	**Length**	**Percent**	**Impact**	**Type**	**Impact**	**Type**	**Impact**	**Width**	**Ratio**	**Impact**	**Length**	**Ratio**	**Impact**
M02.01	2991	99.4	High	1430.9	47.6	High	Point	Low	None	N.S.	160	1.5	High	695	6.7	Low
M02.02	3747	100	High	174.1	4.6	N.S.	Mid-channel	Low	None	N.S.	249	2.4	High	493	4.7	High
M02.03	2922	100	High	0	0	N.S.	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
M02.04	3345	99.9	High	0	0	N.S.	None	N.S.	None	N.S.	104	1	High	104	1	High
R07	45323	119.9	High	11877.6	31.4	High	Mid-channel	Low	Multiple	High	1781	6.5	N.S.	3061	11.2	N.S.
R08	23655	126.1	High	10078.3	53.7	High	Multiple	High	Multiple	High	269	1	High	269	1	High
R09	26679	199.8	High	5576.3	41.8	High	Mid-channel	High	Multiple	High	267	1	High	267	1	High
R09.S1.01	1602	46.7	High	1156.4	33.7	High	None	N.S.	None	N.S.	38	1.4	High	214	7.8	Low
R09.S1.02	3336	48.1	High	419.7	6.1	Low	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R09.S1.03	None		N.S.	None		N.S.	No Data	N.D.	None	N.S.	25	1	High	25	1	High
R09.S1.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R09.S1.03-S1.01-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R09.S1.03-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R09.S1.03-S1.03			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R09.S1.04	0	0	N.S.	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	63	3.2	Low	161	8.2	N.S.
R09.S1.04-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R09.S1.05	311	3.6	N.S.	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10	36170	198.8	High	10235.8	56.3	High	Mid-channel	High	Migration	Low	257	1	High	257	1	High
R10.S1.01	772	15.3	Low	841.8	16.7	Low	No Data	N.D.	Migration	Low	135	6	N.S.	374	16.6	High
R10.S1.02	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S1.02-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S1.03	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S1.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S1.04	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S1.05	0	0	N.S.	58.1	1.4	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S1.06	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	15	1.3	High	83	7.4	Low
R10.S1.07	139	4.2	N.S.	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	48	6.9	N.S.	146	21	High
R10.S2.01	2654	94	High	161.4	5.7	Low	None	N.S.	None	N.S.	30	1	High	30	1	High
R10.S2.01-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S2.02	792	26.7	High	0	0	N.S.	No Data	N.D.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.

Phase 1 - Step 6. Floodplain Modification and Planform Changes

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	6.1 Berms & Roads			6.2 Corridor Development			6.3 Depositional Features		6.4 Meander Migration		6.5 Meander Width Ratio			6.6 Wavelength Ratio		
Reach ID	**Length**	**Percent**	**Impact**	**Length**	**Percent**	**Impact**	**Type**	**Impact**	**Type**	**Impact**	**Width**	**Ratio**	**Impact**	**Length**	**Ratio**	**Impact**
R10.S2.02-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S2.03	479	6.3	Low	282.5	3.7	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S2.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S2.04	356	26.7	High	41.9	3.1	N.S.	None	N.S.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S2.04-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S2.05	161	4.3	N.S.	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S2.06	21	0.3	N.S.	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S3.01	567	24.4	High	1116.6	48.1	High	None	N.S.	None	N.S.	35	1	High	35	1	High
R10.S3.02	933	14.8	Low	0	0	N.S.	No Data	N.D.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S3.02-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S3.03	None		N.S.	None		N.S.	No Data	N.D.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S3.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S3.04	0	0	N.S.	0	0	N.S.	No Data	N.D.	Avulsion	Low	Not Applicable		Unk.	Not Applicable		Unk.
R10.S3.04-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S3.05	0	0	N.S.	93.4	3.4	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S3.05-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S3.05-S1.01-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S3.05-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S3.06	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S3.07	0	0	N.S.	109.3	1.9	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S4.01	209	21.4	High	444.2	45.6	High	None	N.S.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S4.02	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S4.02-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S4.03	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R10.S4.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R10.S4.04	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R11	33903	192.7	High	7950.5	45.2	High	Mid-channel	High	Avulsion	Low	254	1	High	254	1	High
R11.S1.01	91	3.8	N.S.	446.2	18.8	Low	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.02	2493	80.7	High	611.5	19.8	Low	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.03	2750	88.8	High	71.8	2.3	N.S.	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R11.S1.04	2295	66.2	High	374	10.8	Low	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.04-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.

Phase 1 - Step 6. Floodplain Modification and Planform Changes

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	6.1 Berms & Roads			6.2 Corridor Development			6.3 Depositional Features		6.4 Meander Migration		6.5 Meander Width Ratio			6.6 Wavelength Ratio		
Reach ID	**Length**	**Percent**	**Impact**	**Length**	**Percent**	**Impact**	**Type**	**Impact**	**Type**	**Impact**	**Width**	**Ratio**	**Impact**	**Length**	**Ratio**	**Impact**
R11.S1.05	2543	82.7	High	142.2	4.6	N.S.	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.05-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R11.S1.05-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R11.S1.06	1117	39.3	High	30.9	1.1	N.S.	No Data	N.D.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.06-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R11.S1.06-S1.01-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R11.S1.06-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R11.S1.07	1974	33.4	High	235.5	4	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R11.S1.08	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R12	18155	149.3	High	7538.4	62	High	Mid-channel	Low	Multiple	High	251	1	High	251	1	High
R13	33494	165.2	High	17709.7	87.4	High	Mid-channel	High	Avulsion	Low	235	1	High	235	1	High
R13.S1.01	3230	67.4	High	2343.7	48.9	High	Point	N.S.	Avulsion	Low	48	1	High	48	1	High
R13.S1.02	872	40.1	High	1745.2	80.3	High	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S1.02-S1.01	1859	28.1	High	1242.1	18.8	Low	Point	N.S.	Multiple	High	162	3.7	Low	240	5.5	High
R13.S1.02-S1.02	895	19.4	Low	156.6	3.4	N.S.	Point	Low	Multiple	Low	112	2.7	High	191	4.6	High
R13.S1.02-S1.02-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S1.02-S1.02-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S1.02-S1.03	861	23.2	High	48.6	1.3	N.S.	Point	High	Multiple	High	37	1	High	37	1	High
R13.S1.02-S1.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S1.02-S1.03-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S1.02-S1.04	1076	16.8	Low	1610.4	25.1	High	Point	High	Migration	High	185	5.7	N.S.	245	7.5	Low
R13.S1.02-S1.05	192	4.3	N.S.	163.7	3.7	N.S.	Point	N.S.	Migration	High	31	1	High	31	1	High
R13.S1.02-S1.06	814	16.9	Low	0	0	N.S.	No Data	N.D.	None	N.S.	29	1	High	29	1	High
R13.S1.02-S1.07	None		N.S.	None		N.S.	No Data	N.D.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S1.02-S1.07-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S1.02-S1.07-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S1.02-S1.08	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S1.02-S1.09	256	5.6	Low	89.7	2	N.S.	No Data	N.D.	Not Evaluated	N.D.	21	1	High	21	1	High
R13.S1.02-S1.10	290	2.7	N.S.	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S1.03	410	4.7	N.S.	1604.6	18.4	Low	No Data	N.D.	Avulsion	Low	82	4	Low	319	15.7	Low
R13.S1.04	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S1.05	493	17	Low	112.4	3.9	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S1.06	497	10.2	Low	0	0	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.

Phase 1 - Step 6. Floodplain Modification and Planform Changes

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	6.1 Berms & Roads			6.2 Corridor Development			6.3 Depositional Features		6.4 Meander Migration		6.5 Meander Width Ratio			6.6 Wavelength Ratio		
Reach ID	**Length**	**Percent**	**Impact**	**Length**	**Percent**	**Impact**	**Type**	**Impact**	**Type**	**Impact**	**Width**	**Ratio**	**Impact**	**Length**	**Ratio**	**Impact**
R13.S2.01	0	0	N.S.	486.1	8.8	Low	Point	N.S.	Migration	Low	34	1	High	34	1	High
R13.S2.01-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S2.01-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S2.01-S1.03			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S2.02	298	8.8	Low	463.1	13.7	Low	No Data	N.D.	Migration	Low	27	1	High	27	1	High
R13.S2.03	412	12	Low	805	23.4	High	No Data	N.D.	Avulsion	Low	90	3.4	Low	292	11	N.S.
R13.S2.04	1287	49.9	High	73.5	2.9	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R13.S2.04-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S2.04-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R13.S2.05	296	3	N.S.	107.2	1.1	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R14	28905	177.8	High	14090.2	86.7	High	Mid-channel	High	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R15	2636	56.3	High	2490.9	53.2	High	Mid-channel	Low	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R16	51543	180.1	High	20641.9	72.1	High	Mid-channel	Low	Avulsion	Low	205	1	High	205	1	High
R16.S1.01	0	0	N.S.	454.1	29.6	High	None	N.S.	None	N.S.	34	1	High	34	1	High
R16.S1.02	1993	82.1	High	391.3	16.1	Low	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R16.S1.03	1524	27.4	High	611.3	11	Low	Multiple	Low	Migration	Low	34	1	High	34	1	High
R16.S1.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S1.03-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S1.04	662	22.3	High	167.4	5.6	Low	No Data	N.D.	None	N.S.	28	1	High	28	1	High
R16.S1.05	7713	84.1	High	1545	16.8	Low	None	N.S.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R16.S1.06	1155	27.5	High	96.5	2.3	N.S.	No Data	N.D.	Not Evaluated	N.D.	138	6.6	N.S.	365	17.3	High
R16.S1.07	None		N.S.	None		N.S.	No Data	N.D.	Not Evaluated	N.D.	84	5.3	N.S.	227	14.4	Low
R16.S1.08	995	20.2	High	218.2	4.4	N.S.	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
R16.S2.01	0	0	N.S.	519.9	11.6	Low	None	N.S.	Migration	Low	36	1	High	36	1	High
R16.S2.02	2067	35	High	1326.1	22.4	High	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.
R16.S2.02-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S2.02-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S2.03	1452	43.8	High	237.9	7.2	Low	None	N.S.	None	N.S.	30	1	High	30	1	High
R16.S2.03-S1.01			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S2.03-S1.02			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S2.03-S1.03			Unk.			Unk.		Unk.		Unk.			Unk.			Unk.
R16.S2.04	768	7.6	Low	1166.8	11.5	Low	No Data	N.D.	Not Evaluated	N.D.	Not Applicable		Unk.	Not Applicable		Unk.
T1.01	0	0	N.S.	0	0	N.S.	None	N.S.	None	N.S.	Not Applicable		Unk.	Not Applicable		Unk.

