Rock River Watershed
Stream Geomorphic Assessment
Phase 2 Report
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1.0 Executive Summary

The Rock River is located in Windham County, Vermont in the towns of Newfane, Marlboro, Dover and Wardsboro. It is part of the Connecticut River Basin, located in the southeast corner of the State. The Rock River main stem is 12 miles long and is made up of three branches of nearly equal size: the main stem, Baker Brook and the Marlboro Branch.

Twenty reaches were selected for Phase 2 Stream Geomorphic Assessment (SGA) following completion of the Phase 1 SGA. These reaches were selected based on Phase 1 Impact scores as well as potential conflicts with infrastructure. A total of 21 miles of river were assessed and divided into 25 segments.

A Phase 2 SGA field checks Phase 1 data and updates it where necessary, providing an understanding of reference conditions, departure from reference and likely causes for this departure from reference (disequilibrium). Reference condition is the state the river would be in without human impacts occurring in the watershed. It is based on the understanding that all streams, left un-managed, will find a width, slope and pattern that are self-maintaining and will provide for sediment and flood transport in equilibrium over the long term.

Due to the steep terrain and resulting narrow valleys, most of the streams in the watershed have roads along them, focusing development in the stream corridors. The combination of roads and development within the river corridor increases the volume of water that enters the channel. In addition to existing impacts, 30% percent of the Rock River assessed here, was historically straightened. When a river is straightened, the force of the water moving through it is increased, resulting in a downcutting of the river bed. The incised channel loses access to floodplain. Eventually, the banks fail and the river becomes over-widened, dissipating energy, and allowing sediment to build up again. As sediment accumulates, the channel narrows and the stream re-builds its floodplain at a lower elevation. The majority of the segments assessed are significantly over-widened and currently aggrading or undergoing planform adjustment (regaining sinuosity in response to historic straightening.)

This report recommends:

1. Focusing corridor conservation and restoration efforts on the few remaining reaches that do not have roads and houses in the corridor and still have access to floodplain. These reaches are: T2.04, T2.05A, T2.05-S1.02, T2.05-S1.04 and T2.07;
2. Focus on Taft Brook (T2.11-S1.01 segments A, B & C) and Baker Brook (T2.03-S2.02), two extremely sensitive headwater streams that have numerous undersized structures (Taft), and many storm water inputs, by working with landowners and towns to replace structures and implement Best Management Practices for storm water management;
3. Work with the towns of Newfane, Marlboro and Dover to establish Fluvial Erosion Hazard zones to prevent further development in areas most at risk for erosion; and
4. Provide town officials with a list of undersized structures and recommended replacement widths so that new structures are properly sized.

2.0 Project Overview

2.1 Project Partners

The Windham County Natural Resources Conservation District (WCNRCD), with funding from the Vermont Department of Environmental Conservation (DEC) River Management Section, hired Landslide Inc. to perform this Phase 2 Assessment. The Windham County Regional Planning Commission was also a partner in this project.

2.2 Description of Study Area

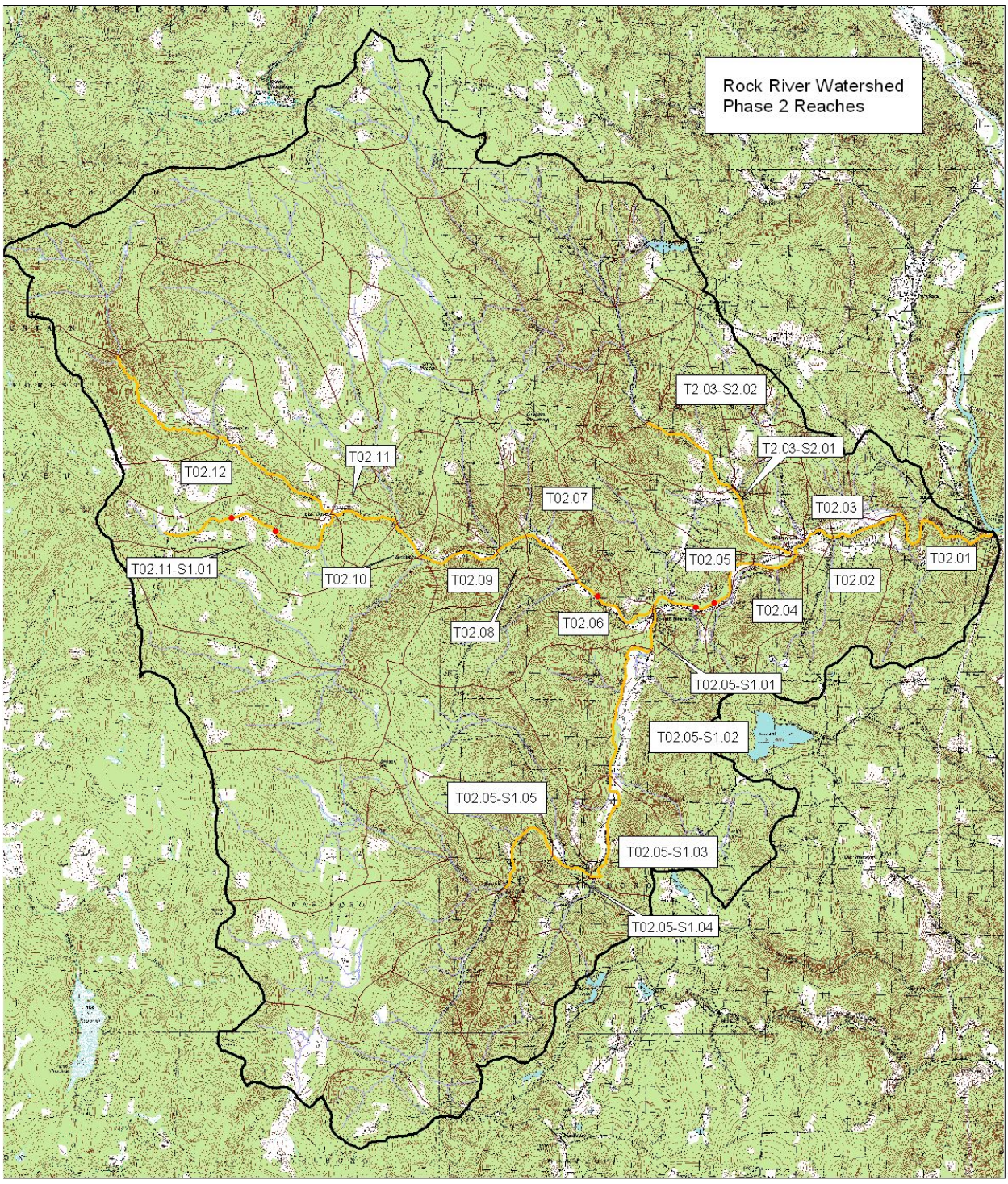
Twenty reaches were selected for Phase 2 Stream Geomorphic Assessment (SGA) following completion of the Phase 1 SGA. These reaches were selected based on Phase 1 Impact scores as well as sensitivity and potential conflicts with infrastructure. A total of 21 miles of river were assessed and were divided into 25 segments.

2.3 Goals and Objectives of the Project

A Phase 2 SGA field checks Phase 1 data and updates it where necessary, providing an understanding of reference conditions, departure from reference and likely causes for this departure from reference (disequilibrium). Reference condition is that state the river would be in without human impacts occurring in the watershed. It is based on the understanding that all streams, left un-managed, will find a width, slope and pattern that are self-maintaining and will provide for sediment and flood transport in equilibrium over the long term.

After analyzing reference and existing conditions, the study analyzes the degree of stream type departure and recommends and prioritizes potential restoration activities that can return the stream to equilibrium condition. In-stream habitat is assessed as well. Results of the Phase 2 Assessment can be used by interested organizations and agencies to work toward restoring equilibrium conditions in the watershed as opportunities arise. This plan is also intended to provide guidance for communities should money for restoration and conservation become available after a flood event.

2.4 Reach Locator Map



3.0 Background Information

3.1 Geographic Setting

The Rock River is located in Windham County, Vermont, in the towns of Newfane, Marlboro, Dover and Wardsboro. It is part of the Connecticut River Basin and is located in the southeast corner of the State. The watershed is 57 square miles or 36,871 acres. The Rock River main stem is 12 miles long and is made up of three branches of nearly equal size: the main stem, Baker Brook and the Marlboro Branch. Like much of the rest of the state, the watershed was cleared for timber and agriculture during the latter part of the 19th century, but today is primarily forested. Land use is currently 35 percent broad leaf forest, 26 percent coniferous forest, 21 percent mixed forest, 8 percent developed land (housing and roads), 4 percent crop lands and 5 percent water.

Two thirds of the watershed has steep topography but farther down in the watershed the valley broadens and some agriculture still occurs. Due to the steep terrain and resulting narrow valleys, most of the streams in the watershed have roads along them, focusing development in the stream corridors.

3.2 Geologic Setting

The Rock River watershed straddles the boundary between the Southern Vermont Piedmont and the Southern Green Mountain physiographic regions. Approximately one third of the watershed is in the Piedmont while the remaing two thirds is in the eastern Green Mountain. The Southern Vermont Piedmont is comprised of the eastern rolling foothills of the main Green Mountains. Much of the metamorphic and sedimentary rocks that were orignally here have eroded away, leaving a mixture of limestone, schist and granite. The Green Mountain region is primarily metamorphic rock in its schist form with some igneous mineral deposits along the eastern flanks. It is comprised mostly of "broad high plateau(s) with few prominent peaks" (Johnson, p. 24-30).

3.3 Geomorphic Setting

The Rock River watershed is naturally about one third A, B and C stream types (17, 21 and 19 square miles respectively). Phase 1 reference stream types are based on confinement, slope and sinuosity. A streams are in confined valleys, have gradients greater than 4%, are generally straight and have very little access to flood plain. B streams are still in confined valleys, though wider than A's and they have slopes between 2 and 4% with some meanders. C type streams are in unconfined valley settings with a slope of less than 2%; they consistently meander and have good access to floodplain. The Phase 2 study uses field measurements to determine both reference and current stream types.

3.4 Hydrology

None of the assessed reaches are impounded and there are no longer major dams in the Rock River watershed. In 1961 the U.S. Army Corps of Engineers dammed the West River upstream of the Rock River, in Townsend, Jamaica and Londonderry for flood control purposes. Most of the time, these dams are run of the river and are only regulated during high flow events. The nearest U.S. Geologic Survey gauging station is located on the West River in Jamaica, Vermont. In 1973 the Rock River, along with most of the State of Vermont, experienced a major flood

event. After this event, there was extensive dredging, berming and windrowing in an attempt to control channel location and reduce future flood impacts.

3.5 Ecological Setting

At the heart of the watershed, the Vermont Biodiversity Project (VBP) has identified a 3,331 acre "Complimentary Landscape", an area where a unique combination of elevation, bedrock and surficial geology and topography combine to create a uniquely diverse and as yet unprotected, type of the Vermont Landscape. This study also identified five occurrences of native vascular plants that are rare within the state (Thompson, p. 27& 29).

Due to the steep terrain and resulting limited areas for development, the VBP identified the majority of this watershed as "core habitat". Core habitat is defined as any area of forest with 100' of forested buffer surrounding it and is essential for upland wildlife species dependent upon relatively undisturbed areas.

4.0 Methods

4.1 Fluvial Geomorphic and Habitat Assessment Protocols

The State of Vermont has developed a three phase geomorphic based assessment protocol for watershed assessment. The first phase is considered the "remote sensing" level which evaluates geology, soils, slope, and watershed size to establish a provisional reference stream type for each reach. The Stream Geomorphic Assessment Tool Version 4.53 (SGAT), an ArcView extension, was used to facilitate the collection of data (Davis). The Phase 1 study also quantifies human impacts in the watershed and assigns a provisional impact rating to each reach.

The Phase 1 information helps set the stage for understanding what the major watershed impacts are and can assist in identifying areas to focus additional assessment resources. The Phase 2 Assessment includes the collection of field measurements and observations to check against the Phase 1 reference stream types and impact ratings. This information can be used to identify Fluvial Erosion Hazard (FEH) zones as well as for identification of areas for different types of restoration activities. Phase 3 assessments involve detailed surveys and are only completed on those reaches that will benefit from active stream restoration activities. All Phase 2 data is located in Appendix B.

4.2 Rapid Geomorphic Assessment (RGA)

The RGA is useful in evaluating current stream processes, departures from a reference condition, and stages of channel evolution for a given reach. Three separate RGA forms are used in the Phase II Assessment, one for unconfined streams, one for confined streams, and one for naturally occurring Plane-Bed streams. Parameters evaluated in the RGA are summarized as follows:

- Degree of channel degradation or incision;
- Degree of channel aggradation;
- Degree of channel widening;
- Change in channel planform.

Refer to the VT ANR Protocols for more on the RGA (VTANR, March 2006).

Once the RGA is completed and the current "condition" is rated, a stage of channel evolution is identified. One of two channel evolution models is used: either the F-stage model or the D-stage model.

In the F-stage model, a channel loses floodplain access by undergoing degradation due to a disturbance. This degradation is typically followed by channel widening (Stage III), then aggradation and planform adjustments (Stage IV), before then regaining stability with regard to its water and sediment loads (Stage V).

In the D-stage model, aggradation, widening, and planform changes are the main adjustment processes, with degradation being limited, sometimes by resistant bed material or grade controls. The D-stage process can include moderate entrenchment and loss of bed features (Stage IIb), channel widening (Stage IIc), bed aggradation, bar formation (Stage IId), and regaining a balance similar to reference condition (Stage III). Please refer to the VT ANR Protocol Appendix C for more information on channel evolution models (VTANR, March 2006).

Parameters for the RGA as well as a Rapid Habitat Assessment were scored and assigned to the correlating "condition" category describing departure from a reference condition and degree of adjustment (VTANR, April 2005) as follows:

- Reference – Reaches in dynamic equilibrium, having stream geomorphic processes and habitats found in mostly undisturbed streams.
- Good – Reaches having stream geomorphology or habitat that is slightly impacted by human or natural disturbance, showing signs of minor adjustment, but functioning for the most part.
- Fair – Reaches in moderate adjustment, having major changes in channel form, process or habitat.
- Poor – Reaches experiencing extreme adjustment or departure from their reference stream type or habitat condition.

In some cases, where a score lies at one end limit of a category, the condition category that best described the reach can be selected.

A Stream Sensitivity Rating is then generated for each reach or segment according to stream type and geomorphic condition. The range of sensitivity ratings includes: very low, low, moderate, high, very high and extreme. These indicate the sensitivity of a reach or segment to ongoing disturbance or stressors.

4.3 QA/QC Summary Report

To assure a high level of confidence in this Phase 2 Assessment, strict quality assurance and quality controls were followed. These procedures included both manual and automated reviews of all data by LNRP as well as by the Department of Environmental Conservation River Management Program. A copy of the QA/QC report is in Appendix D at the end of this document.

5.0 Reach By Reach Summary

5.1 Rock River

T2.01

This reach is located at the confluence of the Rock River and the West River in a naturally semi-confined valley. The reach is dominated by series of ledge outcrops that create deep pools with steep riffles in between them. It is both a Bc by reference and currently a Bc type channel although it is moderately entrenched and very incised. The right bank has an old road bed running along its entire length that is a public right of way that facilitates access by swimmers and is likely a recently abandoned floodplain feature. This road is found on the 1893 and 1935 USGS topographic maps but is not shown on the 1954 edition. There are six steep riffles at the up-stream end of the reach which may be related to the historic dam on T08.03. When it was removed it is likely a large amount of sediment was released, causing the previously sediment starved (and thus incised) river to now be aggrading. Reference channel width is 78' and current channel width is 115'.

There are two flood chutes, ten side bars and three large islands in the reach. There is one large area of erosion on the right bank at the upstream end that is 15' high and very active. The riparian corridor is dominated by forest land use, though camps and year round housing are encroaching at both the downstream and upstream ends. There is one bridge at the downstream end of the reach on Route 30 that is a floodplain constriction with deposition above, in and below it.

This reach is in "Fair" geomorphic condition, is highly sensitive and in channel evolution stage IV-F; aggrading with historic widening and degradation. The habitat condition was rated good.

Rock River Preservation Incorporated is working to raise money to purchase four acres of land along this reach from the Connecticut River Watershed Council to preserve it in perpetuity for public access.

This reach is a good candidate for corridor conservation due to the relatively undeveloped nature of the corridor, the intense public use of the water resource as well as its strategic location at the mouth of the Rock River.

T2.02

This reach is located downstream of the village of Williamsville in a semi-confined valley and it is naturally straight. There is a gravel town road along the entire right bank, which used to connect to the road in T2.01, and the left corridor is almost entirely mowed meadow though the stream bank is vegetated along both banks. There are no channel or floodplain constrictions and no grade controls that span the entire channel. However, there is ledge across the right channel in the upstream section of the reach where the stream accesses a left bank channel during high water. Reference channel width is 77' and current channel width is 96'.

T2.02 is a C plane bed stream type by reference but is currently an F plane bed channel type that is in stage IV of the F-stage channel evolution process. It is aggrading with historic degradation and widening and is in fair geomorphic condition. The habitat condition was rated good.

As this reach aggrades, consideration should be given to restoring access to floodplain on the left bank.

T2.03

This reach is in the village of Williamsville and has a popular public swimming area in the pools created by the channel spanning grade control. It is located in a narrowly confined valley that has been altered by human land use. There is a road the entire length of the left corridor with development along most of it. The reach is dominated by ledge with an over-widened section that has two parallel flood channels. Local residents report that the main flow has been in the left channel for at least the past 30 years and the river accesses both flood channels during high flow events. All of this is down stream of channel spanning grade control that had a wooden dam on it until it was "dismantled naturally after being declared unnecessary in the 1980's" (Phase 1 SGA Report). Reference channel width for this reach is 76' and it is currently 96'.

There is one bridge in this reach that is flood prone area constriction with deposition above and below it. The left bank is dominated by the Dover Road and village development while the right bank is relatively undeveloped.

T2.03 is an F stream type in stage IV of the F-stage channel evolution process. The Phase 1 assessment identified this as a C riffle pool stream type. It is extremely sensitive and is in fair geomorphic condition. The habitat was condition was rated good.

Passive river management is recommended for this reach that will naturally narrow and re-build its floodplain as it continues to adjust to the removal of the dam. Community outreach is recommended to help residents and swimmers understand the fluvial processes at work in their part of the river.

T2.04

This reach is just upstream of the village of Williamsville and it is located in a broadly confined valley. During the 1990's a dredging violation occurred in the reach. Tributary rejuvenation is occurring in two gullies along the right bank of this reach and there is one mass failure on the right bank at the downstream end. There is significant erosion on the left bank in the downstream portion of the reach. There is an old channel evident on the left bank. Reference channel width is 68' and current channel width is 82'.

There is one (covered) bridge at the upstream end of the reach that is a floodplain constriction. There is dogleg shaped channel on the left bank at the downstream end of the reach that appears to be a delta bar from Baker Brook when the Rock was dammed downstream. It appears, from analysis of 1893, 1935 and 1954 U.S.G.S. topographic maps, that this reach was straightened between 1935 and 1954, most likely as part of the dam installation. (See Appendix A.)

The reach is currently an F plane bed stream type, departed from a C riffle pool by reference. The stream is currently in stage III of the F-stage channel evolution model, undergoing widening and planform adjustment. It is highly sensitive and in fair geomorphic condition. The habitat condition was good. The two gullies and one mass failure were likely triggered when the dam was removed and the water and sediment levels were lowered.

This relatively undeveloped reach is strategically located just down stream of predominantly straightened reaches and just upstream of an old dam site and the village of Williamsville, making it a good candidate for a floodplain restoration and corridor protection project.

T2.05A

Segment A is located just upstream of the covered bridge on the Dover Road and is in a broad valley. It is a C riffle pool stream type currently and by reference. It is in good geomorphic condition and is in stage I of the F-stage channel evolution model with minor widening as the dominant adjustment process. Stream sensitivity is moderate and the habitat condition was rated good. Reference channel width is 67' and current channel width is 73'.

The upstream end of this segment has some encroachment from the road and a few houses in the corridor, but otherwise, the corridor is undeveloped and forested. There are no constrictions in this segment. It has five side bars, one mid-channel bar and one transverse riffle. It appears, from analysis of 1893, 1935 and 1954 U.S.G.S. topographic maps, that this reach was almost entirely straightened between 1935 and 1954. (See Appendix A.) The upstream end of this reach is shown to be split by the road in the 1935 topographic map but the whole channel was moved to the north by the 1954 topographic map.

This segment is a candidate for river corridor conservation.

T2.05B

This reach was segmented due to channel dimension, substrate size, and planform and slope. It is located in a narrow valley due to human caused changes to the valley width (it is up against the road). This segment is eroding on the left bank for the entire length and has rip rap along one third of right bank where the road is closest to the channel. There was an active logging operation along the top of the left bank, a steep riffle in the down stream portion of the reach and a very large mid-channel bar dominating the mid section of the reach. There are no channel constrictions in this segment. Reference channel width is 67' and current channel width is 128'.

The stream is currently an F plane bed, though it is a C type stream by reference. It is in stage IV of the F-stage channel evolution model, currently experiencing planform adjustment. It is extremely sensitive and is in fair geomorphic condition. Habitat was rated in fair condition. The

entire length of this reach is shown to be split by the road in the 1935 topographic map but the whole channel was moved to the north by the 1954 topographic map. (See Appendix A.)

Because this segment has the first bend in 2,300'of river, it is the repository of a lot of sediment and energy dissipation. Since it will continue to be rip-rapped for the road, increasing sediment and flood attenuation areas upstream of it will alleviate pressure off of it

T2.05C

This is the upstream segment of T2.05 and ends just upstream of the confluence with the Marlboro Branch. The right bank is dominated by the road. There is one bridge that is a floodplain constriction with deposition below and scour above it. Reference channel width is 67' and current channel width is 73'.

The segment is a C riffle pool stream type currently and by reference. It is in good geomorphic condition and is in stage I of the F-stage channel evolution model with minor degradation and widening as the dominant adjustment processes. Stream sensitivity is moderate and the habitat condition was rated good.

The left bank of this segment is critical as floodplain that it accesses during high flow events and it should be conserved.

T2.06A

This reach was segmented due to channel dimension, substrate size and depositional features. It is located in a narrowly confined valley with no human caused changes to the valley width. It is extremely over-widened, with a reference channel width of 50' and current channel width is 84'.

There are no grade controls or constrictions on this reach. The left corridor is predominantly forested while the right corridor is dominated by residences. There are three steep riffles and one flood chute present in the reach.

It is currently an F plane bed stream type, departed from a reference C plane bed stream type. It is in channel evolution stage IV of the F-stage process. Its geomorphic condition is fair and its sensitivity is extreme. It is currently in planform adjustment and aggrading. The habitat was rated in fair condition.

There are berms on both banks near the confluence with the Marlboro Branch that could be removed if that would provide floodplain access.

T2.06B

This reach was segmented due to channel dimension and substrate size. It is located in a narrowly confined valley with human caused changes to the valley width. Reference channel width is 50' and the current channel width is 65'.

There are no grade controls or channel constrictions on this reach. The left corridor is predominantly forested while the right corridor is dominated by residences. Three flood chutes were noted in the segment. There is rip-rap in both the upstream and down stream portions of the reach.

The stream is currently a B plane bed stream type, departed from a reference C stream type due to moderate entrenchment. It is moderately sensitive and in good geomorphic condition. It is in stage IV of the F-stage channel evolution process and is undergoing minor aggradation. Habitat was assessed in fair condition.

Explore removing berms to provide floodplain access.