Phase 1 - Step 7. Bed and Bank Windshield Survey

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.11 Stream Type					7.1 Bank Erosion - Bank Height			7.2 Ice & Debris Jam Potential	
Reach ID	Reference Stream Type	Mod. Ref. Stream Type	Dominant Bedform	Subclass Slope	Dominant Bed Material	Bank Erosion	Bank Height	Impact	Type	Impact
M02.01	C	No	Riffle-Pool	None	Gravel	Low	Medium	Low	None	N.S.
M02.02	C	No	Riffle-Pool	None	Gravel	None	No Data	Low	None	N.S.
M02.03	B	No	Plane Bed	c	Gravel	None	No Data	Low	None	N.S.
M02.04	C	No	Riffle-Pool	None	Gravel	None	No Data	Low	None	N.S.
R07	C	No	Riffle-Pool	None	Sand	High	High	High	Multiple	Low
R08	C	No	Riffle-Pool	None	Gravel	Low	High	High	Multiple	High
R09	C	No	Riffle-Pool	None	Gravel	Low	High	High	Multiple	High
R09.S1.01	C	No	Riffle-Pool	None	Gravel	Low	Low	Low	Culvert	Low
R09.S1.02	B	No	Step-Pool	None	Boulder	Low	Low	Low	Multiple	Low
R09.S1.03	C	No	Riffle-Pool	None	Gravel	None	No Data	N.S.	None	N.S.
R09.S1.03-S1.01	C	No	Riffle-Pool	b	Gravel			Unk.		Unk.
S1.01	A	No	Cascade	None	Boulder			Unk.		Unk.
R09.S1.03-S1.02	E	No	Riffle-Pool	None	Gravel			Unk.		Unk.
R09.S1.03-S1.03	A	No	Cascade	None	Boulder			Unk.		Unk.
R09.S1.04	C	No	Riffle-Pool	None	Gravel	None	No Data	N.S.	Bridge	High
R09.S1.04-S1.01	B	No	Step-Pool	a	Cobble			Unk.		Unk.
R09.S1.05	B	No	Step-Pool	None	Cobble	None	No Data	N.S.	None	N.S.
R10	C	No	Riffle-Pool	c	Gravel	Low	Medium	Low	Multiple	High
R10.S1.01	C	No	Riffle-Pool	b	Cobble	None	No Data	N.S.	Culvert	Low
R10.S1.02	A	No	Cascade	a	Bedrock	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S1.02-S1.01	A	No	Cascade	a	Bedrock			Unk.		Unk.
R10.S1.03	B	No	Step-Pool	a	Cobble	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S1.03-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S1.04	B	No	Step-Pool	None	Cobble	None	No Data	N.D.	Not Evaluated	N.D.
R10.S1.05	E	No	Riffle-Pool	None	Gravel	None	No Data	N.S.	None	N.S.
R10.S1.06	C	No	Riffle-Pool	None	Gravel	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S1.07	C	No	Riffle-Pool	None	Gravel	None	No Data	N.S.	None	N.S.
R10.S2.01	C	No	Riffle-Pool	b	Gravel	None	No Data	Low	None	N.S.
R10.S2.01-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S2.02	A	No	Cascade	None	Boulder	None	No Data	N.S.	None	N.S.

Phase 1 - Step 7. Bed and Bank Windshield Survey

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.11 Stream Type					7.1 Bank Erosion - Bank Height			7.2 Ice & Debris Jam Potential	
Reach ID	Reference Stream Type	Mod. Ref. Stream Type	Dominant Bedform	Subclass Slope	Dominant Bed Material	Bank Erosion	Bank Height	Impact	Type	Impact
R10.S2.02-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S2.03	B	No	Step-Pool	a	Boulder	None	No Data	N.S.	None	N.S.
R10.S2.03-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S2.04	A	No	Cascade	None	Boulder	None	No Data	N.S.	None	N.S.
R10.S2.04-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S2.05	B	No	Step-Pool	a	Boulder	None	No Data	N.S.	None	N.S.
R10.S2.06	A	No	Cascade	a	Boulder	None	No Data	N.S.	None	N.S.
R10.S3.01	C	No	Riffle-Pool	b	Cobble	Low	High	High	Bridge	Low
R10.S3.02	B	No	Step-Pool	a	Cobble	None	No Data	Low	Shallow	Low
R10.S3.02-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S3.03	B	No	Step-Pool	a	Cobble	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S3.03-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S3.04	B	No	Step-Pool	a	Cobble	Low	Low	High	Debris	Low
R10.S3.04-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S3.05	A	No	Cascade	None	Boulder	None	No Data	N.S.	None	N.S.
R10.S3.05-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S3.05-S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S3.06	A	No	Cascade	None	Boulder	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S3.07	A	No	Cascade	a	Boulder	None	No Data	N.S.	None	N.S.
R10.S4.01	B	No	Step-Pool	a	Cobble	None	No Data	N.S.	Culvert	Low
R10.S4.02	A	No	Cascade	a	Boulder	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S4.02-S1.01	A	No	Cascade	a	Bedrock			Unk.		Unk.
R10.S4.03	A	No	Cascade	a	Boulder	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R10.S4.03-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R10.S4.04	A	No	Cascade	a	Bedrock	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R11	C	No	Riffle-Pool	None	Gravel	Low	Medium	Low	Multiple	High

Phase 1 - Step 7. Bed and Bank Windshield Survey

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.11 Stream Type					7.1 Bank Erosion - Bank Height			7.2 Ice & Debris Jam Potential	
Reach ID	Reference Stream Type	Mod. Ref. Stream Type	Dominant Bedform	Subclass Slope	Dominant Bed Material	Bank Erosion	Bank Height	Impact	Type	Impact
R11.S1.01	B	No	Plane Bed	None	Cobble	None	No Data	Low	Culvert	Low
R11.S1.02	A	No	Step-Pool	None	Cobble	None	No Data	N.S.	Bridge	N.S.
R11.S1.03	B	No	Step-Pool	None	Boulder	None	No Data	N.S.	Bridge	Low
R11.S1.03-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R11.S1.04	B	No	Step-Pool	a	Cobble	None	No Data	N.S.	Bridge	N.S.
R11.S1.04-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R11.S1.05	A	No	Step-Pool	None	Cobble	None	No Data	N.S.	Debris	High
R11.S1.05-S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R11.S1.05-S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.
R11.S1.06	B	No	Step-Pool	a	Boulder	None	No Data	N.S.	Bridge	Low
R11.S1.06-S1.01	B	No	Step-Pool	a	Boulder			Unk.		Unk.
S1.01	A	No	Cascade	a	Boulder			Unk.		Unk.
R11.S1.06-S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.
R11.S1.07	B	No	Step-Pool	a	Boulder	None	No Data	N.S.	None	N.S.
R11.S1.08	A	No	Cascade	a	Boulder	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R12	C	No	Riffle-Pool	None	Gravel	Low	High	Low	None	N.S.
R13	C	No	Riffle-Pool	None	Gravel	Low	Medium	High	Multiple	Low
R13.S1.01	C	No	Riffle-Pool	None	Gravel	Low	Low	Low	Bridge	Low
R13.S1.02	B	No	Step-Pool	None	Cobble	None	No Data	N.S.	Bridge	N.S.
R13.S1.02-S1.01	C	No	Riffle-Pool	None	Gravel	High	Low	Low	Multiple	Low
R13.S1.02-S1.02	C	Yes	Riffle-Pool	None	Gravel	Low	Low	Low	Bridge	Low
S1.01	C	No	Riffle-Pool	b	Cobble			Unk.		Unk.
S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.
R13.S1.02-S1.03	C	No	Riffle-Pool	None	Gravel	Low	Low	Low	Bridge	Low
S1.01	C	No	Riffle-Pool	b	Gravel			Unk.		Unk.
S1.02	A	No	Step-Pool	None	Cobble			Unk.		Unk.
R13.S1.02-S1.04	C	No	Riffle-Pool	None	Gravel	Low	Low	Low	Bridge	Low
R13.S1.02-S1.05	C	No	Riffle-Pool	None	Gravel	None	No Data	N.S.	Bridge	Low
R13.S1.02-S1.06	C	No	Riffle-Pool	b	Gravel	None	No Data	N.S.	None	N.S.
R13.S1.02-S1.07	B	No	Step-Pool	None	Cobble	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
S1.01	A	No	Step-Pool	None	Cobble			Unk.		Unk.
S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.
R13.S1.02-S1.08	B	No	Step-Pool	None	Cobble	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.