T2.07

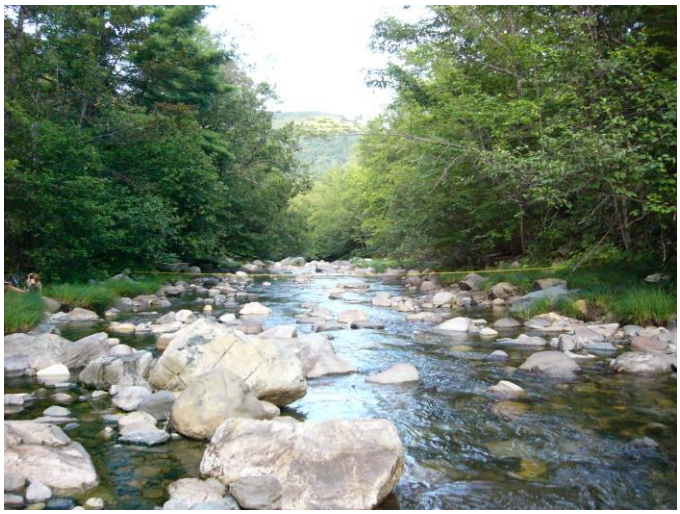
This reach runs along the Dover Road beginning at Stratton Hill Road and continuing .7 miles up stream. It is located in a broad valley and has one bridge that is not currently in use that is a channel constriction with deposition below and scour above and below. There are multiple mid, point and side bars in the channel, five flood chutes and one active stream crossing just upstream of the defunct bridge. Reference channel width is 49' and the current channel width is 58'.

C riffle-pool by reference, this stream is currently an F plane bed in fair geomorphic condition. Its stream sensitivity is very high and it is in stage IV of the F-stage channel evolution process. Habitat was assessed in fair condition as well.

Historically, this reach functioned as a sediment storage and flood attenuation asset, as do all C type streams, but it has degraded from a C to an F type stream. The multiple flood chutes indicate planform adjustment. Some time between 1935 and 1954 the road and river were moved south to their present location.

This reach is a critical attenuation asset for up and down stream reaches. If the structure were replaced (it accesses a camp that is in use) and the corridor conserved, it would narrow and re-build floodplain in the near term.

T2.08



A short reach located along the north side of the Dover Road just east of Brookside in a narrowly confined valley. There are multiple bed features, one flood chute and some springs and wetlands. There is ledge at the downstream end of the reach. Reference channel width is 48' and current channel width is 51'.

The town road used to cross the downstream end of this reach to continue along the left bank of the river. At some point between 1935 and 1954 the current road was put in on the south side of the river. The river appears to be closer to its original planform after this adjustment.

This reach is a reference B step-pool but it is currently a B plane bed due to active aggradation. It is in fair geomorphic condition and highly sensitive. Habitat was rated fair as well.

This reach is a candidate for corridor conservation of the of the right corridor.

T2.09

This reach is located immediately downstream of Brookside in a narrowly confined valley that is reduced in width because of the Dover Road. Twenty-seven percent of left bank is rip-rapped for the Dover Road. There are two mass failures on the right bank of the river, the upstream one being quite large. According to local resident and owner of

T2.11, Merrill Mundell, this failure (slide) started after the 1938 hurricane and it turns the river gray after big rain events. Immediately downstream of the large mass failure is a significant flood chute on the right bank. At the downstream end of this reach there is an old bridge abutment on the right bank and some historic berming also on the right bank associated with the old bridge and road location. Just upstream of this there is right bank berming that was left bank berming from an old channel. Reference channel width is 47' and current channel width is 64'.

This reach is B Plane Bed by reference as well as currently. It is aggrading with historic widening and is in fair geomorphic condition. It is in stage IV of the F-stage channel evolution model and the habitat condition is fair.

This reach is a candidate for corridor conservation of the right corridor.

T2.10

This reach starts in Brookside and ends just upstream of the Adam's Brook confluence. It is located in a narrowly confined valley and the Dover Road runs along the entire length of the left bank. The left and right banks are 25% rip-rapped and there are two mass failures on the right bank. One thousand feet of the reach are straightened and there are multiple point and side bars present in the channel. Reference channel width is 40' and current channel width is 52'.

The stream is a B step-pool by reference but is currently an F step-pool. It is in stage IV of the F- stage channel evolution model and is in fair geomorphic condition. It is undergoing planform adjustment with historic degradation. The habitat was found to be in good condition.

This reach is a candidate for corridor conservation.

T2.11

This reach runs from the confluence with Adam's Brook upstream to East Dover at the confluence with Taft Brook along the Dover Road. It is located in a narrowly confined valley and there are two gorges (one at either end of the reach) with numerous grade controls associated with the downstream gorge. The downstream gorge is a popular swimming area that is

made of a unique conglomerate rock that draws geology students from around the country (Merrill Mundell, Landowner interview).

At the downstream end of the reach there is one mass failure and one gully starting, both on the left bank. The mass failure extends all the way up to the road and has recently been treated with grading, erosion control fabric and seeding. The majority of this reach is well away from the road which makes it unique for the Rock River. There are numerous mid, point, side and diagonal bars throughout the reach and there is one human made channel constriction (a culvert) at the upstream end. The upstream gorge was the site of an old mill that is currently fenced off. There is a new box culvert that is 2' narrower than reference bankful at the upstream end of the reach, near the confluence with Taft Brook.

It appears, from historic topographic maps, that the town road used to be adjacent to the left bank. This feature was identified as an old logging road in the field. The reference channel width is 30'and the current channel width is 33'.

The stream is a B plane bed by reference and is currently a B. It is in stage I of the F-stage channel evolution process and its geomorphic condition is good. It is highly sensitive and the habitat condition is good.

This reach is a strong candidate for corridor conservation due to the undeveloped nature of the corridor and the fantastic scientific and recreational features of the downstream gorge area.

T2.12

This reach runs from East Dover upstream to Goose City and is located in a naturally narrowly confined valley that also has a road in it. There are numerous mid, point, side and diagonal bars as well as two islands and seven flood chutes throughout this reach. It is 17% bermed. The road is in the river corridor for almost half of its length. There are three bridges in this reach, one of which is a minor (< 1') channel constriction, and the other two are floodplain constrictions. There are three mass failures and two steep riffles. This is the first reach on the main stem with a large amount of woody debris (19 pieces). There are numerous seasonal camps in the corridor, one of which was being accessed by a new ford while we were surveying the stream. Reference channel width is 26' and current channel width is 31'.

At some time between 1899 and 1954 the road was moved from crossing this reach twice near the middle of it to staying entirely on the north side of it. (See Appendix A.) Evidence of

channel moving, significant amounts of berming and extreme incision indicate that much of this reach was probably straightened at some point.

This reach is a B plane bed by reference but is currently moderately entrenched and very incised, making it an F plane bed. It has undergone historic degradation and is presently in planform adjustment. The geomorphic condition is fair and it is in stage IV of the F-stage channel evolution process. The habitat condition is also fair.

This reach would benefit from the establishment of a Fluvial Erosion Hazard Zone (FEH) to prevent further encroachments into the corridor and from working with landowners and the town to implement best management practices as new camps and year round residences are built.

5.2 Baker Brook

T2.03-S2.01

This reach is located in a semi-confined valley that is altered due to the presence of a road. There are multiple mid, point, side and diagonal bars throughout the reach and there are two channel spanning grade controls in the middle of the reach. There are two bridges in this reach, neither of them are constrictions. This reach is in the process of re-building active floodplain and there are numerous old terraces along the right bank. There is a lot of placed rock in the channel, possibly dating from the 1973 flood. It would be helpful to research whether the road bed was raised along this reach.

The stream was typed a B plane-bed in the Phase 1 Assessment. It is currently an F plane bed due to historic bed degradation and is in stage IV of the F-stage channel evolution process. The reference channel width is 39'and the current channel width is 38'. It is in fair geomorphic condition and extremely sensitive due to the stream type departure. It is currently aggrading and in planform adjustment. The habitat was rated in good condition.

This reach is a candidate for corridor conservation and would benefit from the establishment of a Fluvial Erosion Hazard Zone (FEH).

T2.03-S2.02

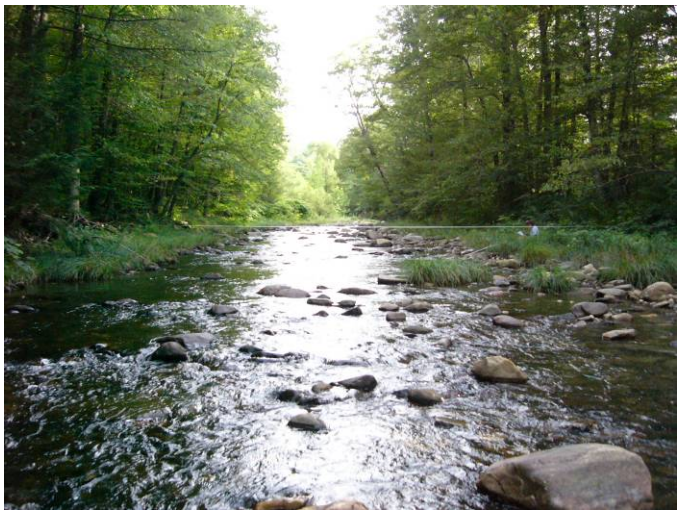
This reach is located in a narrowly confined valley that is even narrower due to the presence of a road along the entire length of the stream. There is one bridge in the reach that is a channel constriction as well as old abutments that are also channel constricting. Both structures have deposition above them. There are nine mid, one point, sixteen side and twelve diagonal bars in this segment as well as six flood chutes and eight storm water inputs. It would be helpful to research whether the road bed was raised along this reach. The reference channel width is 37'and the current channel width is 43'.

This reach is a C riffle pool by reference but is currently an F riffle pool due to historic degradation (entrenchment) and widening. It is in stage IV of the F-stage channel evolution model is extremely sensitive (due to the stream type departure) and in fair geomorphic condition. The habitat condition was good.

Restoration alternatives include: Exploring the removal of old abutments to see if floodplain access will be improved; working with towns and landowners on implementing BMP's for storm water management; conserving the corridor as this reach is an important sediment attenuation asset.

5.3 Marlboro Branch

T2.05-S1.01



The first reach of the Marlboro Branch begins in the village of South Newfane and continues south four tenths of a mile until the stream bends sharply west. It is located in a narrowly confined valley with Augerhole Road encroaching along two thirds of the right corridor. There is one bridge at the downstream end of the reach on the Dover Road that is a floodplain constriction. There is one flood chute, one transverse riffle and multiple point and side bars in the reach. There was an old channel in the left corridor. Reference channel width is 46' and current channel width is 65'.

The left bank vegetation was dominated by knotweed and the right bank was either ledge or rip-rap associated with the road. The reference channel width is 46' and the current width is 65'. The left corridor had abundant poison ivy and invasive burning bush (*Euonymus alatus)*. Burning bush "is a threat to woodland areas, fields, and coastal scrubland because it out competes native species" (The Nature Conservancy web page).

A review of the historic topographic maps (see Appendix A) reveals that some time between 1935 and 1954 the river was moved toward the right valley wall in this reach. An old channel was noted near the left valley wall during the assessment.

The reach is C riffle pool by reference and is currently a C plane bed due to aggradation. It is in stage IV of the F-stage channel evolution process with the dominant adjustment process being aggradation due to the loss of step-pool bed features. The stream is in fair geomorphic condition and highly sensitive. Habitat was rated fair.

This reach is a good candidate for management of invasive species that were otherwise rarely noted in the watershed and for corridor conservation due to the existing floodplain access along the right bank and the potential for it along the left bank.

T2.05-S1.02

Located in the towns of Newfane and Marlboro, this reach is 1.6 miles long and is in a broad valley type. It is at the western base of the valley and there are numerous historic channels evident, many point bars and flood chutes and it has 3,288' of erosion and over 1,800' of old berms on one bank. There are multiple mass failures on the left bank and an active stream ford crosses the channel. The entire length of it has been straightened. The reference channel width is 46' and the current channel width is 70'.

A review of the historic topographic maps (see Appendix A) reveals that some time between 1935 and 1954 the river was moved toward the left valley wall in this reach. An old channel was noted near the left valley wall in some places during the assessment.

The stream is a C riffle pool type of stream by reference and is currently moderately entrenched and incised to an F stream type. It is in stage III of the F-stage channel evolution process with planform being the dominant adjustment process. Its geomorphic condition is fair and sensitivity is very high. The habitat condition was good. This stream is regaining sinuosity in response to wholesale relocation of the channel.

This reach is a good candidate for passive geomorphic restoration as the channel is naturally re-creating sinuosity, it still has access to floodplain, there is limited development in the corridor and there is potential for increasing floodplain access through the removal of berms.

T2.05-S1.03

This reach begins at Gulf Brook and continues just past the junction of Augerhole Road and Lahar Road. It is located in a semi-confined valley with the left corridor being dominated by the Augerhole Road. The reach has approximately 3,800 of both left and right bank erosion and has over 800' of berming on the left or right bank. The right corridor is forested while the left corridor is dominated by the road. There are two bridges in the reach, both of which are floodplain constrictions. There are numerous mid, point, and side bars in the reach as well as five diagonal bars and five steep riffles. The reference channel width is 42' and the current channel width is 53'.

As with the two previous reaches on the Marlboro Branch, there is evidence that the river was moved and straightened between 1935 and 1954. Please see Appendix A for more information.

The reach is a C riffle pool by reference but is currently entrenched and incised, making it an F riffle pool. It is in stage IV of the F-stage channel evolution model with aggradation and planform adjustment being the current dominant adjustment processes. It is in fair geomorphic condition and the habitat condition is good.

This reach used to provide sediment and flood storage, but it has been converted to a transport reach due to road and valley wall constrictions. Conservation of the up and down stream reaches will relieve pressure on it.

T2.05-S1.04

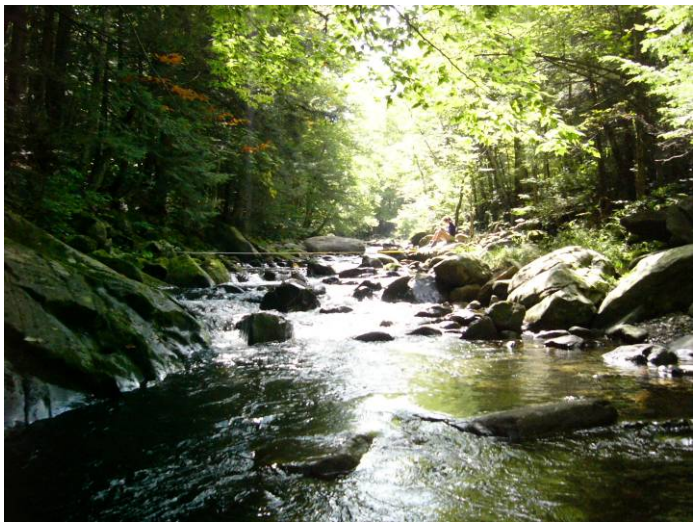
This reach is located along Augerhole Road from Lahar Road upstream to just after Adam's Brook joins the Marlboro Branch. It is a half a mile long and in a very broad valley type, though the valley narrows in the middle of the reach. There is 1,600' of berming and 780' of erosion along the reach. There is one bridge at the downstream end of the reach that is both a channel and floodplain constriction. The reference channel width is 38' and the current channel width is 56'.

The reach is C riffle pool both by reference and currently. It is in stage IV of the F-stage channel evolution process and is in good

geomorphic condition with minor planform being the dominant adjustment process. The habitat was also rated in good condition.

This reach is a good candidate for active restoration to remove berms that are restricting access to floodplain and for corridor conservation as it is a sediment and flood attenuation asset.

T2.05-S1.05



This reach begins just past the confluence with Adam's Brook, and runs 1.1 miles to just past the confluence with Worden Brook. It is located in a semi-confined valley and is dominated by ledge on the right bank and road encroachment along the left bank. There are abundant springs and seeps and some wetlands located along this reach. Eleven-hundred feet of erosion are along the left bank, numerous mid, point and side bars, four flood chutes and six steep riffles in the channel. The reference channel width is 36' and the current channel width is 36'.

The reach is a B step-pool currently and by reference. It is in stage IV of the F-stage channel evolution model and its geomorphic condition is good. It is moderately sensitive and has good habitat.

Removing berms where floodplain access would be improved is recommended for this reach.

5.4 Taft Brook

T2.11-S1.01A

This segment begins in East Dover and continues west until a series of channel spanning grade controls and two debris jams cause an elevation of the bed and accumulation of fine sediments upstream, reducing the particle size and changing the planform and slope of the channel to create a segment break. This reach is located in a narrowly confined valley that is narrower due to the presence of a road.

There are six structures in this reach, only one of which is not a channel constriction. They all have deposition above them and

all but one has deposition below and it has scour below. There are 12 mid channel, 22 point and 55 side bars in this reach alone and 22 pieces of large woody debris. This segment has 1,200' of erosion on both the right and left banks. There are three channel spanning natural grade controls in this segment as well. It is 21% rip-rapped along the left bank. The reference channel width is 15' and the current channel width is 18'.

This reach was originally typed as an A step pool in the Phase 1 assessment. After this assessment the reference stream type was changed to B riffle pool. This segment is currently an F riffle pool due to historic degradation and incision. It is in stage IV of the F-stage channel evolution process is undergoing planform adjustment and the geomorphic condition is fair. It is extremely sensitive and the habitat condition is also fair.

Working with landowners to replace undersized structures and implementing BMP's for storm water management is recommended for this reach.

T2.11-S1.01B

This reach was segmented from the other two due to smaller substrate size, a broad valley confinement and a different stream type. There was noticeably less erosion in this segment than in A and C, although there is one very active eroding site at the upstream end of it in a horse pasture. There is only one structure in this segment and it is not channel constricting, although there is deposition above and below it. There is an active animal crossing at the same horse farm where the sandy banks are eroding. There was evidence of gravel removal at one site in this reach and there are three mass failures. The reference channel width is 15' and the current channel width is 25'.

This reach was originally typed as an A step pool in the Phase 1 assessment. After this assessment the reference stream type was changed to B riffle pool. This segment is currently a Cb plane bed due to current aggradation. It is in stage III of the F-stage channel evolution process and the dominant adjustment process is aggradation. It is very highly sensitive and the geomorphic condition is fair. The habitat is also in fair condition.

This segment is providing much needed sediment attenuation in an otherwise transport area. Corridor conservation, including replanting the banks at the horse farm is recommended.

T2.11-S1.01C

This segment is located in a narrowly confined valley that is narrower due to the presence of a road. The one bridge and two culverts in this reach are all channel constrictions. The two culverts both have deposition above and below them. The bridge did not have evidence of deposition. There are 17 mid channel, 10 point and 13 side bars in this reach alone and 22 pieces of large woody debris. This segment has multiple mass failures and two flood chutes. There is one channel spanning natural grade control in this segment as well. The reference channel width is 15' and the current channel width is 18'.

This reach was originally typed as an A step pool in the Phase 1 assessment. After this assessment the reference stream type was changed to B riffle pool. This segment is currently an F riffle pool due to historic degradation. It is in stage IV of the F-stage channel evolution process is undergoing planform adjustment and the geomorphic condition is fair. It is extremely sensitive and the habitat condition is also fair.

Working with landowners to replace undersized structures and implement BMP's for storm water management is recommended for this reach.

6.0 Preliminary Project Identification

6.1 Analyzing River Processes

The goal of geomorphologically based river restoration is to reduce conflicts between human built infrastructure and rivers by re-establishing natural water and sediment relations (equilibrium) to the greatest extent possible. The Phase 1 and 2 Stream Geomorphic Assessments determine natural equilibrium (reference) and current stream types (departure from reference) to inform this planning process. This section of the report summarizes the different stressors and constraints in the watershed and prioritizes reaches for restoration at the reach and watershed scale. Further work is necessary to prioritize projects from a social perspective.

6.1.1 Hydrologic Alterations

The volume and rate at which water and sediment flow through a stream system, combined with the resistance of the bed material, work together to form the channel over the long-term life of a river. Alterations to this natural "hydrologic regime" can push a stream into disequilibrium, leading to increased erosion hazards. Hydrologic stressors and physical constraints that impact the volume and rate of water and sediment moving through the stream system were analyzed to aid in our understanding of current channel adjustment processes. Among the things that can affect the hydrology of a watershed are dams, loss of wetlands, deforestation, development and related increases in storm water runoff, and ditching related to roads, farm fields and skid ruts (VT DEC Phase 2 Protocols).

The Rock River Watershed has experienced alterations to its hydrologic regime in the form of a run of the river dam that was in place on T2.03 in the village of Williamsville from sometime between 1935 and 1954 until the mid-1980's when it came out. All of the reaches downstream and immediately upstream of this dam were affected by its presence and now by its removal.

Deforestation has affected most of the state of Vermont, with almost complete clearing occurring by the end of the 19th century and re-forestation to 75% forest cover by the end of the 20th century. It is likely that the Rock River is still re-bounding from the loss and the gradual re-growth of forest cover, and some of the historic incision and subsequent widening found in the watershed may be related to the increased flows resulting from the loss of trees.

Development greater than 10% is considered to alter the hydrologic cycle in a watershed. All of the assessed reaches have between five and ten percent developed lands. Seven of the sub-watersheds have between 10 and 15% developed land and three, including Taft Brook, have between 15 and 25% developed lands. Within the river corridor, there are 1.1 miles of development on both sides of the assessed reaches and 3.4 miles on one side for a total of 4.4 miles of development or 21% of the assessed corridors.

Road and road density also affect the timing and amount of water runoff in a watershed. Of the 21 river miles assessed, 12.1 miles have a road on one side within the corridor and 3.3 miles have a road on both sides within the corridor. Storm water inputs are related to development and road construction. There were only 19 storm water inputs identified throughout the watershed,

however, those inputs are concentrated on three reaches high up in the watershed: 8 on T2.03-S2.02 (Baker); 7 on T2.11S1.01 (Taft); and 4 on T2.05-S1.05 (Marlboro Branch).

6.1.2 Sediment Load Indicators

Erosion is a factor influencing the sediment regimes and adjustment processes on-going in the watershed. Changes to the natural flow of sediment can lead to channel aggradation or degradation. Stream bank erosion can be a major contributor to sediment load and is the result of either vertical or horizontal adjustments in the stream slope and planform. The Phase 2 Assessment quantifies on-going erosion impacts by measuring eroding banks and inventorying gullies, dams, steep riffles, mass failures and channel bars.

Current erosion is found on 2.3 miles (11%) of the right banks and 2.1 miles (10%) of the left banks, with the Marlboro Branch having the highest percentages overall. Mass failures can be related to erosion and are a significant source of sediment. There were 28 mass failures inventoried on 13 different segments. Nearly half of them (12) are on Taft Brook and three are on the second reach of the Marlboro Branch, which was straightened up against the valley wall. There are also three on T2.12.

Flood chutes and avulsions are an indication that the river is undergoing planform adjustment and also contribute to sediment load. There are 57 flood chutes and 2 avulsions in the assessed area: Seven each on T2.12, T2.03-S2.01 & 02 and five on T2.07. There are two flood chutes on each segment of T2.11-S1.01 (Taft) and three on T2.05-S1.05. There is one avulsion each on T2.05-S1.02 and T2.03-S2.02.

6.1.3 Channel Slope and Depth Modifiers

Erosion and mass failures can be triggered by incision that is the result of changes within the stream corridor and watershed including channel straightening, corridor encroachments, hard armoring, berming and channel constrictions. These impacts directly or indirectly affect channel slope and depth. Natural channel spanning grade control also affects channel depth by arresting degradation. Thirty percent of the assessed reaches were historically straightened (6.3 miles out of 21 miles assessed). Straightening a river concentrates flow, reduces bed resistance, and causes incision (downcutting) leading to widening.

Along with straightening and channelization, berms and hard armoring were common river management practices in the past. Of the assessed reaches, 2.3 miles (11%) of the banks are bermed and 2.1 miles of the left bank and .9 miles of the right bank are rip-rapped. One or both banks have 3.6 miles of development and 12.8 miles of either or both bank have an encroachment (mostly roads).

6.1.4 Boundary Condition and Riparian Modifiers

Riparian buffers provide many important functions for streams including: increased bank stability, reduction of overland surface water flow and shading the channel to reduce water temperatures. The following table summarizes the total number of different corridor buffer

widths in the watershed. This parameter is directly correlated to the large amount of roads within the stream corridor.

Right Buffer Width	Total Segments	Left Buffer Width	Total Segments
>100	12	>100	8
26-50	4	26-50	9
51-100	4	51-100	5
5-25	5	5-25	3
Grand Total	25	Grand Total	25

6.1.5 Constraints to Sediment Transport and Attenuation

Natural and human built constraints to sediment transport and attenuation (storage) exist throughout the watershed. These are separated into vertical constraints which keep the bed of the river from degrading and lateral constraints, which keep the river from moving sideways. Natural vertical constraints are channel spanning grade control and in this watershed, manmade constraints are culverts. Lateral constraints may be ledge or human built infrastructure such as roads and development.

There numerous bridges and culverts throughout the watershed. A Bridge and Culvert Assessment was completed on 29 structures that had abutments. There were a number of mostly pedestrian bridges to camps that were not assessed, but are included in the GIS theme of bridges and culverts. There are 11 bridges and culverts that are channel constrictions (8 of these on TAFT Brook). There are four reaches with channel constrictions: T2.07, T2.11, T2.11-S1.01 and T2.12. Channel constrictions can cause changes in the sediment regime – most notably increased deposition above them and a decrease in sediment supply below them. There are 25 bridges and culverts that are flood prone area constrictions (including the channel constrictions mentioned above). Reductions in the flood prone area increase flooding and sediment supply to downstream reaches during large flood events and can lead to channel degradation.

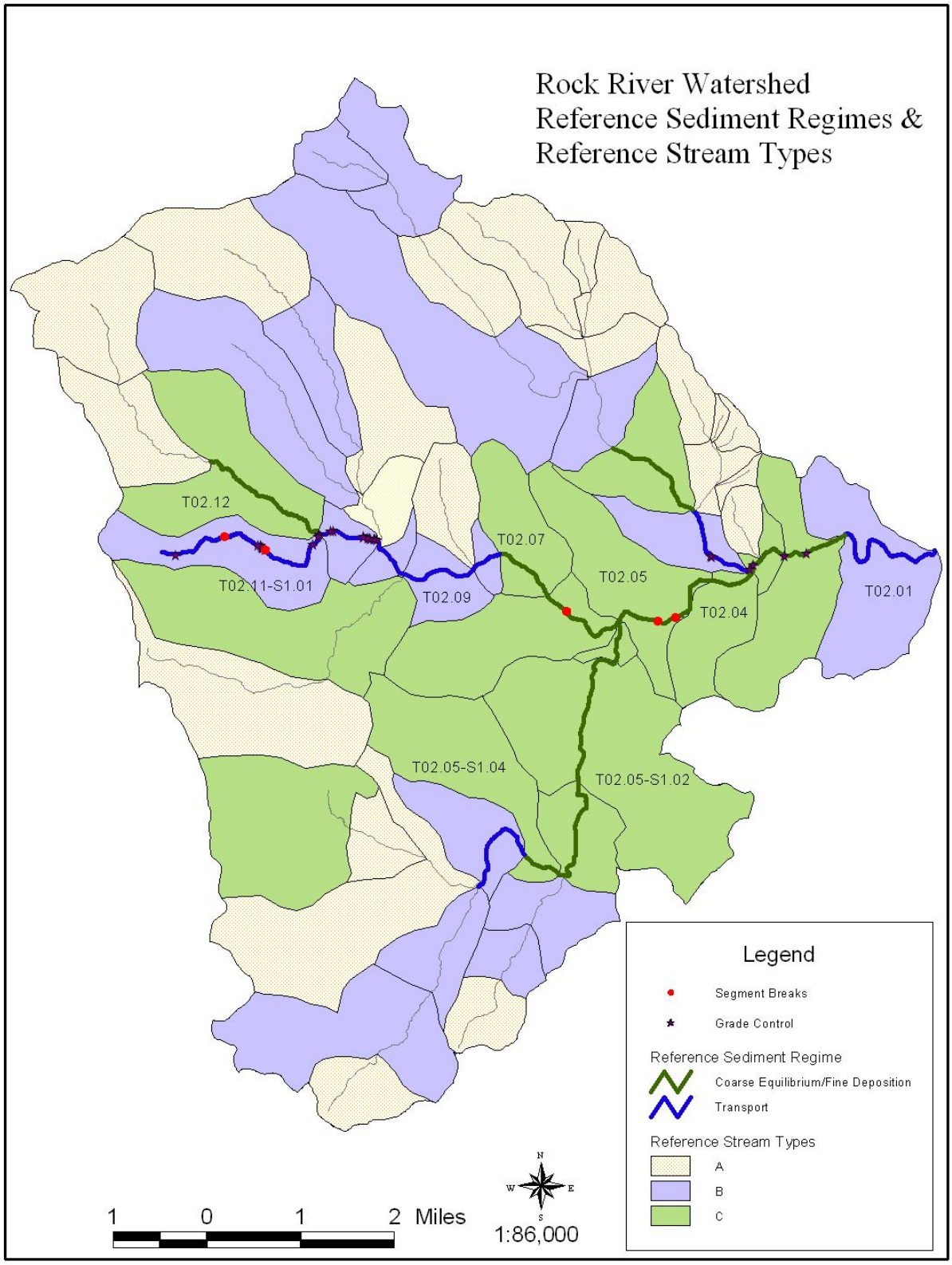
6.1.6 Existing and Reference Sediment Regimes

All of the modifiers, alterations and constraints analyzed above affect the current ability of the stream to store and move sediment. The Vermont DEC River Management Section has developed five different sediment regime descriptors to summarize reference and existing sediment transport capacity. These categories allow for a comparison of reference condition and existing sediment transport capacity and current channel adjustment, informing restoration project selection.

Streams that are in reference sediment regime fall into one of two categories: Transport and Coarse Equilibrium/Fine Deposition. Transport streams are those streams that are high gradient, naturally confined and have bedrock, boulder or cobble substrates. Coarse Equilibrium/Fine Deposition are streams that are in unconfined valleys and naturally provide areas for flood and sediment storage through flood plain access. Streams that are undergoing channel evolution will fall into one of the following three categories: Confined Source and Transport, Unconfined

Source and Transport and Fine Source and Transport. Confined Source and Transport are high gradient streams that have more erodable bed material and may be experiencing channel degradation and are located in naturally confined valley types. Unconfined Source and Transport are streams that have more erodable bed material, are located in unconfined valley settings and have experienced bank armoring and/or channel straightening. Finally, there are streams that are Fine Source and Transport/Coarse Deposition. These streams are located in unconfined valley settings with erodable bed material undergoing widening or planform adjustment. The latter two sediment regime types have been converted from natural Coarse Equilibrium/Fine Deposition type streams to transport type streams.

Streams that have been converted from Coarse Equilibrium/Fine Deposition to transport reduce sediment and flood attenuation capacity on that reach as well as watershed wide. This increases flood and erosion hazards downstream. Of the 25 segments assessed, 11 are transport (B type) streams by reference. There are 9 segments that have been converted to transport. Three of these converted streams have the potential to be restored to Coarse Equilibrium/Fine Deposition type streams. The following two maps represent reference and current sediment regimes in the Rock River Watershed.


Rock River Watershed
Reference Sediment Regimes &
Reference Stream Types
T02.12
T02.11-S1.01
T02.09
T02.07
T02.05
T02.04
T02.01
T02.05-S1.04
T02.05-S1.02
Legend
Segment Breaks
Grade Control
Reference Sediment Regime
Coarse Equilibrium/Fine Deposition
Transport
Reference Stream Types
A
B
C
1 0 1 2 Miles
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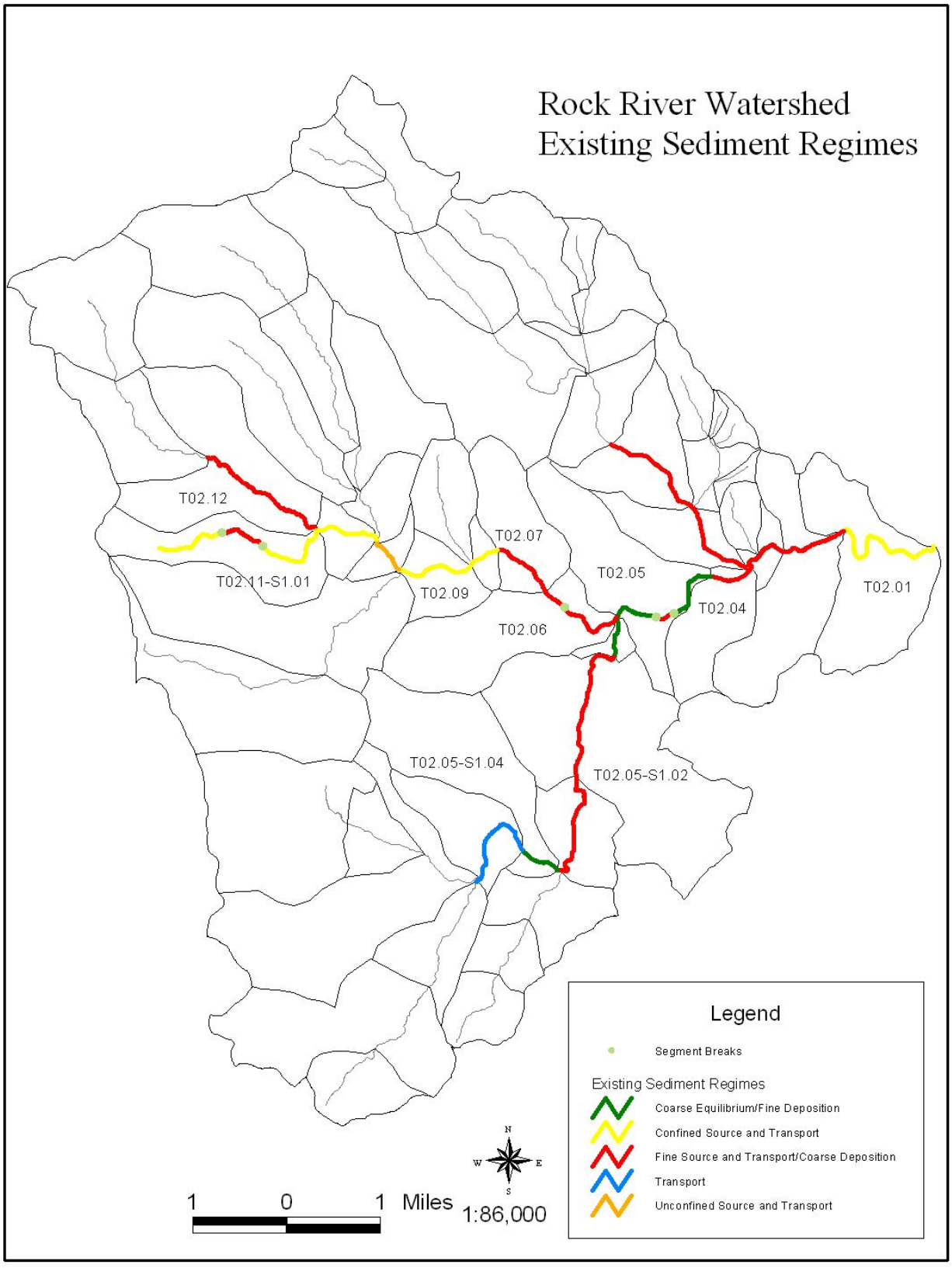
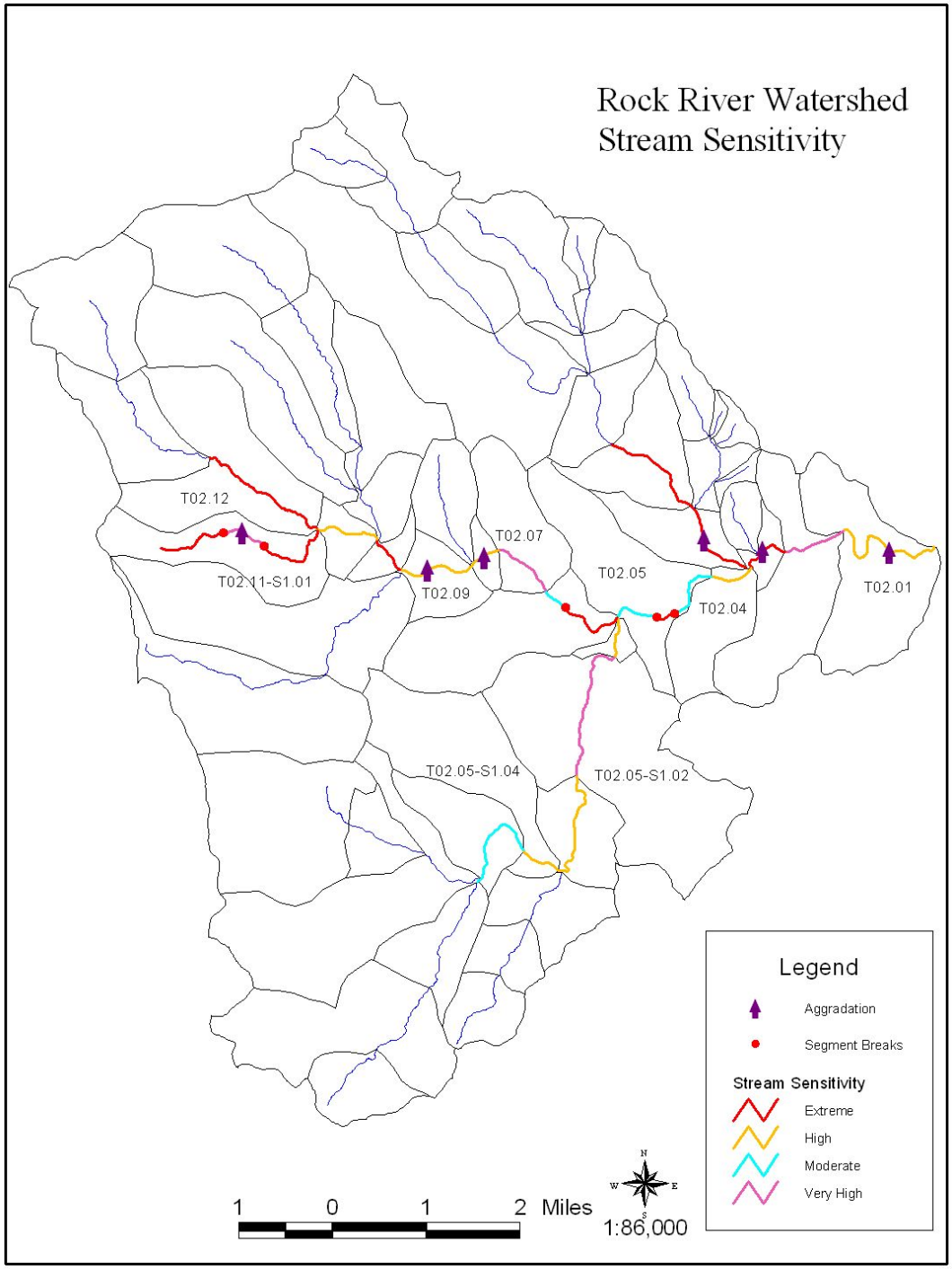

Rock River Watershed
Existing Sediment Regimes
T02.12
T02.11-S1.01
T02.09
T02.07
T02.06
T02.05
T02.04
T02.01
T02.05-S1.04
T02.05-S1.02
N
W
E
S
1 0 1 Miles
1:86,000
Legend
Segment Breaks
Existing Sediment Regimes
Coarse Equilibrium/Fine Deposition
Confined Source and Transport
Fine Source and Transport/Coarse Deposition
Transport
Unconfined Source and Transport

6.1.7 Sensitivity Analysis

The Vermont DEC River management Section has developed a five level sensitivity rating for streams based on current stream type and geomorphic condition. The rating scale is low, moderate, high, very high, and extreme. Sensitivity ratings are based on how rapidly a given stream type is expected to adjust (move laterally or horizontally) given its current geomorphic condition. The following map represents sensitivity ratings throughout the watershed.



Sensitivity ratings assist in restoration project selection by identifying areas where rapid channel planform adjustment may occur in the presence of valuable human-built infrastructure. The following table prioritizes reaches for restoration based on sensitivity, current adjustment and potential threats to infrastructure. The results were incorporated into project identification tables in the next section.

Sensitivity Analysis

River Segment	Sensitivity	Channel Evolution	Dominant Adjusment	Prioritization
T02.01-	High	IV	Aggradation	Low
T02.02-	Very High	IV	Aggradation	Medium
T02.03-	Extreme	IV	Planform/Aggradation	High
T02.04-	High	III	Planform/Widening	Low
T02.05A	Moderate	I	Minor Degradation/Widening	Low
T02.05B	Extreme	IV	Planform	High
T02.05C	Moderate	I	Minor Degradation/Widening	Medium
T02.05-S1.01-	High	IV	Aggradation	Medium
T02.05-S1.02-	Very High	III	Widening	High
T02.05-S1.03-	High	IV	Planform/Widening	High
T02.05-S1.04-	High	IV	Minor Planform	Low
T02.05-S1.05-	Moderate	IV	Planform	Low
T02.06A	Extreme	IV	Planform	High
T02.06B	Moderate	IV	Aggradation	Low
T02.07-	Very High	IV	Planform	Medium
T02.08-	High	IV	Aggradation	Medium
T02.09-	High	IV	Aggradation	Medium
T02.10-	Extreme	IV	Planform	High
T02.11-	High	IV	Aggradation	Low
T02.11-S1.01A	Extreme	IV	Planform	High
T02.11-S1.01B	Very High	IV	Aggradation	Medium
T02.11-S1.01C	Extreme	IV	Planform	High
T02.12-	Extreme	IV	Planform	High
T2.03-S2.01-	Extreme	IV	Aggradation	Medium
T2.03-S2.02-	Extreme	IV	Aggradation	Medium

6.2 Preliminary Project Identification and Prioritization

The Vermont DEC River Management Section has developed a step wise procedure for identifying and prioritizing restoration projects. The categories of projects are: 1. Protect River Corridors; 2. Plant Stream Buffers; 3. Stabilize Stream Banks; 4. Arrest Head Cuts; 5. Remove Berms; 6. Remove or Replace Structures; 7 Restore Incised Reach; and 8. Restore Aggraded Reach. The tables below provide a foundation for continued planning and restoration efforts. The first table identifies potential projects by reach and prioritizes them (highest priority in yellow). The second table examines the highest priority reaches in more detail, describing stressors and constraints and technical feasibility of the projects.

Project Identification and Prioritization

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps & Other Project Notes
T02.01-	Corridor Conservation	Low	High	Yes	Support Rock River Conservation Inc. -- This reach is very important to the community for recreation and is experiencing increasing development.
T02.02-	Restore floodplain access on left bank.	High	Medium	Yes	Talk with left bank landowners.
T02.03-	Outreach & Education	Medium	Medium	Yes	Passive river management is recommended for this reach that will naturally narrow and re-build its floodplain as it continues to adjust to the removal of the dam. Community outreach is recommended to help residents and swimmers understand the fluvial processes at work in their part of the river.
T02.04-	Corridor Conservation - possible restoration of channel to old bed.	High	High	Yes	Talk with landowners & explore re-locating the stream to the old channel -- This reach is an important sediment attenuation asset with no vertical or lateral constraints.
T02.05A	Corridor Conservation	High	High	Yes	Talk with landonwers - This reach is an important sediment attenuation asset with no vertical or lateral constraints.
T02.05B	None.				The river was historically on the other side of the road here - it will probably require on-going maintenance of rip-rap and continued management as a converted transport stream.
T02.05C	Corridor Conservation (Left bank only)	High	Medium	Yes	Talk with landowners.
T02.05-S1.01-	Corridor Conservation (Left bank only)	High	High	Yes	Talk with landowners.
	Manage invaisive species	High	High	Yes	Talk with landonwers.

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps & Other Project Notes
T02.05-S1.02-	Corridor Conservation & limited berm removal.	High	High	No	This reach has been 100% straightened. Further site assesment is required to determine if it can stay in this general location over the long term and/or to explore options for increasing sinuosity. It is an important sediment attenuation asset with no vertical or lateral constraints. Talk with landowners.
T02.05-S1.03-	None.				Conservation of up and down stream reaches as sediment attenuation assets will relieve pressure from this converted transport reach.
T02.05-S1.04-	Corridor Conservation	High	High	Yes	This reach is an important sediment attenuation asset with no vertical or lateral constraints and could help take pressure off of T2.05-S1.03.Talk with landowners.
	Replace Structure (bridge)	Medium	Low	Yes	Talk with Town.
	Berm Removal	Medium	Medium	Yes	Re-examine berms to see if they are impeding floodplain access.
T02.05-S1.05-	Berm Removal	Medium	Low	Yes	Re-examine berms to see if they are impeding floodplain access.
T02.06A	Berm Removal -	Low	Low	Yes	Berms on both sides of stream at confluence with Marlboro Branch. Other berms u/s not protecting infrasture. Re-examine berms to see if they are impeding floodplain access.
T02.06B	Berm Removal	Medium	Low	Yes	Re-examine berms to see if they are impeding floodplain access.
T02.07-	Corridor Conservation	Medium	High	Yes	This reach is an important sediment attenuation asset with no vertical and limited lateral constraints. Talk with landowners.

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps & Other Project Notes
T02.07-	Replace/Remove Structure (bridge)	High	High	Yes	Talk with landowners.
	Berm Removal	Medium	Medium	Yes	Talk with landowners.
T02.08-	Corridor Conservation (Right Bank)	Low	Low	Yes	Talk with landowners.
T02.09-	Corridor Conservation (Right Bank)	Medium	Low	Yes	Talk with landowners.
T02.10-	Corridor Conservation (Right Bank)	Medium	Low	Yes	Talk with landowners.
T02.11-	Corridor Conservation	Low	High	Yes	Talk with landonwer.
T02.11-	Replace Structure (new box culvert)	Low	Low	Yes	Talk with Town.
T02.11-S1.01A	Replace Structures (5!)	High	Medium	Yes	Talk with town and landowners.
T02.11-S1.01B	Replace Structure	Medium	Low	Yes	Work with town.
T02.11-S1.01B	Corridor conservation with buffer establishment at horse farm.	High	High	N/A	Work with landowners
T02.11-S1.01C	Replace Structures (2 w/abutments)	High	Medium	Yes	Work with town.
T02.11-S1.01C	Best Management Practices (stormwater inputs) for all of Taft	High	High	Yes	Work with towns and landowners.
T02.12-	Replace Structure (second one)	High	Medium	Yes	Work with town.
T2.03-S2.01-	Corridor Conservation (Right Bank)	Medium	Low	Yes	Talk with landowners.
T2.03-S2.02-	Berm Removal	Low	Low	Yes	Re-examine berms to see if they are impeding floodplain access.
	Best Management Practices (stormwater management)	High	High	Yes	Work with towns to establish BMP's for stormwater in the watershed.
	Corridor Conservation (Right Bank)	High	High	Yes	Talk with landowners.
	Remove old abutments	High	Medium	Yes	Determine if they are limiting floodplain access; talk with landonwers.