Phase 1 - Step 7. Bed and Bank Windshield Survey

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.11 Stream Type					7.1 Bank Erosion - Bank Height			7.2 Ice & Debris Jam Potential	
Reach ID	Reference Stream Type	Mod. Ref. Stream Type	Dominant Bedform	Subclass Slope	Dominant Bed Material	Bank Erosion	Bank Height	Impact	Type	Impact
R13.S1.02-S1.09	C	No	Riffle-Pool	b	Gravel	None	No Data	N.S.	None	N.S.
R13.S1.02-S1.10	A	No	Cascade	a	Boulder	None	No Data	N.S.	None	N.S.
R13.S1.03	C	No	Riffle-Pool	None	Gravel	None	No Data	N.S.	Bridge	Low
R13.S1.04	B	No	Step-Pool	a	Cobble	Not Evaluated	Not Evaluated	N.D.	Not Evaluated	N.D.
R13.S1.05	B	No	Step-Pool	a	Cobble	None	No Data	N.S.	Culvert	Low
R13.S1.06	A	No	Cascade	a	Boulder	None	No Data	N.S.	None	N.S.
R13.S2.01	C	No	Riffle-Pool	None	Gravel	None	No Data	Low	Multiple	Low
R13.S2.01-S1.01	C	No	Riffle-Pool	None	Gravel			Unk.		Unk.
R13.S2.01-S1.02	C	No	Riffle-Pool	b	Cobble			Unk.		Unk.
R13.S2.01-S1.03	A	No	Step-Pool	None	Boulder			Unk.		Unk.
R13.S2.02	C	No	Riffle-Pool	b	Cobble	Low	Medium	Low	Culvert	Low
R13.S2.03	C	No	Riffle-Pool	b	Gravel	None	No Data	N.S.	Culvert	Low
R13.S2.04	A	No	Step-Pool	None	Boulder	None	No Data	N.S.	None	N.S.
R13.S2.04-S1.01	B	No	Step-Pool	a	Boulder			Unk.		Unk.
R13.S2.04-S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.
R13.S2.05	A	No	Cascade	a	Boulder	None	No Data	N.S.	Culvert	Low
R14	B	No	Riffle-Pool	c	Gravel	Low	High	Low	Shallow	Low
R15	B	No	Riffle-Pool	c	Gravel	None	No Data	Low	Multiple	Low
R16	C	No	Riffle-Pool	None	Gravel	Low	Low	Low	Multiple	Low
R16.S1.01	C	No	Riffle-Pool	None	Gravel	Low	High	High	Multiple	High
R16.S1.02	B	No	Step-Pool	a	Cobble	Low	High	Low	None	N.S.
R16.S1.03	C	No	Riffle-Pool	None	Cobble	Low	High	High	Bridge	Low
R16.S1.03-S1.01	B	No	Step-Pool	None	Cobble			Unk.		Unk.
R16.S1.03-S1.02	A	No	Cascade	a	Boulder			Unk.		Unk.

Phase 1 - Step 7. Bed and Bank Windshield Survey

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

Step	2.11 Stream Type					7.1 Bank Erosion - Bank Height			7.2 Ice & Debris Jam Potential	
Reach ID	Reference Stream Type	Mod. Ref. Stream Type	Dominant Bedform	Subclass Slope	Dominant Bed Material	Bank Erosion	Bank Height	Impact	Type	Impact
R16.S1.04	C	No	Riffle-Pool	None	Gravel	Low	Low	High	None	N.S.
R16.S1.05	B	No	Plane Bed	None	Cobble	Low	High	High	None	N.S.
R16.S1.06	C	No	Riffle-Pool	b	Gravel	None	No Data	Low	None	N.S.
R16.S1.07	C	No	Riffle-Pool	b	Cobble	None	No Data	N.S.	None	N.S.
R16.S1.08	A	No	Cascade	None	Boulder	None	No Data	N.S.	None	N.S.
R16.S2.01	C	No	Riffle-Pool	None	Gravel	Low	Low	Low	Multiple	Low
R16.S2.02	B	No	Plane Bed	None	Cobble	None	No Data	Low	Shallow	Low
R16.S2.02-S1.01	B	No	Step-Pool	a	Cobble			Unk.		Unk.
R16.S2.02-S1.02	A	No	Step-Pool	None	Boulder			Unk.		Unk.
R16.S2.03	C	No	Riffle-Pool	b	Gravel	None	No Data	N.S.	None	N.S.
R16.S2.03-S1.01	B	No	Plane Bed	c	Cobble			Unk.		Unk.
R16.S2.03-S1.02	B	No	Step-Pool	None	Cobble			Unk.		Unk.
R16.S2.03-S1.03	B	No	Step-Pool	a	Cobble			Unk.		Unk.
R16.S2.04	A	No	Cascade	None	Boulder	Low	Low	Low	Culvert	Low
T1.01	A	No	Cascade	a	Boulder	None	No Data	N.D.	No Data	N.D.

Phase 1 - Step 8. Summary of Categorical Impacts

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

		Stream Type					Step 4	Step 5	Step 6	Step 7
Reach ID	Stream or Tributary	Stream Type	Bed Material	Subclass Slope	Bedform	Total (out of 32)	Land Use (out of 6)	Instream Modification (out of 10)	Floodplain Modification (out of 12)	Bed & Bank Survey (out of 4)
M02.01	Little River	C	Gravel	None	Riffle-Pool	18	4	5	8	1
M02.02	Little River	C	Gravel	None	Riffle-Pool	13	3	2	7	1
M02.03	Little River	B	Gravel	c	Plane Bed	6	3	0	2	1
M02.04	Little River	C	Gravel	None	Riffle-Pool	13	3	3	6	1
R07	Winooski River	C	Sand	None	Riffle-Pool	18	4	4	7	3
R08	Winooski River	C	Gravel	None	Riffle-Pool	25	4	5	12	4
R09	Winooski River	C	Gravel	None	Riffle-Pool	24	4	4	12	4
R09.S1.01	Snipe Island Brook	C	Gravel	None	Riffle-Pool	20	4	7	7	2
R09.S1.02	Snipe Island Brook	B	Boulder	None	Step-Pool	11	4	2	3	2
R09.S1.03	Snipe Island Brook	C	Gravel	None	Riffle-Pool	9	3	2	4	0
R09.S1.03-S1.01	Unnamed Tributary	C	Gravel	b	Riffle-Pool	3	3	0	0	0
R09.S1.03-S1.01-S1.01	Unnamed Tributary	A	Boulder	None	Cascade	2	2	0	0	0
R09.S1.03-S1.02	Unnamed Tributary	E	Gravel	None	Riffle-Pool	0	0	0	0	0
R09.S1.03-S1.03	Unnamed Tributary	A	Boulder	None	Cascade	0	0	0	0	0
R09.S1.04	Snipe Island Brook	C	Gravel	None	Riffle-Pool	5	1	1	1	2
R09.S1.04-S1.01	Unnamed Tributary	B	Cobble	a	Step-Pool	2	2	0	0	0
R09.S1.05	Snipe Island Brook	B	Cobble	None	Step-Pool	0	0	0	0	0
R10	Winooski River	C	Gravel	c	Riffle-Pool	24	4	6	11	3
R10.S1.01	Duck Brook	C	Cobble	b	Riffle-Pool	13	3	4	5	1
R10.S1.02	Duck Brook	A	Bedrock	a	Cascade	1	1	0	0	0
R10.S1.02-S1.01	Unnamed Tributary	A	Bedrock	a	Cascade	0	0	0	0	0
R10.S1.03	Duck Brook	B	Cobble	a	Step-Pool	1	1	0	0	0
R10.S1.03-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R10.S1.04	Duck Brook	B	Cobble	None	Step-Pool	2	1	1	0	0
R10.S1.05	Duck Brook	E	Gravel	None	Riffle-Pool	1	1	0	0	0
R10.S1.06	Duck Brook	C	Gravel	None	Riffle-Pool	4	1	0	3	0
R10.S1.07	Duck Brook	C	Gravel	None	Riffle-Pool	3	1	0	2	0