Rock River Corridor Planning Project and Strategy Summary Table				
Project #	Reach/Segment Condition/Sensitivity	Site Description including Stressors and Constraints	Project or Strategy Description	Technical Feasibility & Priority
1	T02.01- Confined Source & Transport High	Hydrologic stressors are moderate, sediment increase is moderate, no reach modification stressors, no vertial or lateral constraints, natural transport.	Corridor Conservation - support and expand efforts of Rock River Conservation Inc.	Project is on-going. High priority for social benefit.
2	T02.04- Fine Source & Transport High	Hydrologic stressors are moderate, sediment increase is high, no reach modification stressors, no vertical or lateral constraints, important sediment attenuation reach.	Corridor Conservation with possible restoration to old channel to move channel away from valley wall and provide floodplain access. Further assessment necessary.	High priority for sediement and flood water attenuation. Strategic location.
3	T02.05A Coarse Equilibrium/Fine Dep. Moderate	Hydrologic stressors are moderate, sediment increase is low, stream power increased through straightening, boundary resistance decreased b/c of buffer, no vertial or lateral constraints, important sediment attenuation reach.	Corridor Conservation.	High priority for sediment and flood water attenuation.
4	T02.05-S1.01- Coarse Equilibrium/Fine Dep. High	Hydrologic stressors are moderate, sediment increase is low, stream power is not increased, boundary resistance increased b/c of rb ledge, no vertical constraints, ledge is a lateral constraint.	Corridor conservation to protect floodplain access on left bank.	High priority for flood plain access.
5	T02.05-S1.02- Fine Source & Transport Very High	Hydrologic stressors are moderate, sediment increase is high, stream power increased through straightening, boundary resistance decreased b/c of rb buffer, no vertical or lateral constraints, important sediment attenuation reach.	Corridor Conservation, This reach has been 100% straightened. Further site assesment is required to determine if it can stay in this general location over the long term and/or to explore options for increasing sinuosity and removing berms.	Very High priority due to length, lack of constraints, current planform adjustment and historic straightening.
6	T02.05-S1.04- Coarse Equilibrium/Fine Dep. High	Hydrologic stressors are moderate, sediment increase is moderate, stream power increased through berming, no vertical or lateral constraints, important sediment attenuation asset.	Corridor Conservation. Improving this reach's ability to store sediment and flood water could reduce pressure on d/s reach.	High priority due to u/s relationship from T2.05-S1.03, a converted transport reach.

Project #	Reach/Segment Condition/Sensitivity	Site Description including Stressors and Constraints	Project or Strategy Description	Technical Feasibility & Priority
7	T02.07- Fine Source & Transport Very High	Hydrologic stressors are moderate, sediment increase is moderate, no reach modification stressors, no vertical constraints, only half of one bank has lateral (road) constraint, important sediment attenuation reach.	Corridor Conservation & possible structure removal and/or replacement.	High priority - rare mainstem reach with out lateral constraints.
8	T02.11- Confined Source & Transport High	Hydrologic stressors are moderate, sediment increase is low, no increase in stream power, boundary resistance is increased due to natural grade control, natural vertical and lateral constraints.	Corridor Conservation.	Social benefits high - this reach is natural transport with no encroachments in either corridor. High value for geology. Medium priority.
9	T02.11-S1.01A Confined Source & Transport Extreme	Hydrologic stressors are extreme, sediment increase is high,increase in stream power and boundary resistance, natural and human vertical constraints, road is a lateral constraint.	Replace undersized structures; work with community on BMP related to stormwater.	Very High priority due to extreme sensitivity of the segment.
10	T02.11-S1.01B Fine Source & Transport Very High	Hydrologic stressors are extreme, sediment increase is high, increase in stream power, no increase in boundary resistance, natural vertical constraints, road is a lateral constraint.	Restore aggraded reach; replace structure; reduce sediment inputs from u/s at farm.	High Priority to re-establish transport capacity of segment.
11	T02.11-S1.01C Confined Source & Transport Extreme	Hydrologic stressors are extreme, sediment increase is high, increase in stream power and no increase in boundary resistance, natural and human vertical constraints, road is a lateral constraint.	Replace undersized structures; work with community on BMP related to stormwater.	Very High priority due to extreme sensitivity of the segment.
12	T2.03-S2.02 Fine Source & Transport Extreme	Hydrologic stressors are high, sediment increase is high,increase in stream power and no increase in boundary resistance, no vertical constraints, road is a lateral constraint converted to transport.	Best management practices with Town, right bank corridor conservation.	Very High priority due to extreme sensitivity of the reach.

7.0 References

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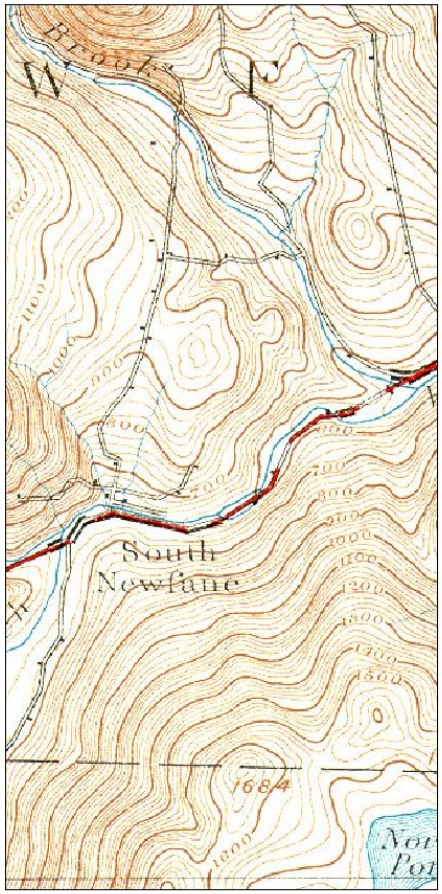
Rock River Phase 2 Stream Geomorphic Assessment

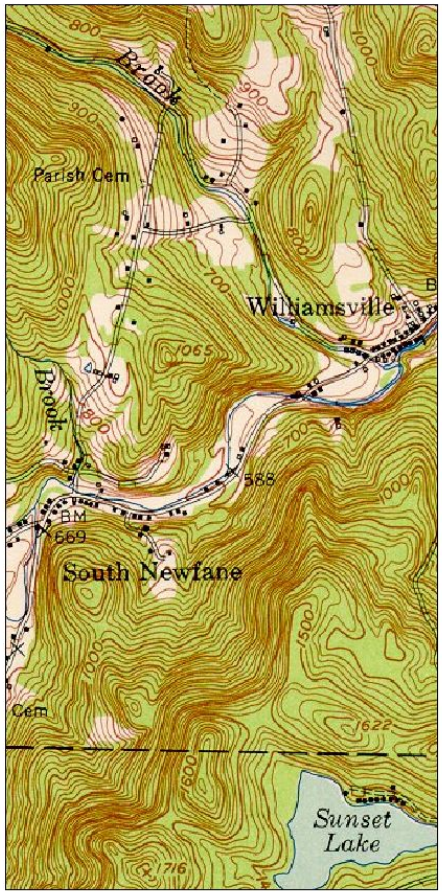
Appendix A

Historic Topographic Maps

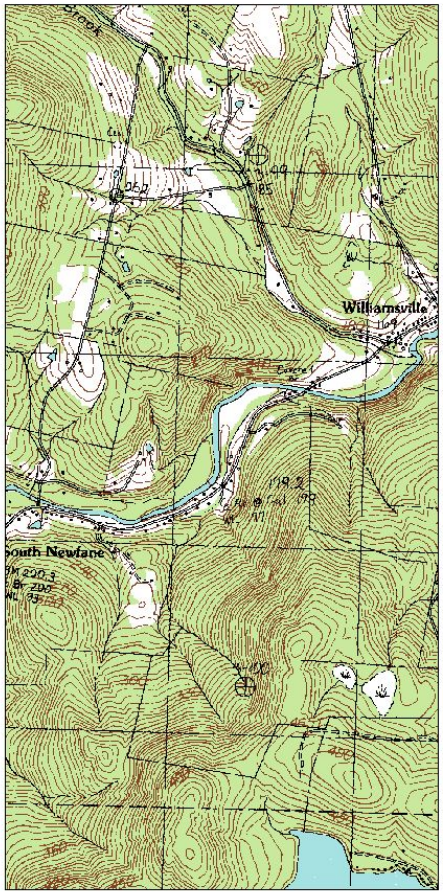
USGS Topographic Maps
Rock River T2.04 & T2.05



1935

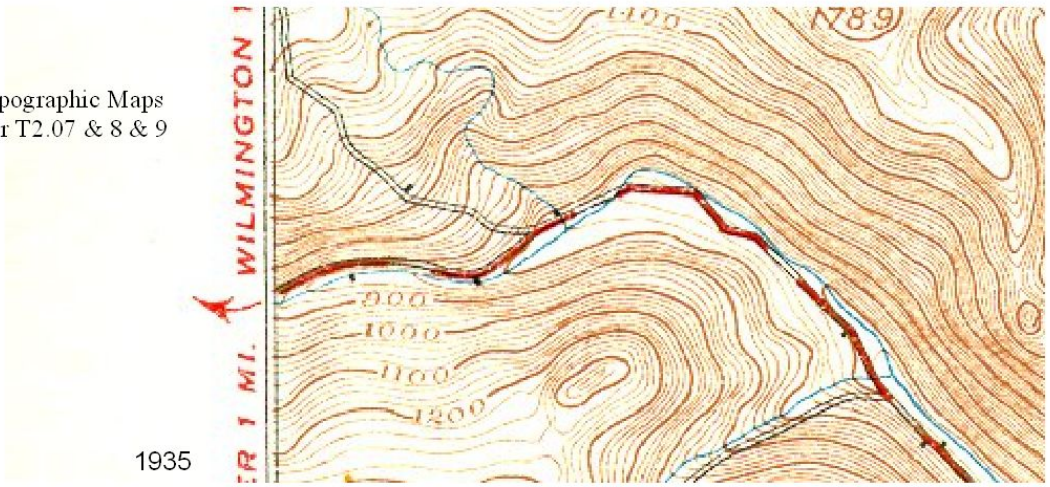


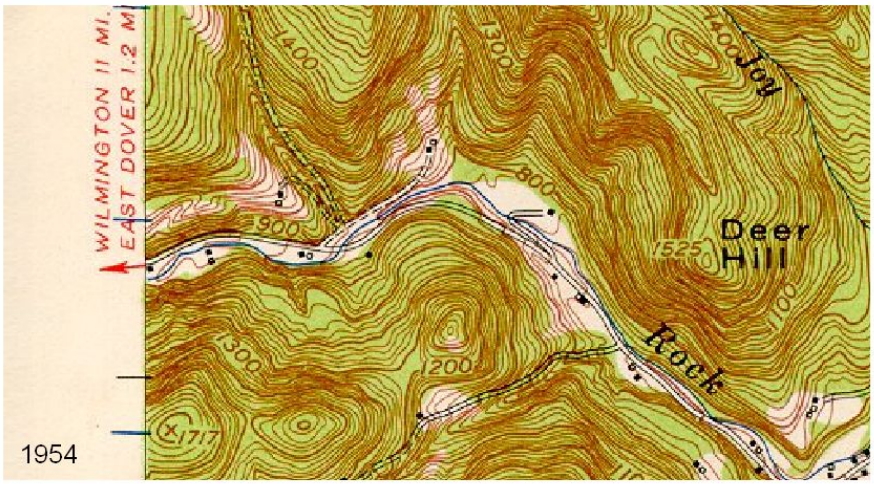
1954

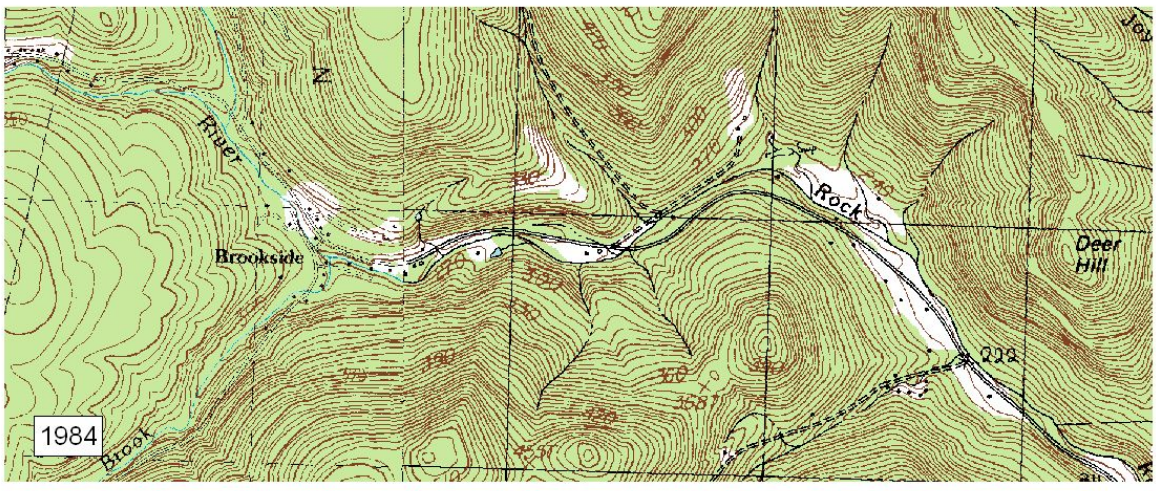


1984

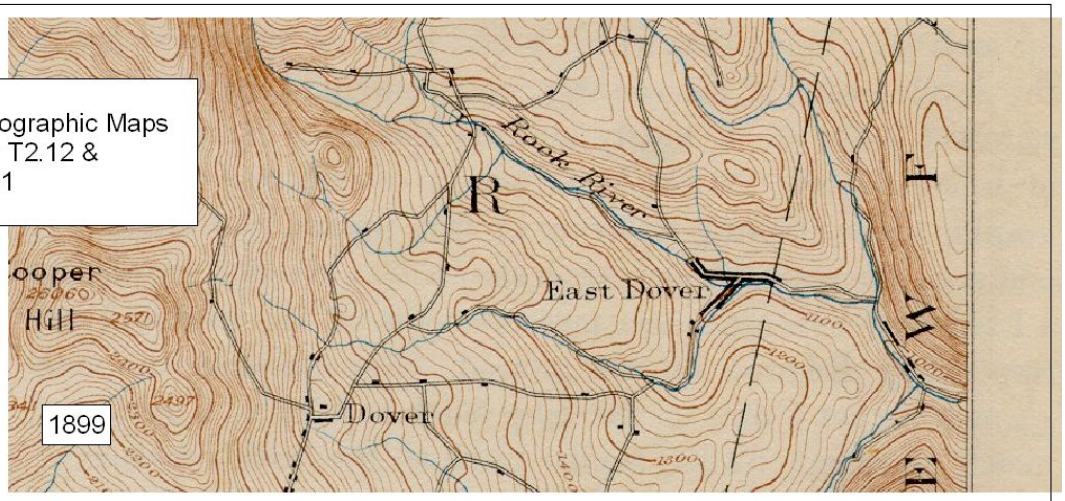
USGS Topographic Maps
Rock River T2.07 & 8 & 9

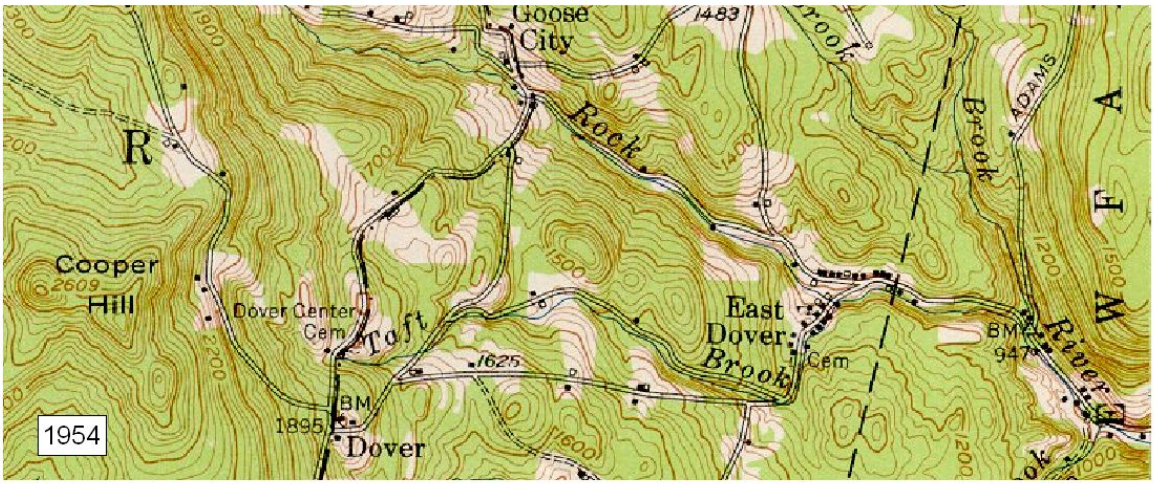


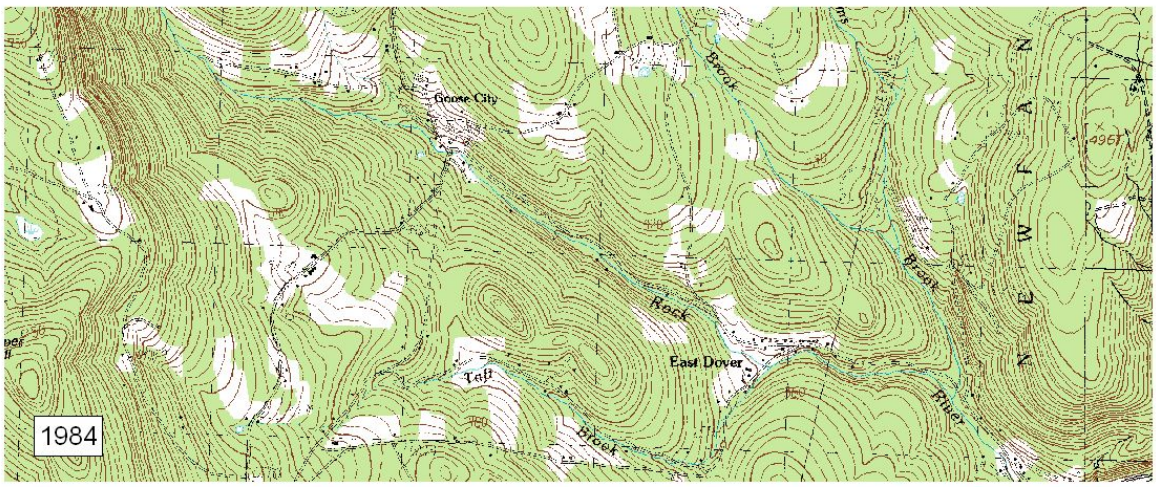




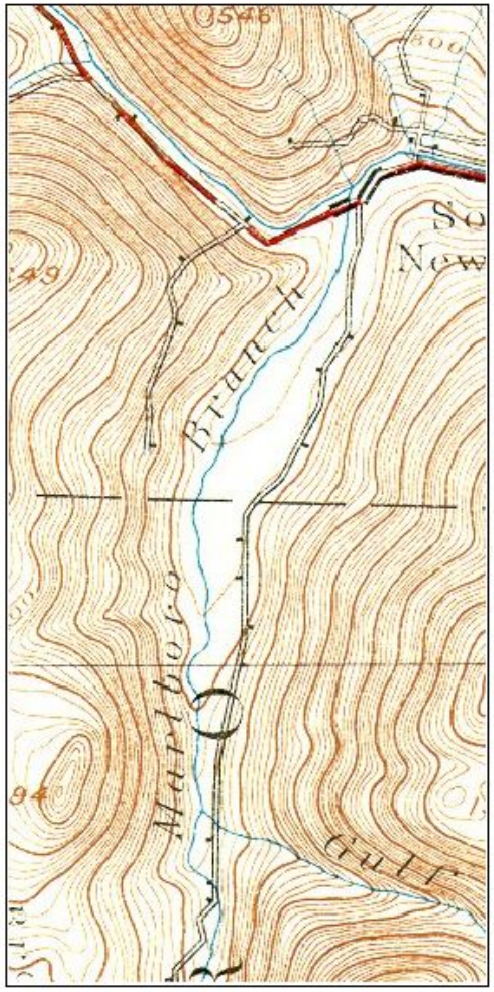
USGS Topographic Maps
Rock River T2.12 &
T2.11-S1.01







USGS Topographic Maps
Marlboro Branch T2.05-S1.01 & 1.02



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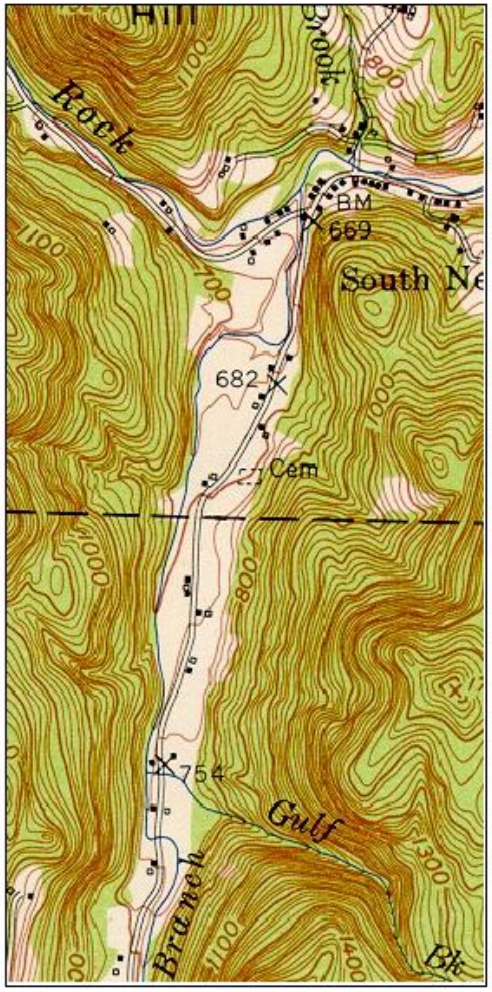

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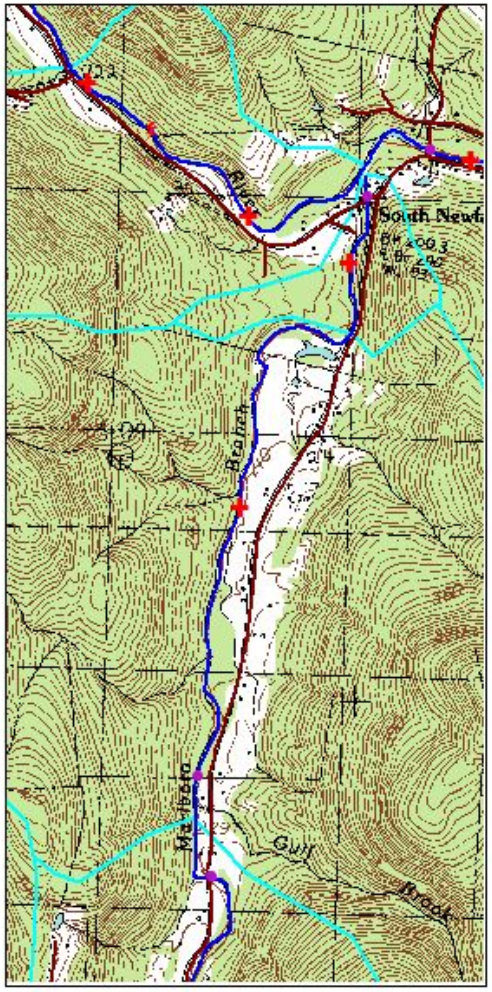
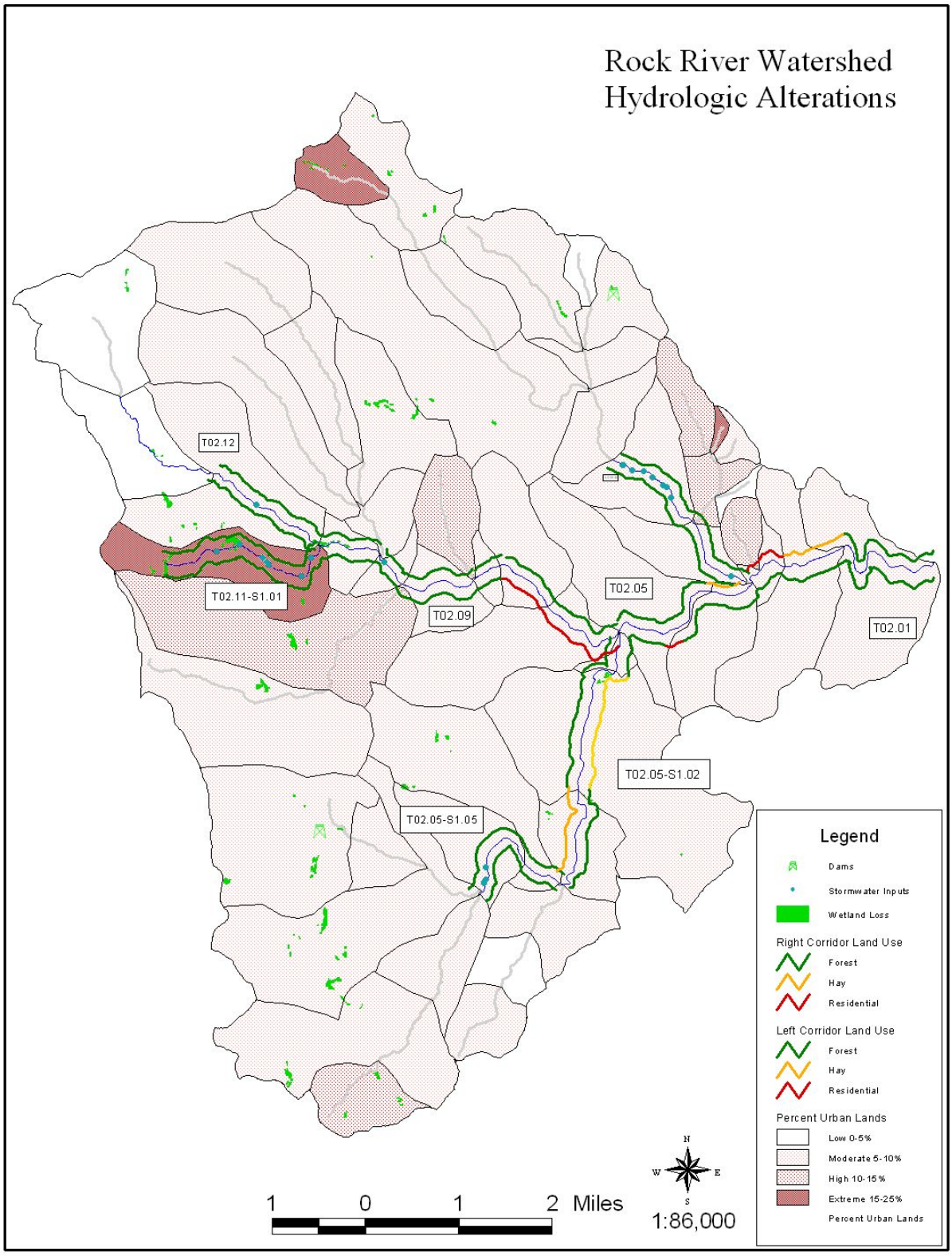


1984

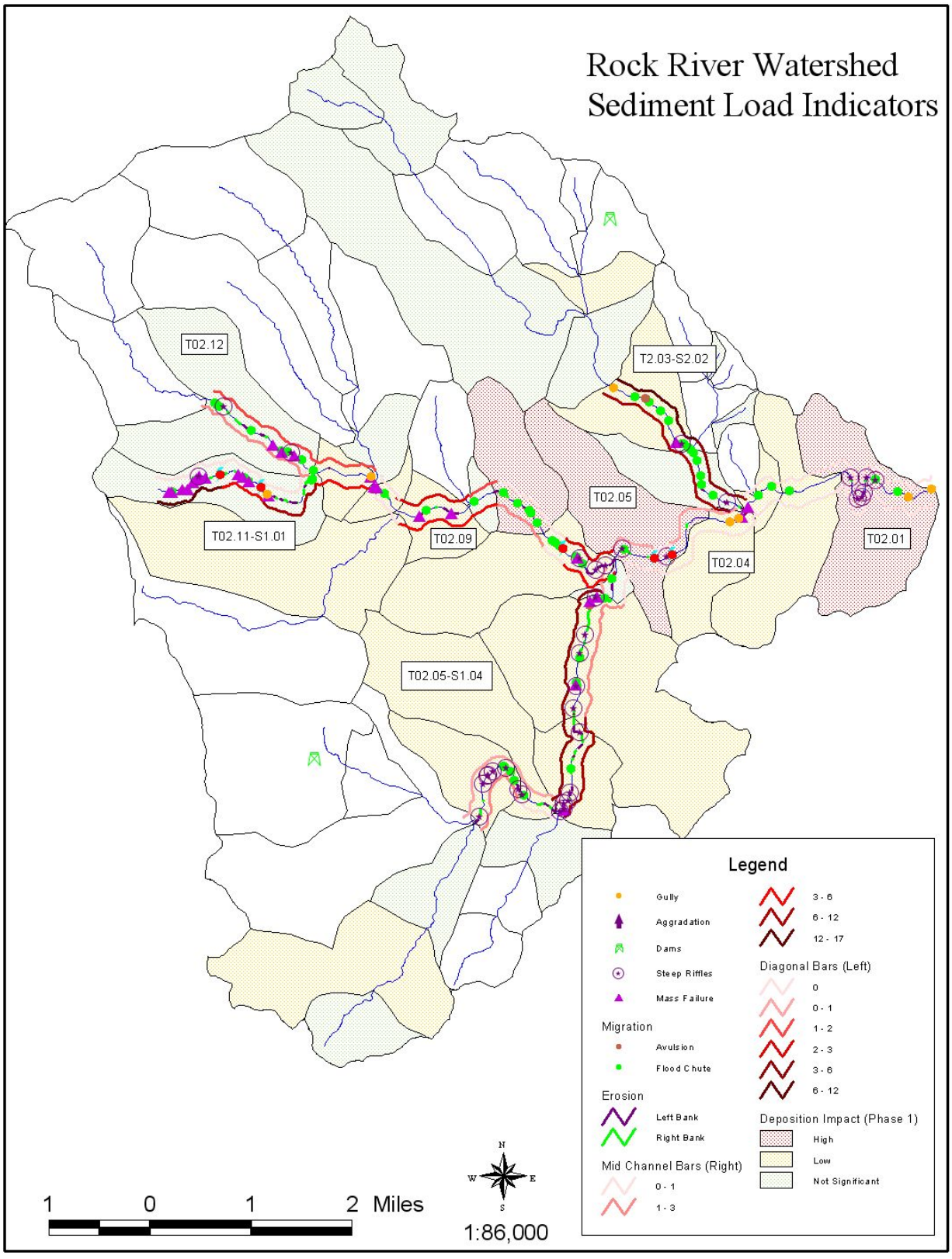
Hydrologic Alterations



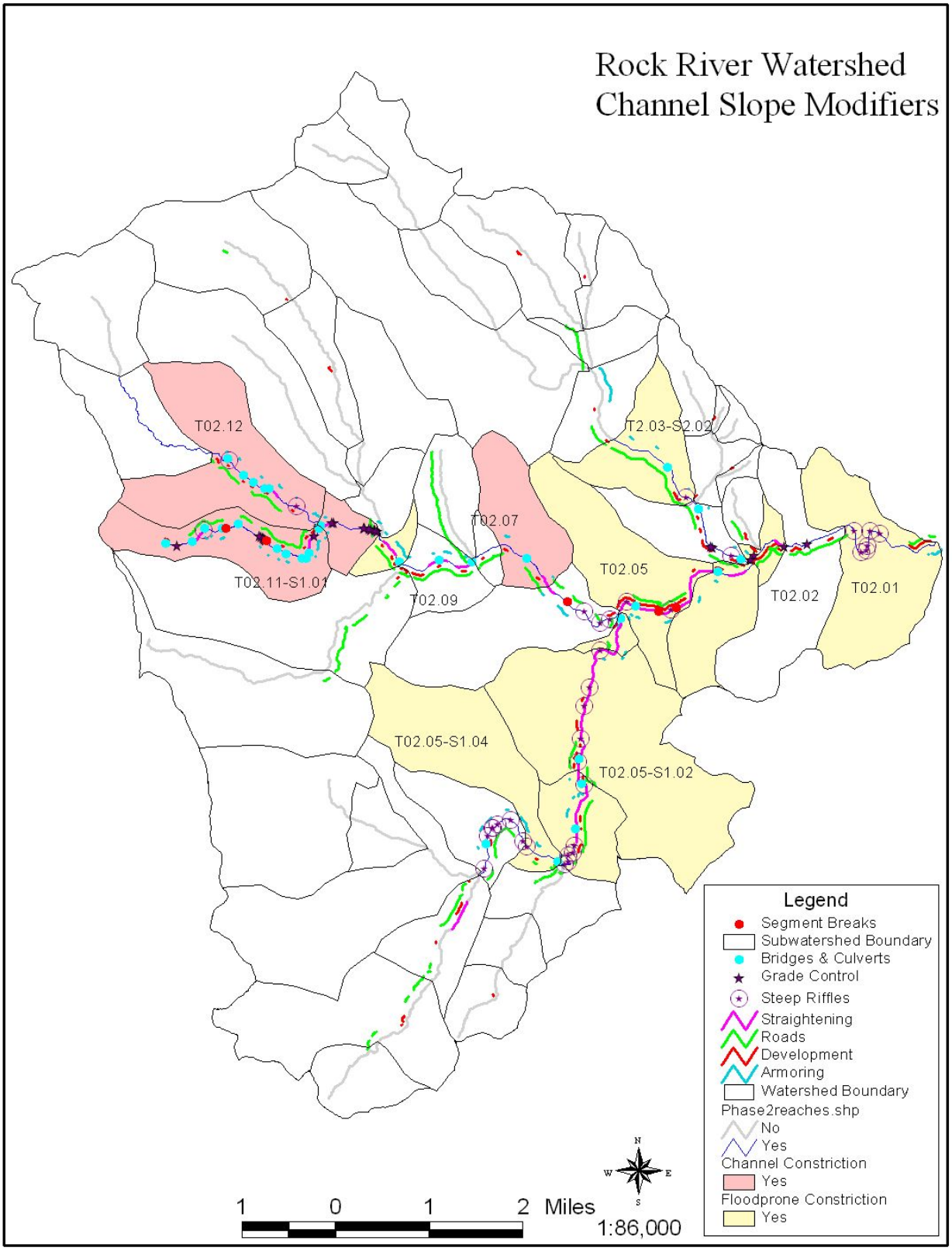
Hydrologic Stressors

	Watershed Input Stressors		Reach Modification Stressors	
River Segment	Hydrologic	Sediment Load Increase	Stream Power	Boundary Resistance
T02.01-	Moderate	Moderate	None	None
T02.02-	Moderate	Low	None	Increase - Bed (u/s GC)
T02.03-	Moderate	Low	Decrease - Constriction	Increase - Bed (GC)
T02.04-	Moderate	High	None	None
T02.05A	Moderate	Low	Increase - Slope (straightening)	Decrease - Buffer
T02.05B	Moderate	High	Increase - Slope (multiple))	Increase - Bank (armoring)
T02.05C	Moderate	Moderate	Increase - Slope (encroachments)	Decrease - Buffer
T02.05-S1.01-	Moderate	Low	Increase - Slope (multiple)	Increase - Bank (ledge)
T02.05-S1.02-	Moderate	High	Increase - Slope (straightening)	Decrease - Buffer
T02.05-S1.03-	Moderate	High	Increase - Slope (straightening)	None
T02.05-S1.04-	Moderate	Moderate	Increase - Depth (berming)	None
T02.05-S1.05-	Moderate	Moderate	Increase - Slope (encroachments)	Increase - (armoring); Decrease (buffer)
T02.06A	Moderate	High	Increase - Depth (berming)	None
T02.06B	Moderate	Low	Increase - Slope (straightening & encroachments)	Decrease - Bank (armoring)
T02.07-	Moderate	Moderate	None	None
T02.08-	Moderate	Moderate	Increase - Slope (encroachments)	Decrease - Buffer
T02.09-	Moderate	High	Increase - Slope (straightening & encroachments)	Increase - Bank (armoring)
T02.10-	Moderate	Low	Increase - Slope (straightening & encroachments)	Increase - Bank (armoring)
T02.11-	Moderate	Low	None	Increase - Bed (multiple GC)
T02.11-S1.01A	Extreme	High	Increase - Slope (straightening & encroachments)	Increase - Bank (armoring)
T02.11-S1.01B	Extreme	High	Decrease - Constriction (ledge & DJ)	Increase - Bed (GC)
T02.11-S1.01C	Extreme	High	Increase - Slope (straightening & encroachments)	None
T02.12-	Moderate	High	Increase - Slope & Depth (encroachments & berming)	None
T2.03-S2.01-	Moderate	High	Increase - Slope (encroachments)	None
T2.03-S2.02-	High	High	Increase - Slope (encroachments)	Decrease - Buffer

Sediment Load Indicators



Channel Slope Modifiers



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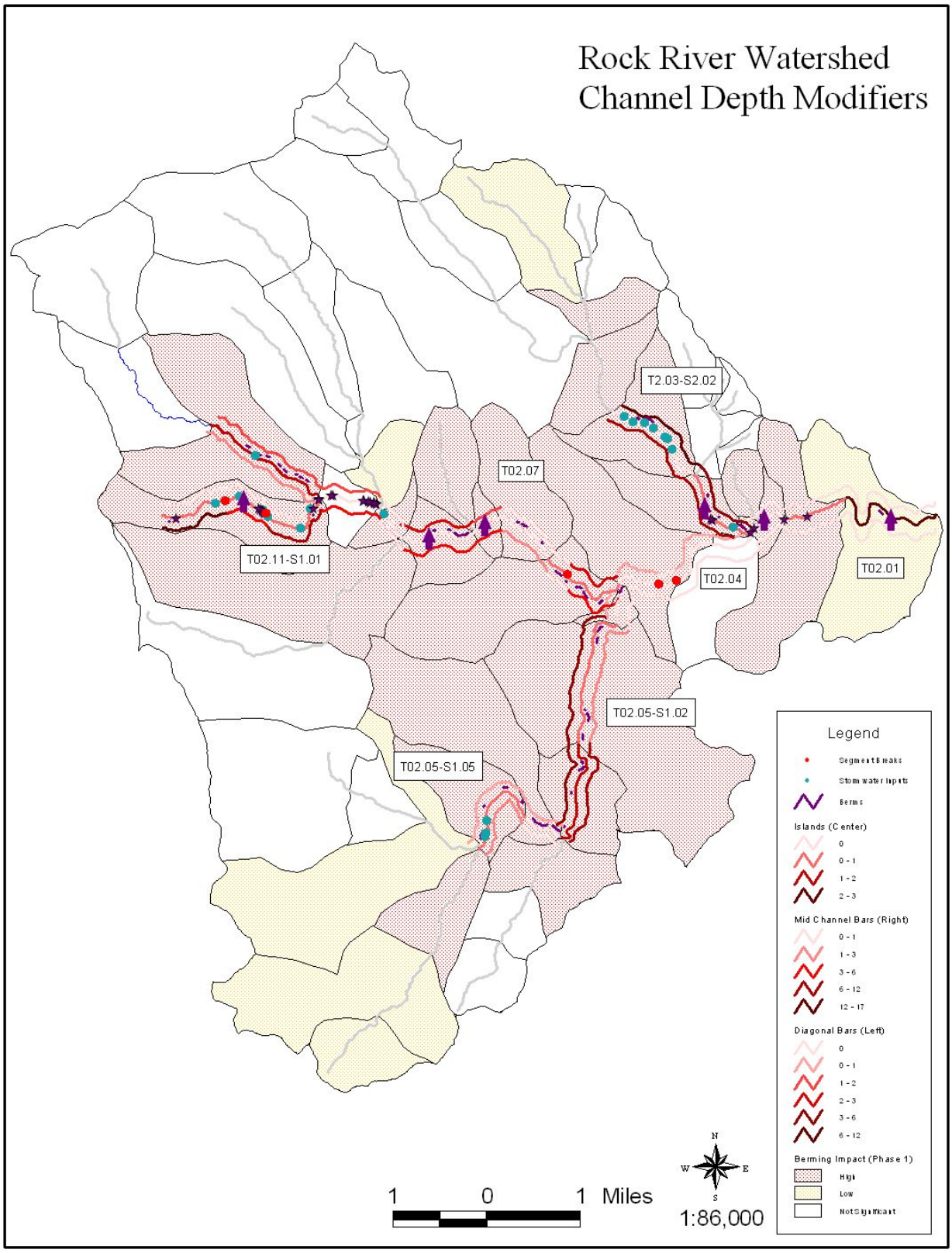
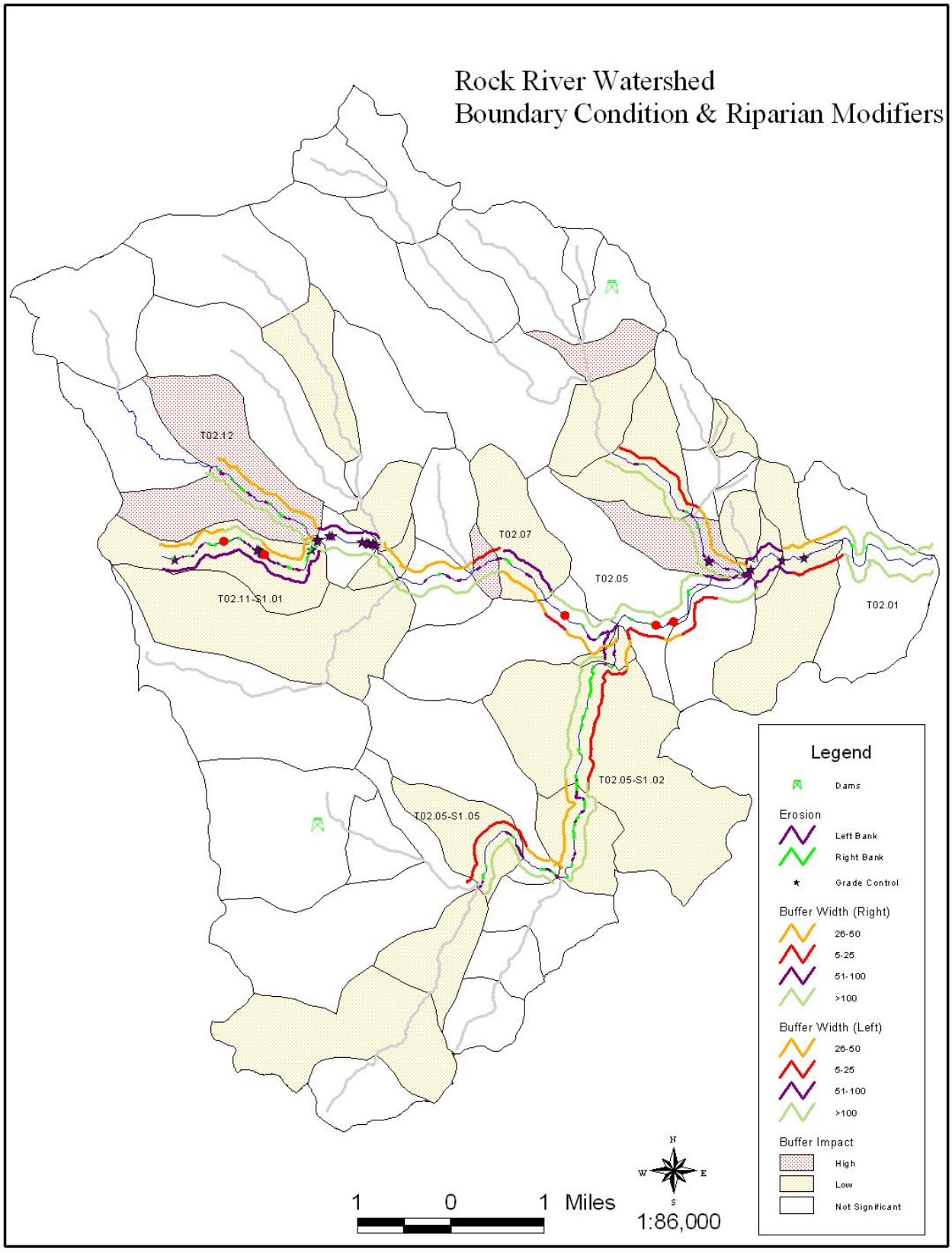


Boundary Condition and Riparian Modifiers



Constraints to Sediment Transport and Attenuation

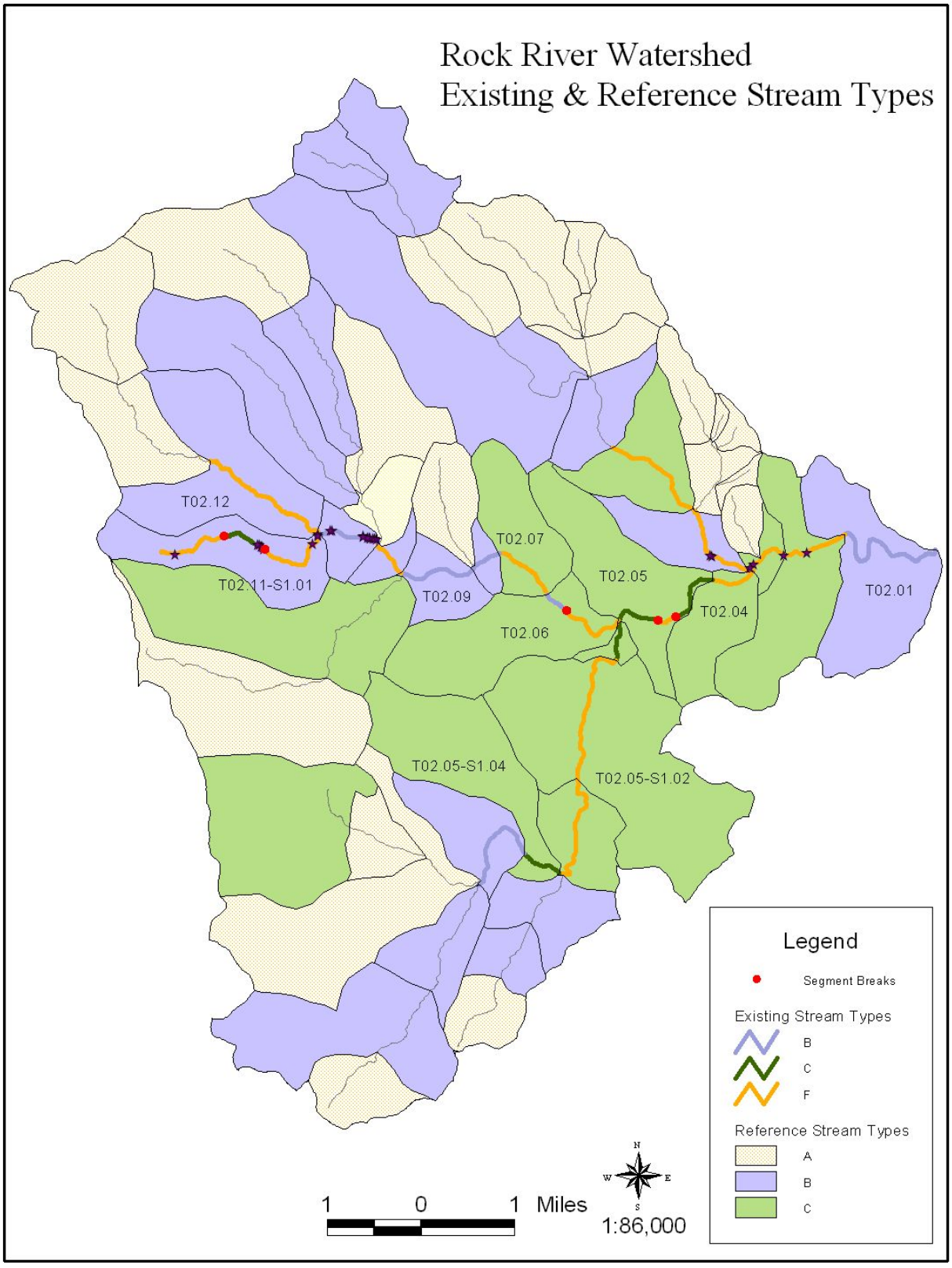
Departure Analysis

	Constraints		Transport		Attenuation		
River Segment	Vertical	Lateral	Natural	Converted	Natural	Increased	Asset
T02.01-	None	None	X			X	
T02.02-	Natural	Road		X	X		X
T02.03-	Natural	Road & Dev.		X	X	X	X
T02.04-	None	None		X	X		X
T02.05A	None	None			X		X
T02.05B	None	Road & Dev.		X	X		
T02.05C	None	Road & Dev.			X		X
T02.05-S1.01-	None	Road			X	X	X
T02.05-S1.02-	None	None			X		X
T02.05-S1.03-	None	Road		X	X		
T02.05-S1.04-	None	None		X	X		X
T02.05-S1.05-	None	Road	X				
T02.06A	None	Road & Dev.		X		X	
T02.06B	None	Road		X			
T02.07-	None	Road (half)		X	X		X
T02.08-	None	Road	X			X	
T02.09-	None	Road	X		X	X	
T02.10-	None	Road	X				
T02.11-	Natural	Natural	X			X	
T02.11-S1.01A	Natural & Human (cx4)	Road	X				
T02.11-S1.01B	Natural	Road (third)	X			X	
T02.11-S1.01C	Natural & Human (cx2)	Road	X				
T02.12-	None	Road (half)		X			
T2.03-S2.01-	Natural	Road & Dev.	X			X	
T2.03-S2.02-	None	Road		X	X		X

Yellow are priorty reaches as sediment attenuation assets.