Phase 1 - Step 8. Stream and Watershed Impact Rating

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type				Confinement	Watershed	Step Number with Impact Score																Total
	Stream	Bed	Subclass		Type	Area	| 0 = Not Significant or No Data | 1 = Low | 2 = High |															
Reach ID	Type	Material	Slope	Bed Feature			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	Score
M02.01	C	Gravel	None	Riffle-Pool	BD	112	1	2	1	0	2	1	2	0	2	2	1	0	2	1	1	0	18
M02.02	C	Gravel	None	Riffle-Pool	BD	111.8	1	2	0	0	0	0	2	0	2	0	1	0	2	2	1	0	13
M02.03	B	Gravel	c	Plane Bed	NC	111.2	1	2	0	0	0	0	0	0	2	0	0	0	0	0	1	0	6
M02.04	C	Gravel	None	Riffle-Pool	BD	109.7	1	2	0	0	1	0	2	0	2	0	0	0	2	2	1	0	13
R07	C	Sand	None	Riffle-Pool	VB	992.7	2	2	0	0	1	0	1	2	2	2	1	2	0	0	2	1	18
R08	C	Gravel	None	Riffle-Pool	VB	961.5	2	2	0	0	2	1	2	0	2	2	2	2	2	2	2	2	25
R09	C	Gravel	None	Riffle-Pool	BD	944.2	1	2	1	0	0	0	2	2	2	2	2	2	2	2	2	2	24
R09.S1.01	C	Gravel	None	Riffle-Pool	VB	5.4	1	2	1	0	2	1	2	2	2	2	0	0	2	1	1	1	20
R09.S1.02	B	Boulder	None	Step-Pool	NC	5.1	1	2	1	0	1	0	1	0	2	1	0	0	0	0	1	1	11
R09.S1.03	C	Gravel	None	Riffle-Pool	NW	4.2	1	1	1	0	0	0	2	0	0	0	0	0	2	2	0	0	9
R09.S1.03-S1.01	C	Gravel	b	Riffle-Pool	VB	1.6	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R09.S1.03-S1.01-S1.01	A	Boulder	None	Cascade	NC	0.7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R09.S1.03-S1.02	E	Gravel	None	Riffle-Pool	VB	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R09.S1.03-S1.03	A	Boulder	None	Cascade	NC	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R09.S1.04	C	Gravel	None	Riffle-Pool	VB	2.5	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	5
R09.S1.04-S1.01	B	Cobble	a	Step-Pool	SC	1.6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R09.S1.05	B	Cobble	None	Step-Pool	SC	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10	C	Gravel	c	Riffle-Pool	NW	867.5	1	2	1	0	1	1	2	2	2	2	2	1	2	2	1	2	24
R10.S1.01	C	Cobble	b	Riffle-Pool	VB	3.4	1	2	0	0	2	1	1	0	1	1	0	1	0	2	0	1	13
R10.S1.02	A	Bedrock	a	Cascade	NC	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R10.S1.02-S1.01	A	Bedrock	a	Cascade	NC	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S1.03	B	Cobble	a	Step-Pool	SC	2.8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R10.S1.03-S1.01	A	Boulder	a	Cascade	NC	0.6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R10.S1.04	B	Cobble	None	Step-Pool	SC	2.2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
R10.S1.05	E	Gravel	None	Riffle-Pool	VB	1.4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R10.S1.06	C	Gravel	None	Riffle-Pool	NW	0.7	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	4
R10.S1.07	C	Gravel	None	Riffle-Pool	VB	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3
R10.S2.01	C	Gravel	b	Riffle-Pool	VB	6.4	1	2	0	0	1	0	2	0	2	1	0	0	2	2	1	0	14
R10.S2.01-S1.01	A	Boulder	a	Cascade	NC	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S2.02	A	Boulder	None	Cascade	NC	5.7	1	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5
R10.S2.02-S1.01	A	Boulder	a	Cascade	NC	0.3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R10.S2.03	B	Boulder	a	Step-Pool	SC	4.9	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	4
R10.S2.03-S1.01	A	Boulder	a	Cascade	NC	0.3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R10.S2.04	A	Boulder	None	Cascade	SC	2.8	0	2	0	0	2	0	0	0	2	0	0	0	0	0	0	0	6
R10.S2.04-S1.01	A	Boulder	a	Cascade	NC	0.3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R10.S2.05	B	Boulder	a	Step-Pool	SC	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S2.06	A	Boulder	a	Cascade	NC	1.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S3.01	C	Cobble	b	Riffle-Pool	VB	9.3	1	2	0	0	2	2	2	0	2	2	0	0	2	2	2	1	20
R10.S3.02	B	Cobble	a	Step-Pool	SC	9.2	0	2	0	0	0	0	0	0	1	0	0	0	0	0	1	1	5
R10.S3.02-S1.01	A	Boulder	a	Cascade	NC	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S3.03	B	Cobble	a	Step-Pool	SC	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S3.03-S1.01	A	Boulder	a	Cascade	NC	0.7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R10.S3.04	B	Cobble	a	Step-Pool	SC	6.2	1	0	0	2	1	0	0	0	0	0	0	1	0	0	2	1	8
R10.S3.04-S1.01	A	Boulder	a	Cascade	NC	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S3.05	A	Boulder	None	Cascade	NC	4.6	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3

Phase 1 - Step 8. Stream and Watershed Impact Rating

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type				Confinement	Watershed	Step Number with Impact Score																Total
	Stream	Bed	Subclass		Type	Area	| 0 = Not Significant or No Data | 1 = Low | 2 = High |															
Reach ID	Type	Material	Slope	Bed Feature			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	Score
R10.S3.05-S1.01	A	Boulder	a	Cascade	NC	0.9	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R10.S3.05-S1.01-S1.01	A	Boulder	a	Cascade	NC	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S3.05-S1.02	A	Boulder	a	Cascade	NC	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S3.06	A	Boulder	None	Cascade	NC	3.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R10.S3.07	A	Boulder	a	Cascade	NC	1.7	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
R10.S4.01	B	Cobble	a	Step-Pool	VB	2.6	0	2	0	0	2	2	2	0	2	2	0	0	0	0	0	1	13
R10.S4.02	A	Boulder	a	Cascade	NC	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S4.02-S1.01	A	Bedrock	a	Cascade	NC	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S4.03	A	Boulder	a	Cascade	NC	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S4.03-S1.01	A	Boulder	a	Cascade	NC	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.S4.04	A	Bedrock	a	Cascade	NC	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R11	C	Gravel	None	Riffle-Pool	NW	842	1	2	0	2	1	0	2	0	2	2	2	1	2	2	1	2	22
R11.S1.01	B	Cobble	None	Plane Bed	SC	12.9	1	2	0	0	2	2	0	0	0	1	0	0	0	0	1	1	10
R11.S1.02	A	Cobble	None	Step-Pool	NC	12.7	1	2	0	0	1	0	0	0	2	1	0	0	0	0	0	0	7
R11.S1.03	B	Boulder	None	Step-Pool	SC	11.7	1	2	0	0	1	0	0	0	2	0	0	0	0	0	0	1	7
R11.S1.03-S1.01	A	Boulder	a	Cascade	NC	1.1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R11.S1.04	B	Cobble	a	Step-Pool	SC	10.2	0	2	0	0	2	1	0	0	2	1	0	0	0	0	0	0	8
R11.S1.04-S1.01	A	Boulder	a	Cascade	NC	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R11.S1.05	A	Cobble	None	Step-Pool	NC	7.7	0	2	0	0	1	1	0	0	2	0	0	0	0	0	0	2	8
R11.S1.05-S1.01	A	Boulder	a	Cascade	NC	0.8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R11.S1.05-S1.02	A	Boulder	a	Cascade	NC	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R11.S1.06	B	Boulder	a	Step-Pool	SC	6.5	1	2	1	0	1	0	0	0	2	0	0	0	0	0	0	1	8
R11.S1.06-S1.01	B	Boulder	a	Step-Pool	SC	3.7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R11.S1.06-S1.01-S1.01	A	Boulder	a	Cascade	NC	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R11.S1.06-S1.02	A	Boulder	a	Cascade	NC	2.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R11.S1.07	B	Boulder	a	Step-Pool	SC	1.5	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4
R11.S1.08	A	Boulder	a	Cascade	NC	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R12	C	Gravel	None	Riffle-Pool	NW	820.4	1	2	1	0	0	0	2	0	2	2	1	2	2	2	1	0	18
R13	C	Gravel	None	Riffle-Pool	BD	703.8	2	2	1	0	2	1	2	0	2	2	2	1	2	2	2	1	24
R13.S1.01	C	Gravel	None	Riffle-Pool	VB	19	2	2	1	0	2	2	2	0	2	2	0	1	2	2	1	1	22
R13.S1.02	B	Cobble	None	Step-Pool	SC	18.2	2	2	0	0	1	1	0	0	2	2	0	0	0	0	0	0	10
R13.S1.02-S1.01	C	Gravel	None	Riffle-Pool	BD	15.3	2	2	1	1	1	0	0	0	2	1	0	2	1	2	1	1	17
R13.S1.02-S1.02	C	Gravel	None	Riffle-Pool	VB	13.5	2	2	1	0	1	0	0	0	1	0	1	1	2	2	1	1	15
R13.S1.02-S1.02-S1.01	C	Cobble	b	Riffle-Pool	NW	2.8	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
R13.S1.02-S1.02-S1.02	A	Boulder	a	Cascade	NC	1.4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R13.S1.02-S1.03	C	Gravel	None	Riffle-Pool	VB	10.3	2	2	1	0	1	0	2	2	2	0	2	2	2	2	1	1	22
R13.S1.02-S1.03-S1.01	C	Gravel	b	Riffle-Pool	NW	2.2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
R13.S1.02-S1.03-S1.02	A	Cobble	None	Step-Pool	NC	1.8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R13.S1.02-S1.04	C	Gravel	None	Riffle-Pool	VB	7.9	2	2	1	0	1	0	0	0	1	2	2	2	0	1	1	1	16
R13.S1.02-S1.05	C	Gravel	None	Riffle-Pool	VB	7.3	1	2	0	0	1	0	2	2	0	0	0	2	2	2	0	1	15
R13.S1.02-S1.06	C	Gravel	b	Riffle-Pool	VB	6.2	1	2	0	0	0	0	2	2	1	0	0	0	2	2	0	0	12
R13.S1.02-S1.07	B	Cobble	None	Step-Pool	SC	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R13.S1.02-S1.07-S1.01	A	Cobble	None	Step-Pool	NC	1.8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R13.S1.02-S1.07-S1.02	A	Boulder	a	Cascade	NC	0.9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R13.S1.02-S1.08	B	Cobble	None	Step-Pool	SC	3.8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Phase 1 - Step 8. Stream and Watershed Impact Rating