(c) = culvert for vertical constraint

Existing and Reference Stream Types



Impact Summary Table

Reach	Bank Armoring or Revetment	Bridge or Culvert	Debris Jam	Development	Encroachment	% Eroding	Grade Control	Gully	Mass Failure	Migration	Steep Riffle or Head Cut	Stormwater Input	Straightening	Stream Crossing	% Straightened
T02.01	739	187		1378	1397	2%		2		2	6				0%
T02.02				919	3515	0%	1			1					0%
T02.03		254		2063	2604	1%	3		1	2			581		20%
T02.04	176	619		414		11%		2	1				1018		39%
T02.05	1040	363		3787	3771	9%				1	2		6873		94%
T02.05-S1.01	337	721		265	1091	7%				1			2268		100%
T02.05-S1.02	250			1435	3622	20%			3	5	5		7981	1	96%
T02.05-S1.03	1203	532		1055	5726	28%			3	1	6		4630		68%
T02.05-S1.04	276	114		215	2010	17%				1	1				0%
T02.05-S1.05	1978			272	5120	14%				4	7	4			0%
T02.06	1287			455	3813	12%			1	5	3		552	1	10%
T02.07	284	71		427	2208	13%				5			664	1	17%
T02.08				105	1734	9%				1			106		6%
T02.09	1291	364		1324	5464	8%			1	1			2221		49%
T02.10	1137	96		429	1701	4%			2	1		1	1026		46%
T02.11	346	108		144		2%	10	1	1	1			508		13%
T02.11-S1.01	1524	668	3	1077	7784	16%	10	1	12	6	1	7	2141	1	19%
T02.12	983	226		739	5196	15%			3	7	2	1	1132	1	14%
T2.03-S2.01	370	417		2108	4039	9%	2			7	1	1			0%
T2.03-S2.02	386	291	1	568	6865	3%		1	1	7	1	8		1	0%

Rock River Phase 2 Stream Geomorphic Assessment

Appendix B – Phase 2 Data

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Baker Brook** Reach # **T2.03-S2.02** Segment: **0** Completion Date: **August 31, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **6,190** Segment Location: **Baker Brook, along Baker Brook Rd near Parish Hill Rd**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**751**	**0**
Roads	**0**	**6,115**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**568**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Steep**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **53**

Width Determination **Measured**

Confinement Type **Narrowly**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This reach is a C riffle pool by reference but is currently an F riffle pool due to historic degradation (entrenchement) and widening. It is in stage IV of the F-stage channel evolution model is extremely sensitive (due to the stream type departure) and in fair geomorphic condition. Ford is new for acces to camp. It was 1 week old (according to a neighbor) when we saw it.

Step 2. Stream Channel

2.1 Bankfull Width	**43**
2.2 Max Depth (ft)	**2.50**
2.3 Mean Depth (ft)	**1.70**
2.4 Floodprone Width (ft)	**53**
2.5 Aband. Floodpln	**2.50**
2.6 Width/Depth Ratio	**25.29**
2.7 Entrenchment Ratio	**1.23**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**106**

2.12 Substrate Composition

Bedrock	**0**	%
Boulder	**11**	%
Cobble	**25**	%
Coarse Gravel	**23**	%
Fine Gravel	**17**	%
Sand	**24**	%

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **11**

2.13 Average Largest Particle on

Bed **14.0** **inches**

Bar **13.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**228**	**164**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**None**
Revetmt. Length (ft)	**386**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Coniferous**
Sub-dominant	**Coniferous**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**5-25**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**One**	**12.00**
Gullies	**One**	**15.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**1**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**8**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
9	**1**	**16**

Diagonal	Delta	Island
12	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
6	**0**	**1**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
1	**0**	**No**

5.4 Stream Ford or Animal **Yes**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Baker Brook** Reach # **T2.03-S2.01** Segment: **0** Completion Date: **August 24, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **5,151** Segment Location: **Mouth of Baker Brook, Williamsville Village**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**809**	**0**
Roads	**0**	**3,230**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**2,108**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Very Steep**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Cobble**	**Cobble**

1.5 Valley Features

Valley Width (ft) **107**

Width Determination **Measured**

Confinement Type **Semi-confined**

Rock Gorge? **No**

Human-caused changed valley width? **Yes**

Notes:

This reach is in the process of re-building active floodplain. There are numerous old terraces on the RB. Abundant placed rock in the stream, possibly post 1973 flood.

Step 2. Stream Channel

2.1 Bankfull Width	**38**
2.2 Max Depth (ft)	**1.30**
2.3 Mean Depth (ft)	**0.85**
2.4 Floodprone Width (ft)	**41**
2.5 Aband. Floodpln	**1.30**
2.6 Width/Depth Ratio	**45.18**
2.7 Entrenchment Ratio	**1.07**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Not Applicable**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**16** %
Cobble	**34** %
Coarse Gravel	**18** %
Fine Gravel	**17** %
Sand	**15** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **4**

2.13 Average Largest Particle on

Bed **19.6** **inches**

Bar **11.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**623**	**268**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Multiple**	**Rip-Rap**
Revetmt. Length (ft)	**324**	**47**

Near Bank Veg. Type	Left	Right
Dominant	**Coniferous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**Some**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**1**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
8	**3**	**11**

Diagonal	Delta	Island
6	**1**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
7	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
1	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Rock River Main Stem** Reach # **T02.12** Segment: **0** Completion Date: **August 22, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **7,821** Segment Location: **Rock River main stem, through Goose City**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**1,190**	**174**
Roads	**3,832**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**739**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Sometimes**	**Sometimes**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **150**

Width Determination **Measured**

Confinement Type **Narrow**

Rock Gorge? **No**

Human-caused changed valley width? **no**

Notes:

This reach is a B plane bed by reference but is currently an F. It is entrenched and incised, having undergone historic degradation. It is presently in planform adjustment. The river was historically closer to the LVW according to a30+ yr. resident, whose Father used to tell her about it. It may have been moved for the road or ag. The channel bermed in many places. Old channel bed obvious in many places.

Step 2. Stream Channel

2.1 Bankfull Width	**31**
2.2 Max Depth (ft)	**1.90**
2.3 Mean Depth (ft)	**1.31**
2.4 Floodprone Width (ft)	**42**
2.5 Aband. Floodpln	**7.90**
2.6 Width/Depth Ratio	**23.66**
2.7 Entrenchment Ratio	**1.35**
2.8 Incision Ratio	**4.16**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Not Applicable**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**15** %
Cobble	**44** %
Coarse Gravel	**17** %
Fine Gravel	**16** %
Sand	**8** %

Silt/Clay Present? **Yes**

Detritus **0** %

Large Woody **19**

2.13 Average Largest Particle on

Bed **15.0** **inches**

Bar **11.5** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**1,151**	**1,264**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**645**	**338**

Near Bank Veg. Type	Left	Right
Dominant	**Coniferous**	**Coniferous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**Multiple**	**55.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Some**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**1**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
2	**14**	**10**

Diagonal	Delta	Island
2	**0**	**2**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
7	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
2	**0**	**No**

5.4 Stream Ford or Animal **Yes**

5.5 Straightening **Yes**

Straightening Length: **1,132**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Taft Brook** Reach # **T02.11-S1.01** Segment: **C** Completion Date: **August 23, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **4,038** Segment Location: **U/S from horse farm to end of reach.**

Step 1. Valley and Floodplain

1.1 Segmentation **Substrate Size**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**61**	**0**
Roads	**2,356**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**239**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft): **59**

Width Determination: **Measured**

Confinement Type: **Narrow**

Rock Gorge?: **No**

Human-caused changed valley width?: **yes**

Notes:

This reach is highly affected by undersized bridges and culverts and narrowing and straightening from the road as well as numerous grade controls. The constrictions cause u/s aggradation. There are also numerous mf that seem to be caused by seeps high in the banks. The first bridge entered for this segment (11') has no abutments, thus no full bridge and culvert survey was done for it.

Step 2. Stream Channel

2.1 Bankfull Width: **18**

2.2 Max Depth (ft): **1.60**

2.3 Mean Depth (ft): **0.91**

2.4 Floodprone Width (ft): **21**

2.5 Aband. Floodpln: **4.10**

2.6 Width/Depth Ratio: **19.33**

2.7 Entrenchment Ratio: **1.19**

2.8 Incision Ratio: **2.56**

2.9 Sinuosity: **Low**

2.10 Riffles Type: **Complete**

2.11 Riffle/Step Spacing (ft): **22**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**12** %
Cobble	**30** %
Coarse Gravel	**15** %
Fine Gravel	**26** %
Sand	**17** %

Silt/Clay Present?: **No**

Detritus: **0** %

Large Woody: **22**

2.13 Average Largest Particle on

Bed **12.5** **inches**

Bar **11.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Undercut**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**389**	**397**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**347**	**32**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy: **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**51-100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**Multiple**	**9.50**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Abundant**

4.2 Adjacent Wetlands: **Some**

4.3 Flow Status: **Moderate**

4.4 # of Debris Jams: **1**

4.5 Impoundments: **None**

Impoundmt. Location

4.6 # of Stormwater Inputs: **1**

4.7 Upstream Flow: **None**

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
17	**10**	**13**

Diagonal	Delta	Island
0	**0**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
1	**0**	**No**

5.4 Stream Ford or Animal: **No**

5.5 Straightening: **Yes**

Straightening Length: **1,092**

5.5 Dredging: **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Taft Brook** Reach # **T02.11-S1.01** Segment: **B** Completion Date: **August 23, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **2,749** Segment Location: **Mid-segment grade control to u/s of farm opening on road.**

Step 1. Valley and Floodplain

1.1 Segmentation **Substrate Size**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**66**	**0**
Roads	**1,358**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**0**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **122**

Width Determination **Measured**

Confinement Type **Broad**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This segment is currently a C stream type. The slope is 2.9% which makes the subclass slope b still. There is significant aggradation exacerbated by a d/s debris jam and u/s erosion at the horse farm. There was evidence of gravel removal at one site in this segment near the horse farm.

Step 2. Stream Channel

2.1 Bankfull Width	**25**
2.2 Max Depth (ft)	**2.30**
2.3 Mean Depth (ft)	**2.00**
2.4 Floodprone Width (ft)	**120**
2.5 Aband. Floodpln	**2.30**
2.6 Width/Depth Ratio	**12.50**
2.7 Entrenchment Ratio	**4.80**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Sedimented**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**2** %
Cobble	**19** %
Coarse Gravel	**20** %
Fine Gravel	**33** %
Sand	**26** %

Silt/Clay Present? **Yes**

Detritus **0** %

Large Woody **10**

2.13 Average Largest Particle on

Bed **4.0** **inches**

Bar **7.0** **inches**

2.14 Stream Type

Stream Type: **C**

Bed Material: **Gravel**

Subclass Slope: **b**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Undercut**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Gravel**	**Gravel**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**193**	**223**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**None**
Revetmt. Length (ft)	**21**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Coniferous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**51-100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**Multiple**	**23.33**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Some**
4.2 Adjacent Wetlands	**Some**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**2**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**2**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
5	**15**	**11**

Diagonal	Delta	Island
0	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **Yes**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Taft Brook** Reach # **T02.11-S1.01** Segment: **A** Completion Date: **August 23, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **4,571** Segment Location: **First reach of Taft west of East Dover.**

Step 1. Valley and Floodplain

1.1 Segmentation **Substrate Size**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**57**	**0**
Roads	**3,886**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**838**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **59**

Width Determination **Measured**

Confinement Type **Narrow**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This reach is highly affected by undersized bridges and culverts and narrowing and straightening from the road as well as numerous grade controls. The constrictions cause u/s aggradation. There are also numerous mf that seem to be caused by seeps high in the banks.

Step 2. Stream Channel

2.1 Bankfull Width	**18**
2.2 Max Depth (ft)	**1.60**
2.3 Mean Depth (ft)	**0.91**
2.4 Floodprone Width (ft)	**21**
2.5 Aband. Floodpln	**4.10**
2.6 Width/Depth Ratio	**19.33**
2.7 Entrenchment Ratio	**1.19**
2.8 Incision Ratio	**2.56**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**22**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**12** %
Cobble	**30** %
Coarse Gravel	**15** %
Fine Gravel	**26** %
Sand	**17** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **22**

2.13 Average Largest Particle on

Bed **12.5** **inches**

Bar **11.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Undercut**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**1,239**	**1,256**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**980**	**145**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**51-100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**One**	**0.00**
Gullies	**One**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**Some**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**4**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
12	**22**	**55**

Diagonal	Delta	Island
0	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **1,048**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Rock River Main Stem** Reach # **T02.11** Segment: **0** Completion Date: **August 30, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **3,873** Segment Location: **Rock River main stem, between Brookside and East Dover**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	0	0
Roads	0	0
Railroads	0	0
Improved Paths	0	0
Development	144	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Flat
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Always	Always
Texture	Not Evalua	Sand

1.5 Valley Features

Valley Width (ft): **129**

Width Determination: **Measured**

Confinement Type: **Narrow**

Rock Gorge?: **Yes**

Human-caused changed valley width?: **no**

Notes:

This reach has a gorge on the d/s end and in the u/s section where a mill used to be. There is unique conglomerate rock in the d/s gorge. The majority of this reach is well away from the road which makes it unique for the Rock River. However, it appears, from historic topographic maps, that the town road used to be adjacent to the left bank. This feature was identified as an old logging road in the field.

Step 2. Stream Channel

2.1 Bankfull Width	33
2.2 Max Depth (ft)	2.30
2.3 Mean Depth (ft)	1.30
2.4 Floodprone Width (ft)	37
2.5 Aband. Floodpln	2.30
2.6 Width/Depth Ratio	25.38
2.7 Entrenchment Ratio	1.12
2.8 Incision Ratio	1.00
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	62

2.12 Substrate Composition

Bedrock	0 %
Boulder	18 %
Cobble	26 %
Coarse Gravel	19 %
Fine Gravel	14 %
Sand	23 %

Silt/Clay Present?: **No**

Detritus: **0** %

Large Woody: **7**

2.13 Average Largest Particle on

Bed **18.3** **inches**

Bar **14.3** **inches**

2.14 Stream Type

Stream Type: **B**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Step-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobbl	Boulder/Cobbl
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	190	0
Erosion Height (ft)	0.00	0.00
Revetmt. Type	Rip-Rap	None
Revetmt. Length (ft)	346	0

Near Bank Veg. Type	Left	Right
Dominant	Deciduous	Coniferous
Sub-dominant	None	None

Bank Canopy	Left	Right
Canopy %	76-100	76-100

Mid-Channel Canopy: **Closed**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	51-100	>100
Sub-dominant	None	None

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	None	None

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Forest
Sub-dominant	None	None

	Amount	Mean Height
Mass Failures	One	40.00
Gullies	One	40.00

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	Some
4.2 Adjacent Wetlands	None
4.3 Flow Status	Moderate
4.4 # of Debris Jams	0
4.5 Impoundments	None
Impoundmt. Location	
4.6 # of Stormwater Inputs	0
4.7 Upstream Flow	None
4.9 # of Beaver Dams	0
Affected Length (ft)	0

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
6	2	21

Diagonal	Delta	Island
2	0	0

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	0	0	0

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal: **No**

5.5 Straightening: **Yes**

Straightening Length: **508**

5.5 Dredging: **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Rock River Main Stem** Reach # **T02.10** Segment: **0** Completion Date: **August 30, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **2,245** Segment Location: **Rock River main stem through Brookside.**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**1,701**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**121**	**309**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **207**

Width Determination **Estimated**

Confinement Type **Narrowly**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This reach starts in Brookside and ends just upstream of the Adam's Brook confluence. It is located in a narrowly confined valley and the Dover Road runs along its entire length. The left and right banks are 25% rip-rapped and there are two mass failures on the right bank. One thousand feet of the reach are straightened and there are multiple point and side bars present in the channel.

Step 2. Stream Channel

2.1 Bankfull Width	**52**
2.2 Max Depth (ft)	**2.80**
2.3 Mean Depth (ft)	**1.83**
2.4 Floodprone Width (ft)	**62**
2.5 Aband. Floodpln	**2.80**
2.6 Width/Depth Ratio	**28.42**
2.7 Entrenchment Ratio	**1.19**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**150**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**19** %
Cobble	**19** %
Coarse Gravel	**21** %
Fine Gravel	**12** %
Sand	**29** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **1**

2.13 Average Largest Particle on

Bed **18.3** **inches**

Bar **14.6** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Step-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**0**	**180**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**575**	**562**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**51-75**	**76-100**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Residential**	**Residential**

	Amount	Mean Height
Mass Failures	**Multiple**	**10.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**1**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
0	**4**	**5**

Diagonal	Delta	Island
0	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **1,026**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Rock River Main Stem** Reach # **T02.09** Segment: **0** Completion Date: **August 18, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **No**

Segment Length (ft): **4,506** Segment Location: **Rock River main stem, below Brookside**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**1,096**	**0**
Roads	**3,632**	**736**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**1,262**	**62**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **125**

Width Determination **Measured**

Confinement Type **Semi-confined**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This reach is dominated by the Dover Road. It is difficult to see on the historic topographic maps, but it was likely moved in the past for road construction. The valley width has been narrowed by the road. There are two mass failures, one very large one, that dates to the 1937 flood.

Step 2. Stream Channel

2.1 Bankfull Width	**64**
2.2 Max Depth (ft)	**4.30**
2.3 Mean Depth (ft)	**2.65**
2.4 Floodprone Width (ft)	**83**
2.5 Aband. Floodpln	**4.30**
2.6 Width/Depth Ratio	**24.15**
2.7 Entrenchment Ratio	**1.30**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Eroded**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**33** %
Cobble	**25** %
Coarse Gravel	**9** %
Fine Gravel	**10** %
Sand	**23** %

Silt/Clay Present?	**No**
Detritus	**0** %
# Large Woody	**3**

2.13 Average Largest Particle on

Bed	**20.0**	**inches**
Bar	**15.1**	**inches**

2.14 Stream Type

Stream Type: **B**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**590**	**120**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**1,182**	**108**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**26-50**	**51-75**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**Multiple**	**115.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
5	**5**	**6**

Diagonal	Delta	Island
3	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **2,221**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | page 1 of 2 | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.08** | Segment: **0** | Completion Date: **August 17, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **No**

Segment Length (ft): **1,781** | Segment Location: **Rock River main stem, along Dover Rd, ending just u/s from trib T2.08-S1.01 that comes in**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**1,045**	**689**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**105**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Steep**	**Flat**
Continuous w/	**Never**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Cobble**	**Sand**

1.5 Valley Features

Valley Width (ft): **246**

Width Determination: **Estimated**

Confinement Type: **Narrowly**

Rock Gorge? **No**

Human-caused changed valley width? **Yes**

Notes:

The town road used to cross the downstream end of this reach to continue along the left bank of the river. At some point between 1935 and 1954 a new road was put in on the south side of the river and is the main road today. The river appears to be closer to its original planform after this adjustment.

Step 2. Stream Channel

2.1 Bankfull Width **51**

2.2 Max Depth (ft) **3.50**

2.3 Mean Depth (ft) **2.51**

2.4 Floodprone Width (ft) **67**

2.5 Aband. Floodpln **8.10**

2.6 Width/Depth Ratio **20.32**

2.7 Entrenchment Ratio **1.30**

2.8 Incision Ratio **2.31**

2.9 Sinuosity **Low**

2.10 Riffles Type **Eroded**

2.11 Riffle/Step Spacing (ft) **0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**25** %
Cobble	**29** %
Coarse Gravel	**21** %
Fine Gravel	**8** %
Sand	**17** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **1**

2.13 Average Largest Particle on

Bed	**21.0**	**inches**
Bar	**15.0**	**inches**

2.14 Stream Type

Stream Type: **B**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**304**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**None**
Revetmt. Length (ft)	**0**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Shrubs/Saplin**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**26-50**	**51-75**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**5-25**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps **Some**

4.2 Adjacent Wetlands **Some**

4.3 Flow Status **Moderate**

4.4 # of Debris Jams **0**

4.5 Impoundments **None**

Impoundmt. Location

4.6 # of Stormwater Inputs **0**

4.7 Upstream Flow **None**

4.9 # of Beaver Dams **0**

Affected Length (ft) **0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
4	**0**	**8**

Diagonal	Delta	Island
2	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **106**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.07** | Segment: **0** | Completion Date: **August 18, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **No**

Segment Length (ft): **3,802** | Segment Location: **Rock River main stem, along Dover Rd, beginning at Stratton Hill Rd. and continuing .7**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**604**	**0**
Roads	**1,604**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**427**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft)	**363**
Width Determination	**Measured**
Confinement Type	**Broad**
Rock Gorge?	**No**

Human-caused changed valley width? **yes**

Notes:

Historically, this reach functioned as a sediment storage and flood attenuation asset, as do all C type streams, but it has degraded from a C to an F type stream. The multiple flood chutes are indicative of planform adjustment. Some time between 1935 and 1954 the road and river were moved south to their present location. Floodplain access could be restored along portions of this reach, making it a good candidate for active geomorphic restoration.

Step 2. Stream Channel

2.1 Bankfull Width	**58**
2.2 Max Depth (ft)	**3.60**
2.3 Mean Depth (ft)	**2.40**
2.4 Floodprone Width (ft)	**79**
2.5 Aband. Floodpln	**5.40**
2.6 Width/Depth Ratio	**24.29**
2.7 Entrenchment Ratio	**1.35**
2.8 Incision Ratio	**1.50**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Eroded**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**18** %
Cobble	**25** %
Coarse Gravel	**20** %
Fine Gravel	**9** %
Sand	**28** %

Silt/Clay Present?	**No**
Detritus	**0** %
# Large Woody	**7**

2.13 Average Largest Particle on

Bed	**19.5**	**inches**
Bar	**9.3**	**inches**

2.14 Stream Type

Stream Type:	**F**
Bed Material:	**Gravel**
Subclass Slope:	**None**
Bed Form:	**Plane Bed**

2.15 Reference Stream Type
(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Undercut**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**545**	**416**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**Rip-Rap**
Revetmt. Length (ft)	**0**	**284**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**26-50**	**26-50**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**26-50**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Residential**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Some**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
3	**3**	**9**

Diagonal	Delta	Island
0	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
5	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal	**Yes**
5.5 Straightening	**Yes**
Straightening Length:	**664**
5.5 Dredging	**None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.06** | Segment: **B** | Completion Date: **August 17, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **No**

Segment Length (ft): **1,428** | Segment Location: **Southwest of Deer Hill, ends at Stratton Hill Road.**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**334**	**0**
Roads	**743**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**0**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **329**

Width Determination **Measured**

Confinement Type **Broad**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This reachis currently aggrading after historically incising and widening.

Step 2. Stream Channel

2.1 Bankfull Width	**65**
2.2 Max Depth (ft)	**3.60**
2.3 Mean Depth (ft)	**2.40**
2.4 Floodprone Width (ft)	**113**
2.5 Aband. Floodpln	**6.70**
2.6 Width/Depth Ratio	**27.08**
2.7 Entrenchment Ratio	**1.74**
2.8 Incision Ratio	**1.86**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Not Applicable**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**8** %
Cobble	**17** %
Coarse Gravel	**20** %
Fine Gravel	**18** %
Sand	**37** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **0**

2.13 Average Largest Particle on

Bed **12.0** **inches**

Bar **8.4** **inches**

2.14 Stream Type

Stream Type: **B**

Bed Material: **Gravel**

Subclass Slope: **c**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Mix**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**0**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**Multiple**
Revetmt. Length (ft)	**0**	**587**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Shrubs/Saplin**
Sub-dominant	**None**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**51-75**	**26-50**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**5-25**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Residential**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
0	**0**	**1**

Diagonal	Delta	Island
0	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
3	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **552**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.06** | Segment: **A** | Completion Date: **August 12, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **No**

Segment Length (ft): **3,931** | Segment Location: **West of South Newfane.**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**1,493**	**0**
Roads	**1,244**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**455**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **268**

Width Determination **Estimated**

Confinement Type **Narrow**

Rock Gorge? **No**

Human-caused changed valley width? **no**

Notes:

This reach was segmented due to channel dimension, substrate size and depositional features. It is located in a narrowly confined valley with no human caused changes to the valley width. This reach is currently in planform adjustment and is aggrading.

Step 2. Stream Channel

2.1 Bankfull Width	**84**
2.2 Max Depth (ft)	**4.20**
2.3 Mean Depth (ft)	**2.90**
2.4 Floodprone Width (ft)	**100**
2.5 Aband. Floodpln	**9.80**
2.6 Width/Depth Ratio	**29.10**
2.7 Entrenchment Ratio	**1.19**
2.8 Incision Ratio	**2.33**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Not Applicable**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**31** %
Cobble	**34** %
Coarse Gravel	**16** %
Fine Gravel	**11** %
Sand	**9** %

Silt/Clay Present?	**No**
Detritus	**0** %
# Large Woody	**5**

2.13 Average Largest Particle on

Bed	**14.0**	**inches**
Bar	**12.0**	**inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Gravel**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**1,047**	**212**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**Rip-Rap**
Revetmt. Length (ft)	**0**	**700**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**51-75**	**51-75**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Residential**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**One**	**125.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
6	**2**	**10**

Diagonal	Delta	Island
3	**0**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
3	**0**	**No**

5.4 Stream Ford or Animal **Yes**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Marlboro Branch** | Reach # **T02.05-S1.05** | Segment: **0** | Completion Date: **September 7, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **5,876** | Segment Location: **From just past the confluence with Adam's Brook 1.1 miles to just past the conluence with**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**975**	**0**
Roads	**4,145**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**272**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Very Steep**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Sometimes**
Texture	**Sand**	**Cobble**

1.5 Valley Features

Valley Width (ft): **85**

Width Determination: **Measured**

Confinement Type: **Semi-confined**

Rock Gorge?: **No**

Human-caused changed valley width?: **No**

Notes:

RB dominated by bedrock; LB contained by road.

Step 2. Stream Channel

2.1 Bankfull Width	**36**
2.2 Max Depth (ft)	**2.80**
2.3 Mean Depth (ft)	**1.40**
2.4 Floodprone Width (ft)	**50**
2.5 Aband. Floodpln	**2.80**
2.6 Width/Depth Ratio	**25.36**
2.7 Entrenchment Ratio	**1.42**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**32**

2.12 Substrate Composition

Bedrock	**26** %
Boulder	**18** %
Cobble	**12** %
Coarse Gravel	**10** %
Fine Gravel	**12** %
Sand	**22** %

Silt/Clay Present?: **No**

Detritus: **1** %

Large Woody: **1**

2.13 Average Largest Particle on

Bed **24.0** **inches**

Bar **16.0** **inches**

2.14 Stream Type

Stream Type: **B**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Step-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Bedrock**
Consistency	**Non-cohesive**	**Cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Bedrock**
Consistency	**Non-cohesive**	**Cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**1,153**	**440**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**1,796**	**182**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Coniferous**
Sub-dominant	**Coniferous**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy: **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**5-25**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**Residential**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**Some**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**4**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
3	**5**	**14**

Diagonal	Delta	Island
1	**0**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
4	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
7	**0**	**No**

5.4 Stream Ford or Animal: **No**

5.5 Straightening: **No**

Straightening Length: **0**

5.5 Dredging: **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | May 17, 2007 | **FIT: Yes**

Stream: **Marlboro Branch** | Reach # **T02.05-S1.04** | Segment: **0** | Completion Date: **September 7, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **2,372** | Segment Location: **Continues along Augerhole Road after Lahar Rd. heads south for .45 miles to just after**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**1,622**	**0**
Roads	**388**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**215**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **475**

Width Determination **Estimated**

Confinement Type **Very Broad**

Rock Gorge? **No**

Human-caused changed valley width? **no**

Notes:

The reach is C riffle pool both by reference and currently. It is in stage IV of the F-stage channel evolution process with minor planform being the dominant adjustment process.

Step 2. Stream Channel

2.1 Bankfull Width	**56**
2.2 Max Depth (ft)	**3.90**
2.3 Mean Depth (ft)	**2.33**
2.4 Floodprone Width (ft)	**180**
2.5 Aband. Floodpln	**6.50**
2.6 Width/Depth Ratio	**23.86**
2.7 Entrenchment Ratio	**3.24**
2.8 Incision Ratio	**1.67**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**52**

2.12 Substrate Composition

Bedrock	**0**	%
Boulder	**34**	%
Cobble	**15**	%
Coarse Gravel	**11**	%
Fine Gravel	**17**	%
Sand	**23**	%

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **0**

2.13 Average Largest Particle on

Bed **19.0** **inches**

Bar **13.0** **inches**

2.14 Stream Type

Stream Type: **C**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**307**	**480**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**None**
Revetmt. Length (ft)	**276**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**Some**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
1	**2**	**1**

Diagonal	Delta	Island
1	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
1	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Marlboro Branch** | Reach # **T02.05-S1.03** | Segment: **0** | Completion Date: **September 6, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **6,788** | Segment Location: **From the confluence with the Gulf Brook, the reach continues south 1.3 miles to the**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**818**	**0**
Roads	**4,908**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**1,055**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **147**

Width Determination **Measured**

Confinement Type **Semi-confined**

Rock Gorge? **No**

Human-caused changed valley width? **Yes**

Notes:

The reach is a C riffle pool by reference but is currently a F riffle pool due to moderate entrenchment. It is in stage IV of the F-stage channel evolution model with aggradation and planform adjustment being the dominant current adjustment processes. There is significant evidence from historic topographic maps that the river was moved and straightened between 1935 and 1954.

Step 2. Stream Channel

2.1 Bankfull Width	**53**
2.2 Max Depth (ft)	**2.40**
2.3 Mean Depth (ft)	**1.64**
2.4 Floodprone Width (ft)	**76**
2.5 Aband. Floodpln	**6.10**
2.6 Width/Depth Ratio	**32.07**
2.7 Entrenchment Ratio	**1.45**
2.8 Incision Ratio	**2.54**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**53**

2.12 Substrate Composition

Bedrock	**5** %
Boulder	**25** %
Cobble	**34** %
Coarse Gravel	**10** %
Fine Gravel	**13** %
Sand	**13** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **5**

2.13 Average Largest Particle on

Bed **19.0** **inches**

Bar **9.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**1,920**	**1,888**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**853**	**350**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Coniferous**
Sub-dominant	**Coniferous**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**One**	**12.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
10	**12**	**12**

Diagonal	Delta	Island
5	**0**	**2**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
6	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **4,630**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Marlboro Branch** | Reach # **T02.05-S1.02** | Segment: **0** | Completion Date: **September 1, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, CH** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **8,326** | Segment Location: **1.6 miles long, beginning where the Marlboro Branch moves west away from the road and**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**1,849**	**0**
Roads	**1,773**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**1,034**	**402**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **690**

Width Determination **Estimated**

Confinement Type **Broad**

Rock Gorge? **No**

Human-caused changed valley width? **Yes**

Notes:

A review of the historic topographic maps reveals that some time between 1935 and 1954 the river was moved toward the left valley wall in this reach. An old channel was noted near the left valley wall in some places during the assessment, in one case it is a current flood chute. Many point bars, abandoned channels and flood chutes. This reach is re-establishing meanders after having been straightened.

Step 2. Stream Channel

2.1 Bankfull Width	**70**
2.2 Max Depth (ft)	**2.90**
2.3 Mean Depth (ft)	**2.30**
2.4 Floodprone Width (ft)	**142**
2.5 Aband. Floodpln	**4.80**
2.6 Width/Depth Ratio	**30.43**
2.7 Entrenchment Ratio	**2.03**
2.8 Incision Ratio	**1.66**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**50**

2.12 Substrate Composition

Bedrock	**0**	%
Boulder	**9**	%
Cobble	**35**	%
Coarse Gravel	**23**	%
Fine Gravel	**16**	%
Sand	**17**	%

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **14**

2.13 Average Largest Particle on

Bed **17.0** **inches**

Bar **13.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Undercut**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**317**	**2,971**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**149**	**101**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**5-25**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Deciduous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Hay**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**Multiple**	**23.33**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
2	**10**	**15**

Diagonal	Delta	Island
5	**0**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
4	**0**	**1**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
5	**0**	**No**

5.4 Stream Ford or Animal **Yes**

5.5 Straightening **Yes**

Straightening Length: **7,981**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Marlboro Branch** Reach # **T02.05-S1.01** Segment: **0** Completion Date: **August 31, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **2,268** Segment Location: **Starts in South Newfane at the confluence with the Rock and continues south .44 miles**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**1,091**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**265**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft) **174**

Width Determination **Estimated**

Confinement Type **Narrow**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

A review of the historic topographic maps reveals that some time between 1935 and 1954 the river was moved toward the right valley wall in this reach. An old channel was noted near the left valley wall during the assessment. The reach is C riffle pool by reference and is currently a C plane bed due to aggradation. It is in stage IV of the F-stage channel evolution process with the dominant adjustment process being aggradation due to the loss of step-pool bed features.

Step 2. Stream Channel

2.1 Bankfull Width	**65**
2.2 Max Depth (ft)	**3.40**
2.3 Mean Depth (ft)	**2.27**
2.4 Floodprone Width (ft)	**174**
2.5 Aband. Floodpln	**5.90**
2.6 Width/Depth Ratio	**28.63**
2.7 Entrenchment Ratio	**2.68**
2.8 Incision Ratio	**1.74**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Sedimented**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**17** %
Cobble	**38** %
Coarse Gravel	**19** %
Fine Gravel	**4** %
Sand	**22** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **1**

2.13 Average Largest Particle on

Bed **16.0** **inches**

Bar **16.6** **inches**

2.14 Stream Type

Stream Type: **C**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Shallow**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**312**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**138**	**199**

Near Bank Veg. Type	Left	Right
Dominant	**Invasives**	**Invasives**
Sub-dominant	**Deciduous**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**51-75**	**76-100**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**26-50**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
0	**5**	**3**

Diagonal	Delta	Island
1	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **2,268**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.05** | Segment: **C** | Completion Date: **August 11, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, JC** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **2,651** | Segment Location: **South Newfane Village to covered bridge in Williamsville.**

Step 1. Valley and Floodplain

1.1 Segmentation **Planform and Scope**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**1,787**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**820**	**1,272**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Sometimes**
Texture	**Cobble**	**Cobble**

1.5 Valley Features

Valley Width (ft): **320**

Width Determination: **Estimated**

Confinement Type: **Narrow**

Rock Gorge?: **No**

Human-caused changed valley width?: **yes**

Notes:

The right bank is dominated by the road. There is one bridge that is a floodplain constriction with deposition below and scour above it.

The segment is a C riffle pool stream type currently and by reference. It is in good geomorphic condition and is in stage II of the F-stage channel evolution model with minor widening as the dominant adjustment process. The left bank provides critical floodplain along this straight segment.

Step 2. Stream Channel

2.1 Bankfull Width	**73**
2.2 Max Depth (ft)	**5.20**
2.3 Mean Depth (ft)	**3.70**
2.4 Floodprone Width (ft)	**169**
2.5 Aband. Floodpln	**8.10**
2.6 Width/Depth Ratio	**19.73**
2.7 Entrenchment Ratio	**2.31**
2.8 Incision Ratio	**1.56**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**168**

2.12 Substrate Composition

Bedrock	**4**	%
Boulder	**22**	%
Cobble	**29**	%
Coarse Gravel	**19**	%
Fine Gravel	**1**	%
Sand	**25**	%

Silt/Clay Present?: **No**

Detritus: **0** %

Large Woody: **2**

2.13 Average Largest Particle on

Bed **12.0** **inches**

Bar **8.0** **inches**

2.14 Stream Type

Stream Type: **C**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**143**	**192**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Rip-Rap**
Revetmt. Length (ft)	**164**	**204**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Shrubs/Saplin**
Sub-dominant	**None**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**76-100**	**1-25**

Mid-Channel Canopy: **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**5-25**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Herbaceous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
1	**0**	**5**

Diagonal	Delta	Island
1	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
1	**0**	**No**

5.4 Stream Ford or Animal: **No**

5.5 Straightening: **Yes**

Straightening Length: **2,480**

5.5 Dredging: **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.05** | Segment: **B** | Completion Date: **August 16, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, SH** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **1,101** | Segment Location: **In middle of reach at riprapped and over widened area adjacent to road.**

Step 1. Valley and Floodplain

1.1 Segmentation **Planform and Scope**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**1,121**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**861**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Sometimes**
Texture	**Sand**	**Sand**

1.5 Valley Features

Valley Width (ft)	**428**
Width Determination	**Estimated**
Confinement Type	**Semi-confined**
Rock Gorge?	**No**

Human-caused changed valley width? **yes**

Notes:

This reach is widening, eroding and aggrading. It used to be split by the road but was moved to the north channel between 1935 and 1954. It is extensively rip-rapped along the right bank for the road and is the first wide, bend in the river for 2,000 feet.

Step 2. Stream Channel

2.1 Bankfull Width	**128**
2.2 Max Depth (ft)	**5.00**
2.3 Mean Depth (ft)	**3.30**
2.4 Floodprone Width (ft)	**163**
2.5 Aband. Floodpln	**11.00**
2.6 Width/Depth Ratio	**38.79**
2.7 Entrenchment Ratio	**1.27**
2.8 Incision Ratio	**2.20**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Sedimented**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**19** %
Cobble	**48** %
Coarse Gravel	**17** %
Fine Gravel	**5** %
Sand	**11** %

Silt/Clay Present?	**No**
Detritus	**0** %
# Large Woody	**0**

2.13 Average Largest Particle on

Bed	**24.0**	**inches**
Bar	**15.0**	**inches**

2.14 Stream Type

Stream Type:	**F**
Bed Material:	**Cobble**
Subclass Slope:	**None**
Bed Form:	**Plane Bed**

2.15 Reference Stream Type
(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Undercut**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**638**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**Rip-Rap**
Revetmt. Length (ft)	**0**	**368**

Near Bank Veg. Type	Left	Right
Dominant	**Coniferous**	**Deciduous**
Sub-dominant	**Deciduous**	**None**

Bank Canopy	Left	Right
Canopy %	**51-75**	**51-75**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Deciduous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Residential**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
1	**0**	**0**

Diagonal	Delta	Island
0	**0**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
0	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
1	**0**	**No**

5.4 Stream Ford or Animal	**No**
5.5 Straightening	**Yes**
Straightening Length:	**977**
5.5 Dredging	**None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.05** | Segment: **A** | Completion Date: **August 11, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, JC** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **3,533** | Segment Location: **South Newfane village to covered bridge west of Williamsville.**

Step 1. Valley and Floodplain

1.1 Segmentation **Planform and Scope**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**863**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**835**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Sometimes**
Texture	**Cobble**	**Cobble**

1.5 Valley Features

Valley Width (ft)	**600**
Width Determination	**Estimated**
Confinement Type	**Broad**
Rock Gorge?	**No**

Human-caused changed valley width? **no**

Notes:

This reach was straightened between 1935 and 1954. It has few corridor encroachments and is in reference stream type with minor widening.

Step 2. Stream Channel

2.1 Bankfull Width	**73**
2.2 Max Depth (ft)	**5.20**
2.3 Mean Depth (ft)	**3.66**
2.4 Floodprone Width (ft)	**169**
2.5 Aband. Floodpln	**8.10**
2.6 Width/Depth Ratio	**19.95**
2.7 Entrenchment Ratio	**2.31**
2.8 Incision Ratio	**1.56**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**168**

2.12 Substrate Composition

Bedrock	**4** %
Boulder	**22** %
Cobble	**29** %
Coarse Gravel	**19** %
Fine Gravel	**1** %
Sand	**25** %

Silt/Clay Present?	**No**
Detritus	**0** %
# Large Woody	**2**

2.13 Average Largest Particle on

Bed	**12.0**	**inches**
Bar	**8.0**	**inches**

2.14 Stream Type

Stream Type:	**C**
Bed Material:	**Cobble**
Subclass Slope:	**None**
Bed Form:	**Riffle-Pool**

2.15 Reference Stream Type
(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**38**	**232**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**Rip-Rap**
Revetmt. Length (ft)	**0**	**304**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Shrubs/Saplin**
Sub-dominant	**None**	**Deciduous**

Bank Canopy	Left	Right
Canopy %	**76-100**	**1-25**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**5-25**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Herbaceous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**None**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
1	**0**	**5**

Diagonal	Delta	Island
1	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
0	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal	**No**
5.5 Straightening	**Yes**
Straightening Length:	**3,416**
5.5 Dredging	**None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.04** | Segment: **0** | Completion Date: **August 11, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, JC** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **2,582** | Segment Location: **From covered bridge west of Williamsville to village.**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**0**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**0**	**414**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Very Steep**
Continuous w/	**Always**	**Always**
W/in 1 Bankfill	**Always**	**Always**
Texture	**Sand**	**Cobble**

1.5 Valley Features

Valley Width (ft) **624**

Width Determination **Estimated**

Confinement Type **Broad**

Rock Gorge? **No**

Human-caused changed valley width? **no**

Notes:

There was a dredging violation on this reach in the 1990's. It is located just upstream of an old dam that was removed in the 1980's. There is an old channel on the left terrace. It is currently widening and undergoing planform adjustment.

Step 2. Stream Channel

2.1 Bankfull Width	**82**
2.2 Max Depth (ft)	**2.70**
2.3 Mean Depth (ft)	**1.90**
2.4 Floodprone Width (ft)	**133**
2.5 Aband. Floodpln	**4.90**
2.6 Width/Depth Ratio	**43.16**
2.7 Entrenchment Ratio	**1.62**
2.8 Incision Ratio	**1.81**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Eroded**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**11** %
Cobble	**37** %
Coarse Gravel	**16** %
Fine Gravel	**8** %
Sand	**28** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **7**

2.13 Average Largest Particle on

Bed **0.0**

Bar **0.0**

Not Evaluated

2.14 Stream Type

Stream Type: **F**

Bed Material: **Gravel**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**586**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**None**
Revetmt. Length (ft)	**176**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Coniferous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**26-50**	**26-50**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Forest**
Sub-dominant	**Residential**	**None**

	Amount	Mean Height
Mass Failures	**One**	**40.00**
Gullies	**Multiple**	**100.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Some**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
0	**0**	**5**

Diagonal	Delta	Island
1	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
0	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**Yes**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **1,018**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Rock River Main Stem** Reach # **T02.03** Segment: **0** Completion Date: **August 16, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC, SH** Why Not assessed: Rain: **Yes**

Segment Length (ft): **2,883** Segment Location: **In Village of Williamsville.**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **No**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**2,120**	**485**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**961**	**1,102**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Steep**	**Steep**
Continuous w/	**Sometimes**	**Always**
W/in 1 Bankfill	**Sometimes**	**Always**
Texture	**Cobble**	**Boulder**

1.5 Valley Features

Valley Width (ft) **103**

Width Determination **Measured**

Confinement Type **Narrowly**

Rock Gorge? **No**

Human-caused changed valley width? **yes**

Notes:

This reach was historically dammed until the 1980's when the dam was allowed to "dismantle naturally". It is still adjusting to the dam removal. There is a very wide area downstream of the dam site with two flood chutes that are accessed regularly. The main flow has been in the left most channel, grade controlled area, for at least 30 years (local interview).

Step 2. Stream Channel

2.1 Bankfull Width	**96**
2.2 Max Depth (ft)	**5.60**
2.3 Mean Depth (ft)	**3.10**
2.4 Floodprone Width (ft)	**103**
2.5 Aband. Floodpln	**5.60**
2.6 Width/Depth Ratio	**31.06**
2.7 Entrenchment Ratio	**1.07**
2.8 Incision Ratio	**1.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Eroded**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**9** %
Boulder	**32** %
Cobble	**36** %
Coarse Gravel	**13** %
Fine Gravel	**1** %
Sand	**9** %

Silt/Clay Present?	**No**
Detritus	**0** %
# Large Woody	**2**

2.13 Average Largest Particle on

Bed	**0.0**
Bar	**0.0**

Not Evaluated

2.14 Stream Type

Stream Type:	**F**
Bed Material:	**Cobble**
Subclass Slope:	**None**
Bed Form:	**Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Gravel**	**Gravel**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**63**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**None**
Revetmt. Length (ft)	**0**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Deciduous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**51-75**	**51-75**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Residential**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**One**	**50.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
1	**0**	**9**

Diagonal	Delta	Island
0	**0**	**0**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **581**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River**

Phase 2 Segment Summary

May 17, 2007 **FIT: Yes**

Stream: **Rock River Main Stem** Reach # **T02.02** Segment: **0** Completion Date: **August 10, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC** Why Not assessed: Rain: **Yes**

Segment Length (ft): **3,693** Segment Location: **Just east of Williamsville and Williamsville bridge.**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**0**	**0**
Roads	**3,515**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**281**	**638**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Flat**	**Flat**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Sometimes**
Texture	**Cobble**	**Cobble**

1.5 Valley Features

Valley Width (ft): **242**

Width Determination: **Measured**

Confinement Type: **Semi-confined**

Rock Gorge?: **No**

Human-caused changed valley width?: **yes**

Notes:

This reach is located downstream of the village of Williamsville in a semi-confined valley that is naturally straight. There is a gravel town road along the entire right bank and the left corridor is almost entirely mowed meadow though the stream bank is vegetated along both banks. It is aggrading with historic degradation and widening.

Step 2. Stream Channel

2.1 Bankfull Width	**96**
2.2 Max Depth (ft)	**3.00**
2.3 Mean Depth (ft)	**2.20**
2.4 Floodprone Width (ft)	**107**
2.5 Aband. Floodpln	**9.00**
2.6 Width/Depth Ratio	**43.64**
2.7 Entrenchment Ratio	**1.11**
2.8 Incision Ratio	**3.00**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Not Applicable**
2.11 Riffle/Step Spacing (ft)	**0**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**26** %
Cobble	**44** %
Coarse Gravel	**8** %
Fine Gravel	**12** %
Sand	**10** %

Silt/Clay Present?: **No**

Detritus: **0** %

Large Woody: **2**

2.13 Average Largest Particle on

Bed **N/A** **inches**

Bar **23.0** **inches**

2.14 Stream Type

Stream Type: **F**

Bed Material: **Cobble**

Subclass Slope: **None**

Bed Form: **Plane Bed**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Sand**	**Sand**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**0**	**0**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**None**	**None**
Revetmt. Length (ft)	**0**	**0**

Near Bank Veg. Type	Left	Right
Dominant	**Deciduous**	**Coniferous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**51-75**	**51-75**

Mid-Channel Canopy: **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**5-25**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Deciduous**	**Mixed Trees**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Hay**	**Forest**
Sub-dominant	**Forest**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**None**	**0.00**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Some**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
1	**0**	**4**

Diagonal	Delta	Island
0	**0**	**1**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
0	**0**	**No**

5.4 Stream Ford or Animal: **No**

5.5 Straightening: **No**

Straightening Length: **0**

5.5 Dredging: **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Project: **West River - Rock River** | **Phase 2 Segment Summary** | | May 17, 2007 | **FIT: Yes**

Stream: **Rock River Main Stem** | Reach # **T02.01** | Segment: **0** | Completion Date: **August 10, 2006**

Organization: **Landslide Natural Resource** | Observers: **ADS, JC** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **7,999** | Segment Location: **Williamsville Station 1.5 miles upstream.**

Step 1. Valley and Floodplain

1.1 Segmentation **None**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	**240**	**0**
Roads	**834**	**323**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**0**	**1,378**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Extremely**	**Very Steep**
Continuous w/	**Always**	**Sometimes**
W/in 1 Bankfill	**Always**	**Sometimes**
Texture	**Bedrock**	**Boulder**

1.5 Valley Features

Valley Width (ft) **191**

Width Determination **Measured**

Confinement Type **Semi-confined**

Rock Gorge? **No**

Human-caused changed valley width? **no**

Notes:

This reach is dominated by ledge outcrops that have created a series of deep pools (heavily used for swimming) and riffles. It historically incised, perhaps when the dam at T08.03 was present, and widened. It is currently aggrading. We saw a mink on 08/10/2006.