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type				Confinement	Watershed	Step Number with Impact Score															
	Stream	Bed	Subclass		Type	Area	| 0 = Not Significant or No Data | 1 = Low | 2 = High |															Total
Reach ID	Type	Material	Slope	Bed Feature			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	Score
R13.S1.02-S1.09	C	Gravel	b	Riffle-Pool	NW	2.8	1	1	0	0	1	0	2	0	1	0	0	0	2	2	0	0	10
R13.S1.02-S1.10	A	Boulder	a	Cascade	NC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R13.S1.03	C	Gravel	None	Riffle-Pool	VB	2.7	2	2	0	0	1	0	0	0	0	1	0	1	1	1	0	1	10
R13.S1.04	B	Cobble	a	Step-Pool	SC	1.7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R13.S1.05	B	Cobble	a	Step-Pool	NW	1	2	2	0	0	1	0	0	0	1	0	0	0	0	0	0	1	7
R13.S1.06	A	Boulder	a	Cascade	NC	0.5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
R13.S2.01	C	Gravel	None	Riffle-Pool	VB	8.7	1	2	0	0	1	0	2	0	0	1	0	1	2	2	1	1	14
R13.S2.01-S1.01	C	Gravel	None	Riffle-Pool	VB	2.8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R13.S2.01-S1.02	C	Cobble	b	Riffle-Pool	VB	1.5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
R13.S2.01-S1.03	A	Boulder	None	Step-Pool	NC	0.7	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R13.S2.02	C	Cobble	b	Riffle-Pool	VB	5.1	1	2	0	1	1	0	2	0	1	1	0	1	2	2	1	1	16
R13.S2.03	C	Gravel	b	Riffle-Pool	VB	4.9	1	2	0	0	1	0	0	0	1	2	0	1	1	0	0	1	10
R13.S2.04	A	Boulder	None	Step-Pool	NC	4.5	1	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5
R13.S2.04-S1.01	B	Boulder	a	Step-Pool	SC	3.3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R13.S2.04-S1.02	A	Boulder	a	Cascade	NC	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
R13.S2.05	A	Boulder	a	Cascade	NC	1.1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	4
R14	B	Gravel	c	Riffle-Pool	SC	670.8	2	2	1	0	1	0	1	1	2	2	2	0	0	0	1	1	16
R15	B	Gravel	c	Riffle-Pool	SC	663.6	2	2	0	2	0	0	0	0	2	2	1	0	0	0	1	1	13
R16	C	Gravel	None	Riffle-Pool	BD	518.6	2	2	1	0	1	0	2	2	2	2	1	1	2	2	1	1	22
R16.S1.01	C	Gravel	None	Riffle-Pool	VB	8.8	2	2	0	0	2	2	2	0	0	2	0	0	2	2	2	2	20
R16.S1.02	B	Cobble	a	Step-Pool	SC	8.7	2	2	0	0	0	0	0	0	2	1	0	0	0	0	1	0	8
R16.S1.03	C	Cobble	None	Riffle-Pool	VB	8.5	2	2	0	0	1	0	2	0	2	1	1	1	2	2	2	1	19
R16.S1.03-S1.01	B	Cobble	None	Step-Pool	NC	1.9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
R16.S1.03-S1.02	A	Boulder	a	Cascade	NC	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R16.S1.04	C	Gravel	None	Riffle-Pool	NW	5.5	2	2	0	0	0	0	2	0	2	1	0	0	2	2	2	0	15
R16.S1.05	B	Cobble	None	Plane Bed	SC	5	2	2	1	0	1	0	0	0	2	1	0	0	0	0	2	0	11
R16.S1.06	C	Gravel	b	Riffle-Pool	NW	2.9	2	2	0	0	1	0	0	0	2	0	0	0	0	2	1	0	10
R16.S1.07	C	Cobble	b	Riffle-Pool	NW	1.5	2	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	6
R16.S1.08	A	Boulder	None	Cascade	NC	0.4	2	2	1	0	1	0	0	0	2	0	0	0	0	0	0	0	8
R16.S2.01	C	Gravel	None	Riffle-Pool	VB	10.1	1	2	1	0	1	0	2	0	0	1	0	1	2	2	1	1	15
R16.S2.02	B	Cobble	None	Plane Bed	SC	9.5	1	2	0	0	0	0	0	0	2	2	0	0	0	0	1	1	9
R16.S2.02-S1.01	B	Cobble	a	Step-Pool	SC	2.1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R16.S2.02-S1.02	A	Boulder	None	Step-Pool	NC	0.9	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R16.S2.03	C	Gravel	b	Riffle-Pool	NW	6.5	1	2	0	0	0	1	2	1	2	1	0	0	2	2	0	0	14
R16.S2.03-S1.01	B	Cobble	c	Plane Bed	SC	4.4	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R16.S2.03-S1.02	B	Cobble	None	Step-Pool	SC	2.7	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R16.S2.03-S1.03	B	Cobble	a	Step-Pool	SC	1.3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
R16.S2.04	A	Boulder	None	Cascade	NC	1.5	1	2	0	0	1	0	1	1	1	1	0	0	0	0	1	1	10
T1.01	A	Boulder	a	Cascade	NC	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

Phase 1 - Step 8. Summary of Categorical Impacts

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

		Stream Type					Step 4	Step 5	Step 6	Step 7
Reach ID	Stream or Tributary	Stream Type	Bed Material	Subclass Slope	Bedform	Total (out of 32)	Land Use (out of 6)	Instream Modification (out of 10)	Floodplain Modification (out of 12)	Bed & Bank Survey (out of 4)
R10.S2.01	Preston Brook	C	Gravel	b	Riffle-Pool	14	3	3	7	1
R10.S2.01-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R10.S2.02	Preston Brook	A	Boulder	None	Cascade	5	3	0	2	0
R10.S2.02-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R10.S2.03	Preston Brook	B	Boulder	a	Step-Pool	4	2	1	1	0
R10.S2.03-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R10.S2.04	Preston Brook	A	Boulder	None	Cascade	6	2	2	2	0
R10.S2.04-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R10.S2.05	Preston Brook	B	Boulder	a	Step-Pool	0	0	0	0	0
R10.S2.06	Preston Brook	A	Boulder	a	Cascade	0	0	0	0	0
R10.S3.01	Joiner Brook	C	Cobble	b	Riffle-Pool	20	3	6	8	3
R10.S3.02	Joiner Brook	B	Cobble	a	Step-Pool	5	2	0	1	2
R10.S3.02-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R10.S3.03	Joiner Brook	B	Cobble	a	Step-Pool	0	0	0	0	0
R10.S3.03-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	1	1	0	0	0
R10.S3.04	Joiner Brook	B	Cobble	a	Step-Pool	8	1	3	1	3
R10.S3.04-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R10.S3.05	Joiner Brook	A	Boulder	None	Cascade	3	2	1	0	0
R10.S3.05-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R10.S3.05-S1.01-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R10.S3.05-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R10.S3.06	Joiner Brook	A	Boulder	None	Cascade	1	1	0	0	0
R10.S3.07	Joiner Brook	A	Boulder	a	Cascade	2	1	1	0	0
R10.S4.01	Gleason Brook	B	Cobble	a	Step-Pool	13	2	6	4	1
R10.S4.02	Gleason Brook	A	Boulder	a	Cascade	0	0	0	0	0
R10.S4.02-S1.01	Unnamed Tributary	A	Bedrock	a	Cascade	0	0	0	0	0
R10.S4.03	Gleason Brook	A	Boulder	a	Cascade	0	0	0	0	0
R10.S4.03-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0

Phase 1 - Step 8. Summary of Categorical Impacts

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

		Stream Type					Step 4	Step 5	Step 6	Step 7
Reach ID	Stream or Tributary	Stream Type	Bed Material	Subclass Slope	Bedform	Total (out of 32)	Land Use (out of 6)	Instream Modification (out of 10)	Floodplain Modification (out of 12)	Bed & Bank Survey (out of 4)
R10.S4.04	Gleason Brook	A	Bedrock	a	Cascade	0	0	0	0	0
R11	Winooski River	C	Gravel	None	Riffle-Pool	22	3	5	11	3
R11.S1.01	Ridley Brook	B	Cobble	None	Plane Bed	10	3	4	1	2
R11.S1.02	Ridley Brook	A	Cobble	None	Step-Pool	7	3	1	3	0
R11.S1.03	Ridley Brook	B	Boulder	None	Step-Pool	7	3	1	2	1
R11.S1.03-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R11.S1.04	Ridley Brook	B	Cobble	a	Step-Pool	8	2	3	3	0
R11.S1.04-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R11.S1.05	Ridley Brook	A	Cobble	None	Step-Pool	8	2	2	2	2
R11.S1.05-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R11.S1.05-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R11.S1.06	Ridley Brook	B	Boulder	a	Step-Pool	8	4	1	2	1
R11.S1.06-S1.01	Unnamed Tributary	B	Boulder	a	Step-Pool	2	2	0	0	0
R11.S1.06-S1.01-S1.01	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R11.S1.06-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	1	1	0	0	0
R11.S1.07	Ridley Brook	B	Boulder	a	Step-Pool	4	2	0	2	0
R11.S1.08	Ridley Brook	A	Boulder	a	Cascade	0	0	0	0	0
R12	Winooski River	C	Gravel	None	Riffle-Pool	18	4	2	11	1
R13	Winooski River	C	Gravel	None	Riffle-Pool	24	5	5	11	3
R13.S1.01	Graves Brook	C	Gravel	None	Riffle-Pool	22	5	6	9	2
R13.S1.02	Graves Brook	B	Cobble	None	Step-Pool	10	4	2	4	0
R13.S1.02-S1.01	Thatcher Brook	C	Gravel	None	Riffle-Pool	17	5	2	8	2
R13.S1.02-S1.02	Thatcher Brook	C	Gravel	None	Riffle-Pool	15	5	1	7	2
R13.S1.02-S1.02-S1.01	Unnamed Tributary	C	Cobble	b	Riffle-Pool	4	4	0	0	0
R13.S1.02-S1.02-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	2	2	0	0	0
R13.S1.02-S1.03	Thatcher Brook	C	Gravel	None	Riffle-Pool	22	5	5	10	2

Phase 1 - Step 8. Summary of Categorical Impacts

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

		Stream Type					Step 4	Step 5	Step 6	Step 7
Reach ID	Stream or Tributary	Stream Type	Bed Material	Subclass Slope	Bedform	Total (out of 32)	Land Use (out of 6)	Instream Modification (out of 10)	Floodplain Modification (out of 12)	Bed & Bank Survey (out of 4)
R13.S1.02-S1.03-S1.01	Unnamed Tributary	C	Gravel	b	Riffle-Pool	4	4	0	0	0
R13.S1.02-S1.03-S1.02	Unnamed Tributary	A	Cobble	None	Step-Pool	3	3	0	0	0
R13.S1.02-S1.04	Thatcher Brook	C	Gravel	None	Riffle-Pool	16	5	1	8	2
R13.S1.02-S1.05	Thatcher Brook	C	Gravel	None	Riffle-Pool	15	3	5	6	1
R13.S1.02-S1.06	Thatcher Brook	C	Gravel	b	Riffle-Pool	12	3	4	5	0
R13.S1.02-S1.07	Thatcher Brook	B	Cobble	None	Step-Pool	1	1	0	0	0
R13.S1.02-S1.07-S1.01	Unnamed Tributary	A	Cobble	None	Step-Pool	1	1	0	0	0
R13.S1.02-S1.07-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	1	1	0	0	0
R13.S1.02-S1.08	Thatcher Brook	B	Cobble	None	Step-Pool	1	1	0	0	0
R13.S1.02-S1.09	Thatcher Brook	C	Gravel	b	Riffle-Pool	10	2	3	5	0
R13.S1.02-S1.10	Thatcher Brook	A	Boulder	a	Cascade	0	0	0	0	0
R13.S1.03	Graves Brook	C	Gravel	None	Riffle-Pool	10	4	1	4	1
R13.S1.04	Graves Brook	B	Cobble	a	Step-Pool	2	2	0	0	0
R13.S1.05	Graves Brook	B	Cobble	a	Step-Pool	7	4	1	1	1
R13.S1.06	Graves Brook	A	Boulder	a	Cascade	1	0	0	1	0
R13.S2.01	Crossett Brook	C	Gravel	None	Riffle-Pool	14	3	3	6	2
R13.S2.01-S1.01	Unnamed Tributary	C	Gravel	None	Riffle-Pool	1	1	0	0	0
R13.S2.01-S1.02	Unnamed Tributary	C	Cobble	b	Riffle-Pool	4	4	0	0	0
R13.S2.01-S1.03	Unnamed Tributary	A	Boulder	None	Step-Pool	3	3	0	0	0
R13.S2.02	Crossett Brook	C	Cobble	b	Riffle-Pool	16	3	4	7	2
R13.S2.03	Crossett Brook	C	Gravel	b	Riffle-Pool	10	3	1	5	1
R13.S2.04	Crossett Brook	A	Boulder	None	Step-Pool	5	3	0	2	0
R13.S2.04-S1.01	Unnamed Tributary	B	Boulder	a	Step-Pool	3	3	0	0	0
R13.S2.04-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	1	1	0	0	0
R13.S2.05	Crossett Brook	A	Boulder	a	Cascade	4	2	1	0	1
R14	Winooski River	B	Gravel	c	Riffle-Pool	16	5	3	6	2
R15	Winooski River	B	Gravel	c	Riffle-Pool	13	4	2	5	2

Phase 1 - Step 8. Summary of Categorical Impacts

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

		Stream Type					Step 4	Step 5	Step 6	Step 7
Reach ID	Stream or Tributary	Stream Type	Bed Material	Subclass Slope	Bedform	Total (out of 32)	Land Use (out of 6)	Instream Modification (out of 10)	Floodplain Modification (out of 12)	Bed & Bank Survey (out of 4)
R16	Winooski River	C	Gravel	None	Riffle-Pool	22	5	5	10	2
R16.S1.01	Great Brook	C	Gravel	None	Riffle-Pool	20	4	6	6	4
R16.S1.02	Great Brook	B	Cobble	a	Step-Pool	8	4	0	3	1
R16.S1.03	Great Brook	C	Cobble	None	Riffle-Pool	19	4	3	9	3
R16.S1.03-S1.01	Unnamed Tributary	B	Cobble	None	Step-Pool	2	2	0	0	0
R16.S1.03-S1.02	Unnamed Tributary	A	Boulder	a	Cascade	0	0	0	0	0
R16.S1.04	Great Brook	C	Gravel	None	Riffle-Pool	15	4	2	7	2
R16.S1.05	Great Brook	B	Cobble	None	Plane Bed	11	5	1	3	2
R16.S1.06	Great Brook	C	Gravel	b	Riffle-Pool	10	4	1	4	1
R16.S1.07	Great Brook	C	Cobble	b	Riffle-Pool	6	5	0	1	0
R16.S1.08	Great Brook	A	Boulder	None	Cascade	8	5	1	2	0
R16.S2.01	Jones Brook	C	Gravel	None	Riffle-Pool	15	4	3	6	2
R16.S2.02	Jones Brook	B	Cobble	None	Plane Bed	9	3	0	4	2
R16.S2.02-S1.01	Kelley Brook	B	Cobble	a	Step-Pool	3	3	0	0	0
R16.S2.02-S1.02	Kelley Brook	A	Boulder	None	Step-Pool	3	3	0	0	0
R16.S2.03	Jones Brook	C	Gravel	b	Riffle-Pool	14	3	4	7	0
R16.S2.03-S1.01	Herring Brook	B	Cobble	c	Plane Bed	3	3	0	0	0
R16.S2.03-S1.02	Herring Brook	B	Cobble	None	Step-Pool	3	3	0	0	0
R16.S2.03-S1.03	Herring Brook	B	Cobble	a	Step-Pool	3	3	0	0	0
R16.S2.04	Jones Brook	A	Boulder	None	Cascade	10	3	3	2	2
T1.01	Unnamed Tributary	A	Boulder	a	Cascade	1	0	1	0	0
					Total Scores	884	297	168	327	92
					Percent of Each Impact Category		33.60%	19.00%	37.00%	10.40%

Phase 1 - Step 9. Adjustment Process and Reach Condition

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type						9.1 Predicted Adjustment Scores					9.2 Reach Condition		9.3
Reach ID	Confinement Type	Stream Type	Bed Material	Subclass Slope	Subclass Bedform	Watershed Area	Total Impact	Degrad.	Aggrad.	Widen.	Planf.	Project	Statewide	Reach Sensitivity
M02.01	BD	C	Gravel	None	Riffle-Pool	112.04	18	10	8	3	9	Fair	Fair	High
M02.02	BD	C	Gravel	None	Riffle-Pool	111.79	13	6	5	3	5	Good	Good	High
M02.03	NC	B	Gravel	c	Plane Bed	111.16	6	4	3	0	0	Reference	Reference	Moderate
M02.04	BD	C	Gravel	None	Riffle-Pool	109.74	13	7	5	3	6	Fair	Good	High
R07	VB	C	Sand	None	Riffle-Pool	992.67	18	12	8	7	12	Poor	Fair	High
R08	VB	C	Gravel	None	Riffle-Pool	961.48	25	14	12	9	12	Poor	Fair	High
R09	BD	C	Gravel	None	Riffle-Pool	944.2	24	12	10	7	12	Poor	Fair	High
R09.S1.01	VB	C	Gravel	None	Riffle-Pool	5.38	20	12	8	3	11	Fair	Fair	High
R09.S1.02	NC	B	Boulder	None	Step-Pool	5.11	11	6	6	3	0	Good	Good	Very Low
R09.S1.03	NW	C	Gravel	None	Riffle-Pool	4.21	9	4	3	0	2	Good	Reference	High
R09.S1.03-S1.01	VB	C	Gravel	b	Riffle-Pool	1.64	3	2	3	0	0	Reference	Reference	High
R09.S1.03-S1.01-S1.01	NC	A	Boulder	None	Cascade	0.72	2	2	2	0	0	Reference	Reference	Very Low
R09.S1.03-S1.02	VB	E	Gravel	None	Riffle-Pool	0.86	0	2	0	0	0	Reference	Reference	High
R09.S1.03-S1.03	NC	A	Boulder	None	Cascade	0.46	0	2	0	0	0	Reference	Reference	Very Low
R09.S1.04	VB	C	Gravel	None	Riffle-Pool	2.49	5	3	3	0	1	Reference	Reference	High
R09.S1.04-S1.01	SC	B	Cobble	a	Step-Pool	1.6	2	2	2	0	0	Reference	Reference	Moderate
R09.S1.05	SC	B	Cobble	None	Step-Pool	0.83	0	2	0	0	0	Reference	Reference	Moderate
R10	NW	C	Gravel	c	Riffle-Pool	867.47	24	11	8	5	11	Fair	Fair	High
R10.S1.01	VB	C	Cobble	b	Riffle-Pool	3.45	13	5	7	3	6	Fair	Good	Moderate
R10.S1.02	NC	A	Bedrock	a	Cascade	3.03	1	2	1	0	0	Reference	Reference	Very Low
R10.S1.02-S1.01	NC	A	Bedrock	a	Cascade	0.13	0	2	0	0	0	Reference	Reference	Very Low
R10.S1.03	SC	B	Cobble	a	Step-Pool	2.81	1	2	1	0	0	Reference	Reference	Moderate
R10.S1.03-S1.01	NC	A	Boulder	a	Cascade	0.56	2	2	2	0	0	Reference	Reference	Very Low
R10.S1.04	SC	B	Cobble	None	Step-Pool	2.16	2	3	1	0	0	Reference	Reference	Moderate
R10.S1.05	VB	E	Gravel	None	Riffle-Pool	1.43	1	2	1	0	0	Reference	Reference	High
R10.S1.06	NW	C	Gravel	None	Riffle-Pool	0.7	4	2	1	0	0	Reference	Reference	High
R10.S1.07	VB	C	Gravel	None	Riffle-Pool	0.24	3	2	1	0	0	Reference	Reference	High
R10.S2.01	VB	C	Gravel	b	Riffle-Pool	6.38	14	7	5	3	6	Fair	Good	High
R10.S2.01-S1.01	NC	A	Boulder	a	Cascade	0.46	0	2	0	0	0	Reference	Reference	Very Low
R10.S2.02	NC	A	Boulder	None	Cascade	5.69	5	4	3	0	0	Reference	Reference	Very Low

Phase 1 - Step 9. Adjustment Process and Reach Condition

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type						9.1 Predicted Adjustment Scores					9.2 Reach Condition		9.3
Reach ID	Confinement Type	Stream Type	Bed Material	Subclass Slope	Subclass Bedform	Watershed Area	Total Impact	Degrad.	Aggrad.	Widen.	Planf.	Project	Statewide	Reach Sensitivity
R10.S2.02-S1.01	NC	A	Boulder	a	Cascade	0.28	2	2	2	0	0	Reference	Reference	Very Low
R10.S2.03	SC	B	Boulder	a	Step-Pool	4.9	4	3	2	0	0	Reference	Reference	Very Low
R10.S2.03-S1.01	NC	A	Boulder	a	Cascade	0.35	2	2	2	0	0	Reference	Reference	Very Low
R10.S2.04	SC	A	Boulder	None	Cascade	2.82	6	6	6	3	2	Good	Good	Very Low
R10.S2.04-S1.01	NC	A	Boulder	a	Cascade	0.28	2	2	2	0	0	Reference	Reference	Very Low
R10.S2.05	SC	B	Boulder	a	Step-Pool	2.35	0	2	0	0	0	Reference	Reference	Very Low
R10.S2.06	NC	A	Boulder	a	Cascade	1.57	0	2	0	0	0	Reference	Reference	Very Low
R10.S3.01	VB	C	Cobble	b	Riffle-Pool	9.28	20	14	9	5	12	Poor	Fair	Moderate
R10.S3.02	SC	B	Cobble	a	Step-Pool	9.16	5	2	2	0	0	Reference	Reference	Moderate
R10.S3.02-S1.01	NC	A	Boulder	a	Cascade	0.62	0	2	0	0	0	Reference	Reference	Very Low
R10.S3.03	SC	B	Cobble	a	Step-Pool	7.53	0	2	0	0	0	Reference	Reference	Moderate
R10.S3.03-S1.01	NC	A	Boulder	a	Cascade	0.68	1	2	1	0	0	Reference	Reference	Very Low
R10.S3.04	SC	B	Cobble	a	Step-Pool	6.22	8	7	7	7	4	Fair	Good	Moderate
R10.S3.04-S1.01	NC	A	Boulder	a	Cascade	0.88	0	2	0	0	0	Reference	Reference	Very Low
R10.S3.05	NC	A	Boulder	None	Cascade	4.63	3	3	2	0	0	Reference	Reference	Very Low
R10.S3.05-S1.01	NC	A	Boulder	a	Cascade	0.85	2	2	2	0	0	Reference	Reference	Very Low
R10.S3.05-S1.01-S1.01	NC	A	Boulder	a	Cascade	0.25	0	2	0	0	0	Reference	Reference	Very Low
R10.S3.05-S1.02	NC	A	Boulder	a	Cascade	0.48	0	2	0	0	0	Reference	Reference	Very Low
R10.S3.06	NC	A	Boulder	None	Cascade	3.19	1	2	1	0	0	Reference	Reference	Very Low
R10.S3.07	NC	A	Boulder	a	Cascade	1.72	2	3	1	0	0	Reference	Reference	Very Low
R10.S4.01	VB	B	Cobble	a	Step-Pool	2.62	13	12	6	3	11	Fair	Fair	Moderate
R10.S4.02	NC	A	Boulder	a	Cascade	2.59	0	2	0	0	0	Reference	Reference	Very Low
R10.S4.02-S1.01	NC	A	Bedrock	a	Cascade	0.16	0	2	0	0	0	Reference	Reference	Very Low
R10.S4.03	NC	A	Boulder	a	Cascade	1.97	0	2	0	0	0	Reference	Reference	Very Low
R10.S4.03-S1.01	NC	A	Boulder	a	Cascade	0.75	0	2	0	0	0	Reference	Reference	Very Low
R10.S4.04	NC	A	Bedrock	a	Cascade	0.75	0	2	0	0	0	Reference	Reference	Very Low
R11	NW	C	Gravel	None	Riffle-Pool	841.99	22	11	9	7	11	Poor	Fair	High
R11.S1.01	SC	B	Cobble	None	Plane Bed	12.89	10	6	7	3	4	Fair	Good	Moderate
R11.S1.02	NC	A	Cobble	None	Step-Pool	12.66	7	5	5	3	0	Good	Good	High
R11.S1.03	SC	B	Boulder	None	Step-Pool	11.7	7	5	5	3	1	Good	Good	Very Low

Phase 1 - Step 9. Adjustment Process and Reach Condition

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type						9.1 Predicted Adjustment Scores					9.2 Reach Condition		9.3
Reach ID	Confinement Type	Stream Type	Bed Material	Subclass Slope	Subclass Bedform	Watershed Area	Total Impact	Degrad.	Aggrad.	Widen.	Planf.	Project	Statewide	Reach Sensitivity
R11.S1.03-S1.01	NC	A	Boulder	a	Cascade	1.14	2	2	2	0	0	Reference	Reference	Very Low
R11.S1.04	SC	B	Cobble	a	Step-Pool	10.18	8	6	6	3	2	Good	Good	Moderate
R11.S1.04-S1.01	NC	A	Boulder	a	Cascade	1.49	0	2	0	0	0	Reference	Reference	Very Low
R11.S1.05	NC	A	Cobble	None	Step-Pool	7.65	8	5	6	3	0	Good	Good	High
R11.S1.05-S1.01	NC	A	Boulder	a	Cascade	0.82	2	2	2	0	0	Reference	Reference	Very Low
R11.S1.05-S1.02	NC	A	Boulder	a	Cascade	0.5	0	2	0	0	0	Reference	Reference	Very Low
R11.S1.06	SC	B	Boulder	a	Step-Pool	6.52	8	5	6	3	1	Good	Good	Very Low
R11.S1.06-S1.01	SC	B	Boulder	a	Step-Pool	3.7	2	2	2	0	0	Reference	Reference	Very Low
R11.S1.06-S1.01-S1.01	NC	A	Boulder	a	Cascade	1.09	0	2	0	0	0	Reference	Reference	Very Low
R11.S1.06-S1.02	NC	A	Boulder	a	Cascade	2.16	1	2	1	0	0	Reference	Reference	Very Low
R11.S1.07	SC	B	Boulder	a	Step-Pool	1.48	4	4	2	0	0	Reference	Reference	Very Low
R11.S1.08	NC	A	Boulder	a	Cascade	0.25	0	2	0	0	0	Reference	Reference	Very Low
R12	NW	C	Gravel	None	Riffle-Pool	820.37	18	8	6	3	9	Fair	Good	High
R13	BD	C	Gravel	None	Riffle-Pool	703.84	24	14	11	9	10	Poor	Fair	High
R13.S1.01	VB	C	Gravel	None	Riffle-Pool	19.04	22	14	9	5	12	Poor	Fair	High
R13.S1.02	SC	B	Cobble	None	Step-Pool	18.25	10	9	6	5	4	Fair	Good	Moderate
R13.S1.02-S1.01	BD	C	Gravel	None	Riffle-Pool	15.32	17	7	7	5	7	Fair	Good	High
R13.S1.02-S1.02	VB	C	Gravel	None	Riffle-Pool	13.53	15	5	7	5	5	Fair	Good	High
R13.S1.02-S1.02-S1.01	NW	C	Cobble	b	Riffle-Pool	2.81	4	4	4	2	0	Good	Reference	Moderate
R13.S1.02-S1.02-S1.02	NC	A	Boulder	a	Cascade	1.42	2	2	2	0	0	Reference	Reference	Very Low
R13.S1.02-S1.03	VB	C	Gravel	None	Riffle-Pool	10.32	22	11	7	7	11	Fair	Fair	High
R13.S1.02-S1.03-S1.01	NW	C	Gravel	b	Riffle-Pool	2.25	4	4	4	2	0	Good	Reference	High
R13.S1.02-S1.03-S1.02	NC	A	Cobble	None	Step-Pool	1.81	3	4	3	2	0	Good	Reference	High
R13.S1.02-S1.04	VB	C	Gravel	None	Riffle-Pool	7.88	16	5	7	7	9	Fair	Good	High
R13.S1.02-S1.05	VB	C	Gravel	None	Riffle-Pool	7.29	15	7	5	3	10	Fair	Good	High
R13.S1.02-S1.06	VB	C	Gravel	b	Riffle-Pool	6.21	12	6	5	3	7	Fair	Good	High
R13.S1.02-S1.07	SC	B	Cobble	None	Step-Pool	5.96	1	2	1	0	0	Reference	Reference	Moderate
R13.S1.02-S1.07-S1.01	NC	A	Cobble	None	Step-Pool	1.84	1	2	1	0	0	Reference	Reference	High
R13.S1.02-S1.07-S1.02	NC	A	Boulder	a	Cascade	0.86	1	2	1	0	0	Reference	Reference	Very Low
R13.S1.02-S1.08	SC	B	Cobble	None	Step-Pool	3.81	1	2	1	0	0	Reference	Reference	Moderate

Phase 1 - Step 9. Adjustment Process and Reach Condition

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type						9.1 Predicted Adjustment Scores					9.2 Reach Condition		9.3
Reach ID	Confinement Type	Stream Type	Bed Material	Subclass Slope	Subclass Bedform	Watershed Area	Total Impact	Degrad.	Aggrad.	Widen.	Planf.	Project	Statewide	Reach Sensitivity
R13.S1.02-S1.09	NW	C	Gravel	b	Riffle-Pool	2.83	10	5	4	2	5	Good	Good	High
R13.S1.02-S1.10	NC	A	Boulder	a	Cascade	1.02	0	2	0	0	0	Reference	Reference	Very Low
R13.S1.03	VB	C	Gravel	None	Riffle-Pool	2.72	10	4	4	2	1	Good	Reference	High
R13.S1.04	SC	B	Cobble	a	Step-Pool	1.68	2	4	2	2	0	Reference	Reference	Moderate
R13.S1.05	NW	B	Cobble	a	Step-Pool	1	7	5	6	5	5	Fair	Good	Moderate
R13.S1.06	NC	A	Boulder	a	Cascade	0.47	1	2	0	0	0	Reference	Reference	Very Low
R13.S2.01	VB	C	Gravel	None	Riffle-Pool	8.68	14	5	5	3	6	Good	Good	High
R13.S2.01-S1.01	VB	C	Gravel	None	Riffle-Pool	2.79	1	2	1	0	0	Reference	Reference	High
R13.S2.01-S1.02	VB	C	Cobble	b	Riffle-Pool	1.54	4	4	4	2	0	Good	Reference	Moderate
R13.S2.01-S1.03	NC	A	Boulder	None	Step-Pool	0.67	3	2	3	0	0	Reference	Reference	Very Low
R13.S2.02	VB	C	Cobble	b	Riffle-Pool	5.13	16	5	5	3	6	Good	Good	Moderate
R13.S2.03	VB	C	Gravel	b	Riffle-Pool	4.94	10	5	5	3	6	Good	Good	High
R13.S2.04	NC	A	Boulder	None	Step-Pool	4.52	5	4	3	0	0	Reference	Reference	Very Low
R13.S2.04-S1.01	SC	B	Boulder	a	Step-Pool	3.32	3	2	3	0	0	Reference	Reference	Very Low
R13.S2.04-S1.02	NC	A	Boulder	a	Cascade	0.95	1	2	1	0	0	Reference	Reference	Very Low
R13.S2.05	NC	A	Boulder	a	Cascade	1.09	4	3	2	0	0	Reference	Reference	Very Low
R14	SC	B	Gravel	c	Riffle-Pool	670.83	16	11	7	7	6	Fair	Fair	Moderate
R15	SC	B	Gravel	c	Riffle-Pool	663.6	13	10	8	7	5	Fair	Fair	Moderate
R16	BD	C	Gravel	None	Riffle-Pool	518.63	22	13	7	5	11	Fair	Fair	High
R16.S1.01	VB	C	Gravel	None	Riffle-Pool	8.8	20	14	12	7	12	Poor	Fair	High
R16.S1.02	SC	B	Cobble	a	Step-Pool	8.67	8	6	6	5	1	Good	Good	Moderate
R16.S1.03	VB	C	Cobble	None	Riffle-Pool	8.53	19	11	8	7	7	Fair	Fair	Moderate
R16.S1.03-S1.01	NC	B	Cobble	None	Step-Pool	1.91	2	2	2	0	0	Reference	Reference	Moderate
R16.S1.03-S1.02	NC	A	Boulder	a	Cascade	0.31	0	2	0	0	0	Reference	Reference	Very Low
R16.S1.04	NW	C	Gravel	None	Riffle-Pool	5.54	15	10	8	7	6	Fair	Fair	High
R16.S1.05	SC	B	Cobble	None	Plane Bed	4.98	11	9	9	7	2	Fair	Good	Moderate
R16.S1.06	NW	C	Gravel	b	Riffle-Pool	2.94	10	7	6	5	5	Fair	Good	High
R16.S1.07	NW	C	Cobble	b	Riffle-Pool	1.51	6	3	5	4	0	Good	Reference	Moderate
R16.S1.08	NC	A	Boulder	None	Cascade	0.38	8	7	7	5	0	Good	Good	Very Low
R16.S2.01	VB	C	Gravel	None	Riffle-Pool	10.07	15	5	6	3	6	Fair	Good	High

Phase 1 - Step 9. Adjustment Process and Reach Condition

Basin: **Winooski** Watershed: **Winooski River** Sub-watershed: **Winooski River -- Huntington River to mouth**

	Stream Type						9.1 Predicted Adjustment Scores					9.2 Reach Condition		9.3
Reach ID	Confinement Type	Stream Type	Bed Material	Subclass Slope	Subclass Bedform	Watershed Area	Total Impact	Degrad.	Aggrad.	Widen.	Planf.	Project	Statewide	Reach Sensitivity
R16.S2.02	SC	B	Cobble	None	Plane Bed	9.54	9	6	5	3	2	Good	Good	Moderate
R16.S2.02-S1.01	SC	B	Cobble	a	Step-Pool	2.11	3	2	3	0	0	Reference	Reference	Moderate
R16.S2.02-S1.02	NC	A	Boulder	None	Step-Pool	0.89	3	2	3	0	0	Reference	Reference	Very Low
R16.S2.03	NW	C	Gravel	b	Riffle-Pool	6.48	14	7	5	3	6	Fair	Good	High
R16.S2.03-S1.01	SC	B	Cobble	c	Plane Bed	4.42	3	2	3	0	0	Reference	Reference	Moderate
R16.S2.03-S1.02	SC	B	Cobble	None	Step-Pool	2.7	3	2	3	0	0	Reference	Reference	Moderate
R16.S2.03-S1.03	SC	B	Cobble	a	Step-Pool	1.31	3	2	3	0	0	Reference	Reference	Moderate
R16.S2.04	NC	A	Boulder	None	Cascade	1.51	10	5	5	3	0	Good	Good	Very Low
T1.01	NC	A	Boulder	a	Cascade	0.99	1	3	0	0	0	Reference	Reference	Very Low