Step 2. Stream Channel

2.1 Bankfull Width	**115**
2.2 Max Depth (ft)	**3.40**
2.3 Mean Depth (ft)	**1.67**
2.4 Floodprone Width (ft)	**161**
2.5 Aband. Floodpln	**8.40**
2.6 Width/Depth Ratio	**68.86**
2.7 Entrenchment Ratio	**1.40**
2.8 Incision Ratio	**2.47**
2.9 Sinuosity	**Low**
2.10 Riffles Type	**Complete**
2.11 Riffle/Step Spacing (ft)	**274**

2.12 Substrate Composition

Bedrock	**1** %
Boulder	**31** %
Cobble	**38** %
Coarse Gravel	**17** %
Fine Gravel	**6** %
Sand	**7** %

Silt/Clay Present? **No**

Detritus **0** %

Large Woody **8**

2.13 Average Largest Particle on

Bed **24.0** **inches**

Bar **24.0** **inches**

2.14 Stream Type

Stream Type: **B**

Bed Material: **Cobble**

Subclass Slope: **c**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

Bank Texture	Left	Right
Upper		
Material Type	**Boulder/Cobbl**	**Boulder/Cobbl**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Boulder/Cobbl**	**Gravel**
Consistency	**Non-cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**0**	**241**
Erosion Height (ft)	**0.00**	**0.00**
Revetmt. Type	**Rip-Rap**	**Hard Bank**
Revetmt. Length (ft)	**483**	**256**

Near Bank Veg. Type	Left	Right
Dominant	**Coniferous**	**Coniferous**
Sub-dominant	**None**	**None**

Bank Canopy	Left	Right
Canopy %	**76-100**	**76-100**

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-dominant	**None**	**None**

Buffer Veg. Type	Left	Right
Dominant	**Coniferous**	**Coniferous**
Sub-dominant	**None**	**None**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**

	Amount	Mean Height
Mass Failures	**None**	**0.00**
Gullies	**Multiple**	**32.50**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	**Abundant**
4.2 Adjacent Wetlands	**None**
4.3 Flow Status	**Moderate**
4.4 # of Debris Jams	**0**
4.5 Impoundments	**None**
Impoundmt. Location	
4.6 # of Stormwater Inputs	**0**
4.7 Upstream Flow	**None**
4.9 # of Beaver Dams	**0**
Affected Length (ft)	**0**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
0	**0**	**10**

Diagonal	Delta	Island
0	**0**	**3**

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	**0**	**0**	**0**

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
6	**0**	**No**

5.4 Stream Ford or Animal **No**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **None**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 7.

Stream: **Baker Brook** Reach # **T2.03-S2.02** Segment: **0** Completion Date: **August 31, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **6,190** Segment Location: **Baker Brook, along Baker Brook Rd near Parish Hill Rd**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**37.0**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above**

Narrative:
Aggradation with historic degradation.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**C to F**	**Yes**
7.2 Channel Aggradation	**10**	**None**	**No**
7.3 Widening Channel	**13**		**Yes**
7.4 Change in Planform	**13**		**No**
Total Score	**41**		
Geomorphic Rating	**0.5125**		

Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Fair**
Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**11**
6.3 Velocity/Depth Patterns	**19**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**14**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 8 Right: 9**
6.9 Bank Vegetation Protection	**Left: 7 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 9**
Total Score	**145**
Habitat Rating	**0.725**

Habitat Stream Condition **Good**

Stream: **Baker Brook** Reach # **T2.03-S2.01** Segment: **0** Completion Date: **August 24, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **5,151** Segment Location: **Mouth of Baker Brook, Williamsville Village**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Mid-Segment**	**3.00**	**1.00**		
Ledge	**Mid-Segment**	**2.00**	**0.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**0.00**	**Yes**	**Yes**	**No**	**No**
Problem	**None**				
Bridge	**72.3**	**Yes**	**Yes**	**No**	**No**
Problem	**Deposition Above**				
Bridge	**48.8**	**Yes**	**Yes**	**No**	**No**
Problem	**Deposition Above,Deposition Below**				

Narrative:
Aggradation with historic degradation.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**B to F**	**Yes**
7.2 Channel Aggradation	**11**	**None**	**No**
7.3 Widening Channel	**13**		**Yes**
7.4 Change in Planform	**15**		**No**
Total Score	**44**		
Geomorphic Rating	**0.55**		

Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Fair**
Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**14**
6.2 Embeddedness	**8**
6.3 Velocity/Depth Patterns	**17**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**16**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 7 Right: 7**
6.9 Bank Vegetation Protection	**Left: 7 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 10**
Total Score	**131**
Habitat Rating	**0.655**

Habitat Stream Condition **Good**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**32.6**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				
Bridge	**21.3**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below**				
Bridge	**33.6**	**Yes**	**Yes**	**No**	**Yes**
Problem	**Deposition Above,Deposition Below**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**C to F**	**Yes**
7.2 Channel Aggradation	**11**	**None**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**8**		**No**
Total Score	**38**		
Geomorphic Rating	**0.475**		

Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Fair**
Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**7**
6.2 Embeddedness	**6**
6.3 Velocity/Depth Patterns	**7**
6.4 Sediment Deposition	**9**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**12**
6.7 Frequency of Riffles/Steps	**6**
6.8 Bank Stability	**Left: 5 Right: 6**
6.9 Bank Vegetation Protection	**Left: 9 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 8**
Total Score	**99**
Habitat Rating	**0.495**

Habitat Stream Condition **Fair**

Narrative:
Planform with minor aggradation & historic degradation.

Stream: **Taft Brook** Reach # **T02.11-S1.01** Segment: **C** Completion Date: **August 23, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **4,038** Segment Location: **U/S from horse farm to end of reach.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Upstream**	**7.00**	**6.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**11.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				
Instream	**4.60**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below,Scour**				
Instream	**2.90**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**B to F**	**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**8**		**No**
Total Score	**41**		
Geomorphic Rating	**0.5125**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**12**
6.3 Velocity/Depth Patterns	**15**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**9**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 6 Right: 4**
6.9 Bank Vegetation Protection	**Left: 5 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 8**
Total Score	**125**
Habitat Rating	**0.625**

Habitat Stream Condition **Fair**

Narrative:

Planform with historic degradation is the dominant adjustment process.

Stream: **Taft Brook** Reach # **T02.11-S1.01** Segment: **B** Completion Date: **August 23, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **2,749** Segment Location: **Mid-segment grade control to u/s of farm opening on road.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Mid-Segment**	**6.00**	**4.00**		
Ledge	**Mid-Segment**	**5.00**	**4.00**		
Ledge	**Mid-Segment**	**4.00**	**3.00**		
Ledge	**Mid-Segment**	**2.00**	**1.00**		
Ledge	**Mid-Segment**	**0.00**	**0.00**		
Ledge	**Mid-Segment**	**4.00**	**2.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**24.2**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**15**	**None**	**No**
7.2 Channel Aggradation	**10**	**Other**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**13**		**No**
Total Score	**52**		
Geomorphic Rating	**0.65**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Good**

Stream Sensitivity **Very High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**5**
6.2 Embeddedness	**7**
6.3 Velocity/Depth Patterns	**8**
6.4 Sediment Deposition	**7**
6.5 Channel Flow Status	**9**
6.6 Channel Alteration	**20**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 8 Right: 3**
6.9 Bank Vegetation Protection	**Left: 8 Right: 5**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 6**
Total Score	**101**
Habitat Rating	**0.505**

Habitat Stream Condition **Fair**

Narrative:

Stream type departure B to Cb. Aggradation is the dominant adjustment process and is compounded by a debris jam at the down stream end of the reach and major erosion at the farm at the upstream end of the reach.

Stream: **Taft Brook** Reach # **T02.11-S1.01** Segment: **A** Completion Date: **August 23, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **4,571** Segment Location: **First reach of Taft west of East Dover.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPS Taken
Ledge	**Downstream**	**7.00**	**5.00**	**Yes**	**Yes**
Ledge	**Downstream**	**8.00**	**5.00**	**Yes**	**Yes**
Ledge	**Downstream**	**3.00**	**2.00**	**Yes**	**Yes**

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**7.00**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below,Scour**				
Instream	**8.20**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below**				
Instream	**7.00**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below**				
Instream	**8.10**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below**				
Bridge	**21.4**	**Yes**	**Yes**	**No**	**No**
Problem	**Deposition Above,Deposition Below,Scour**				
Instream	**6.50**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Scour Above**				

Narrative:

Planform with historic degradation is the dominant adjustment process.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**B to F**	**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**8**		**No**
Total Score	**41**		
Geomorphic Rating	**0.5125**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**12**
6.3 Velocity/Depth Patterns	**15**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**9**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 6 Right: 4**
6.9 Bank Vegetation Protection	**Left: 5 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 8**
Total Score	**125**
Habitat Rating	**0.625**

Habitat Stream Condition **Fair**

Stream: **Rock River Main Stem** Reach # **T02.11** Segment: **0** Completion Date: **August 30, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **3,873** Segment Location: **Rock River main stem, between Brookside and East Dover**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Dam	**Downstream**	**10.00**	**4.00**		
Ledge	**Downstream**	**6.00**	**3.00**		
Ledge	**Downstream**	**6.00**	**4.00**		
Ledge	**Downstream**	**5.00**	**2.00**		
Ledge	**Downstream**	**3.00**	**2.00**		
Ledge	**Downstream**	**4.00**	**2.00**		
Ledge	**Downstream**	**6.00**	**2.00**		
Ledge	**Downstream**	**6.00**	**3.00**		
Ledge	**Upstream**	**16.00**	**11.00**		
Ledge	**Upstream**	**4.00**	**2.00**		

4.6 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Instream	**23.4**	**Yes**	**Yes**	**Yes**	**Yes**

Problem **None**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**None**	**No**
7.2 Channel Aggradation	**14**	**None**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**16**		**No**
Total Score	**49**		
Geomorphic Rating	**0.6125**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**9**
6.3 Velocity/Depth Patterns	**20**
6.4 Sediment Deposition	**8**
6.5 Channel Flow Status	**13**
6.6 Channel Alteration	**19**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 7 Right: 8**
6.9 Bank Vegetation Protection	**Left: 9 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 10**
Total Score	**155**
Habitat Rating	**0.775**

Habitat Stream Condition **Good**

Narrative:

Aggradation with historic degradation is the dominant adjustment process.

Stream: **Rock River Main Stem** Reach # **T02.10** Segment: **0** Completion Date: **August 30, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **2,245** Segment Location: **Rock River main stem through Brookside.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**52.0**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**B to F**	**Yes**
7.2 Channel Aggradation	**13**	**None**	**No**
7.3 Widening Channel	**13**		**No**
7.4 Change in Planform	**11**		**No**
Total Score	**42**		
Geomorphic Rating	**0.525**		

Channel Evolution Model **F**

Channel Evolution Stage **III**

Geomorphic Condition **Fair**

Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**17**
6.2 Embeddedness	**14**
6.3 Velocity/Depth Patterns	**16**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**10**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 9 Right: 5**
6.9 Bank Vegetation Protection	**Left: 6 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 6**
Total Score	**144**
Habitat Rating	**0.72**

Habitat Stream Condition **Good**

Narrative:

Planform with historic degradation is the dominant adjustment process.

Stream: **Rock River Main Stem** Reach # **T02.09** Segment: **0** Completion Date: **August 18, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **No**

Segment Length (ft): **4,506** Segment Location: **Rock River main stem, below Brookside**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**92.0**	**Yes**	**Yes**	**No**	**No**
Problem	**Deposition Above,Deposition Below**				
Bridge	**220.**	**Yes**	**Yes**	**No**	**No**
Problem	**Deposition Above,Deposition Below**				

Narrative:
Aggradation with historic widening.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**None**	**Yes**
7.2 Channel Aggradation	**10**	**None**	**No**
7.3 Widening Channel	**10**		**Yes**
7.4 Change in Planform	**13**		**No**
Total Score	**38**		
Geomorphic Rating	**0.475**		

Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Fair**
Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**10**
6.2 Embeddedness	**13**
6.3 Velocity/Depth Patterns	**9**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 6 Right: 4**
6.9 Bank Vegetation Protection	**Left: 7 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 3 Right: 8**
Total Score	**124**
Habitat Rating	**0.62**

Habitat Stream Condition **Fair**

Stream: **Rock River Main Stem** Reach # **T02.08** Segment: **0** Completion Date: **August 17, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **No**

Segment Length (ft): **1,781** Segment Location: **Rock River main stem, along Dover Rd, ending just u/s from trib T2.08-S1.01 that**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**None**	**Yes**
7.2 Channel Aggradation	**5**	**None**	**No**
7.3 Widening Channel	**11**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**36**		
Geomorphic Rating	**0.45**		

Channel Evolution Model	**F**
Channel Evolution Stage	**IV**
Geomorphic Condition	**Fair**
Stream Sensitivity	**High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**3**
6.2 Embeddedness	**9**
6.3 Velocity/Depth Patterns	**9**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**9**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 10 Right: 6**
6.10 Riparian Vegetation Zone Width	**Left: 1 Right: 8**
Total Score	**99**
Habitat Rating	**0.495**

Habitat Stream Condition **Fair**

Narrative:

Aggradation is the dominant adjustment process.

Stream: **Rock River Main Stem** Reach # **T02.07** Segment: **0** Completion Date: **August 18, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **No**

Segment Length (ft): **3,802** Segment Location: **Rock River main stem, along Dover Rd, beginning at Stratton Hill Rd. and continuing .7**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**38.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Below,Scour Above,Scour**				

Narrative:

Planform is the dominant adjustment process.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**C to F**	**Yes**
7.2 Channel Aggradation	**14**	**None**	**No**
7.3 Widening Channel	**11**		**No**
7.4 Change in Planform	**10**		**No**
Total Score	**48**		
Geomorphic Rating	**0.6**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **Very High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**3**
6.2 Embeddedness	**11**
6.3 Velocity/Depth Patterns	**8**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**12**
6.7 Frequency of Riffles/Steps	**4**
6.8 Bank Stability	**Left: 9 Right: 10**
6.9 Bank Vegetation Protection	**Left: 10 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 10**
Total Score	**122**
Habitat Rating	**0.61**

Habitat Stream Condition **Fair**

Stream: **Rock River Main Stem** Reach # **T02.06** Segment: **B** Completion Date: **August 17, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **No**

Segment Length (ft): **1,428** Segment Location: **Southwest of Deer Hill, ends at Stratton Hill Road.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Narrative:
Minor aggradation.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**Yes**
7.2 Channel Aggradation	**15**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**16**		**No**
Total Score	**60**		
Geomorphic Rating	**0.75**		

Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Good**
Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**3**
6.2 Embeddedness	**12**
6.3 Velocity/Depth Patterns	**9**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**4**
6.8 Bank Stability	**Left: 6 Right: 8**
6.9 Bank Vegetation Protection	**Left: 10 Right: 8**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 2**
Total Score	**107**
Habitat Rating	**0.535**

Habitat Stream Condition **Fair**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Narrative:
Planform.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**C to F**	**Yes**
7.2 Channel Aggradation	**11**	**None**	**No**
7.3 Widening Channel	**10**		**No**
7.4 Change in Planform	**5**		**No**
Total Score	**31**		
Geomorphic Rating	**0.3875**		
Channel Evolution Model	**F**		
Channel Evolution Stage	**IV**		
Geomorphic Condition	**Fair**		
Stream Sensitivity	**Extreme**		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**4**
6.2 Embeddedness	**13**
6.3 Velocity/Depth Patterns	**12**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**7**
6.8 Bank Stability	**Left: 3 Right: 7**
6.9 Bank Vegetation Protection	**Left: 9 Right: 8**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 4**
Total Score	**117**
Habitat Rating	**0.585**
Habitat Stream Condition	**Fair**

Stream: **Marlboro Branch** Reach # **T02.05-S1.05** Segment: **0** Completion Date: **September 7,**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **5,876** Segment Location: **From just past the confluence with Adam's Brook 1.1 miles to just past the conluence**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock Problem	**0.00**	**No**	**No**	**Yes**	**Yes**
Bedrock Problem	**0.00**	**No**	**No**	**Yes**	**Yes**
Bedrock Problem	**0.00**	**No**	**No**	**Yes**	**Yes**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**10**		**No**
Total Score	**54**		
Geomorphic Rating	**0.675**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Good**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**14**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**19**
6.4 Sediment Deposition	**13**
6.5 Channel Flow Status	**14**
6.6 Channel Alteration	**8**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 6 Right: 5**
6.9 Bank Vegetation Protection	**Left: 8 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 10**
Total Score	**143**
Habitat Rating	**0.715**

Habitat Stream Condition **Good**

Narrative:

Planform with historic degradation and widening.

Stream: **Marlboro Branch** Reach # **T02.05-S1.04** Segment: **0** Completion Date: **September 7,**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **2,372** Segment Location: **Continues along Augerhole Road after Lahar Rd. heads south for .45 miles to just after**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**50.3**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Below**

Narrative:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**No**
7.2 Channel Aggradation	**13**	**None**	**No**
7.3 Widening Channel	**13**		**No**
7.4 Change in Planform	**13**		**No**
Total Score	**52**		
Geomorphic Rating	**0.65**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Good**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**12**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**16**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 6 Right: 7**
6.9 Bank Vegetation Protection	**Left: 9 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 8**
Total Score	**151**
Habitat Rating	**0.755**

Habitat Stream Condition **Good**

Stream: **Marlboro Branch** Reach # **T02.05-S1.03** Segment: **0** Completion Date: **September 6,**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **6,788** Segment Location: **From the confluence with the Gulf Brook, the reach continues south 1.3 miles to the**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**57.7**	**Yes**	**Yes**	**No**	**Yes**
Problem	**Deposition Above**				
Bridge	**48.5**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				

Narrative:

Planform and widening are the major adjustments.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**C to F**	**Yes**
7.2 Channel Aggradation	**11**	**None**	**No**
7.3 Widening Channel	**10**		**No**
7.4 Change in Planform	**10**		**No**
Total Score	**36**		
Geomorphic Rating	**0.45**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**18**
6.2 Embeddedness	**13**
6.3 Velocity/Depth Patterns	**17**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**8**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 8 Right: 6**
6.9 Bank Vegetation Protection	**Left: 9 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 6 Right: 9**
Total Score	**153**
Habitat Rating	**0.765**

Habitat Stream Condition **Good**

Stream: **Marlboro Branch** Reach # **T02.05-S1.02** Segment: **0** Completion Date: **September 1,**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **8,326** Segment Location: **1.6 miles long, beginning where the Marlboro Branch moves west away from the road**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**56.0**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**12**	**None**	**No**
7.2 Channel Aggradation	**13**	**None**	**No**
7.3 Widening Channel	**9**		**No**
7.4 Change in Planform	**9**		**No**

Total Score **43**

Geomorphic Rating **0.5375**

Channel Evolution Model **F**

Channel Evolution Stage **III**

Geomorphic Condition **Fair**

Stream Sensitivity **Very High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**14**
6.2 Embeddedness	**10**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**8**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**12**
6.7 Frequency of Riffles/Steps	**20**
6.8 Bank Stability	**Left: 4 Right: 6**
6.9 Bank Vegetation Protection	**Left: 10 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 6**
Total Score	**138**
Habitat Rating	**0.69**

Habitat Stream Condition **Good**

Narrative:

Entrenched, widening and migrating laterally through bank erosion.

Stream: **Marlboro Branch** Reach # **T02.05-S1.01** Segment: **0** Completion Date: **August 31, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, CH** Rain: **Yes**

Segment Length (ft): **2,268** Segment Location: **Starts in South Newfane at the confluence with the Rock and continues south .44 miles**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**133.**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**Yes**
7.2 Channel Aggradation	**13**	**Other**	**No**
7.3 Widening Channel	**13**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**54**		
Geomorphic Rating	**0.675**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Good**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**10**
6.2 Embeddedness	**12**
6.3 Velocity/Depth Patterns	**17**
6.4 Sediment Deposition	**13**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**16**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 7 Right: 9**
6.9 Bank Vegetation Protection	**Left: 6 Right: 6**
6.10 Riparian Vegetation Zone Width	**Left: 7 Right: 5**
Total Score	**128**
Habitat Rating	**0.64**

Habitat Stream Condition **Fair**

Narrative:

Addradation is the dominant adjustment process.

Stream: **Rock River Main Stem** Reach # **T02.05** Segment: **C** Completion Date: **August 11, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC** Rain: **Yes**

Segment Length (ft): **2,651** Segment Location: **South Newfane Village to covered bridge in Williamsville.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**149.**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**No**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**13**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**57**		
Geomorphic Rating	**0.7125**		

Channel Evolution Model **F**

Channel Evolution Stage **I**

Geomorphic Condition **Good**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**15**
6.2 Embeddedness	**14**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 9 Right: 8**
6.9 Bank Vegetation Protection	**Left: 8 Right: 7**
6.10 Riparian Vegetation Zone Width	**Left: 4 Right: 2**
Total Score	**145**
Habitat Rating	**0.725**

Habitat Stream Condition **Good**

Narrative:

Minor widening and degradation are the dominant adjustment processes.

Stream: **Rock River Main Stem** Reach # **T02.05** Segment: **B** Completion Date: **August 16, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, SH** Rain: **Yes**

Segment Length (ft): **1,101** Segment Location: **In middle of reach at riprapped and over widened area adjacent to road.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Narrative:

Planform is the dominant adjustment process.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**C to F**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**8**		**No**
Total Score	**48**		
Geomorphic Rating	**0.6**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**10**
6.2 Embeddedness	**16**
6.3 Velocity/Depth Patterns	**10**
6.4 Sediment Deposition	**6**
6.5 Channel Flow Status	**9**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 4 Right: 9**
6.9 Bank Vegetation Protection	**Left: 9 Right: 4**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 3**
Total Score	**109**
Habitat Rating	**0.545**

Habitat Stream Condition **Fair**

Stream: **Rock River Main Stem** Reach # **T02.05** Segment: **A** Completion Date: **August 11, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC** Rain: **Yes**

Segment Length (ft): **3,533** Segment Location: **South Newfane village to covered bridge west of Williamsville.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Narrative:
Minor degradation and widening.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**No**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**13**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**57**		
Geomorphic Rating	**0.7125**		

Channel Evolution Model	**F**
Channel Evolution Stage	**I**
Geomorphic Condition	**Good**
Stream Sensitivity	**Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**15**
6.2 Embeddedness	**14**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 9 Right: 8**
6.9 Bank Vegetation Protection	**Left: 8 Right: 7**
6.10 Riparian Vegetation Zone Width	**Left: 4 Right: 2**
Total Score	**145**
Habitat Rating	**0.725**

Habitat Stream Condition **Good**

Stream: **Rock River Main Stem** Reach # **T02.04** Segment: **0** Completion Date: **August 11, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC** Rain: **Yes**

Segment Length (ft): **2,582** Segment Location: **From covered bridge west of Williamsville to village.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**87.5**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**10**	**C to F**	**Yes**
7.2 Channel Aggradation	**11**	**None**	**No**
7.3 Widening Channel	**9**		**No**
7.4 Change in Planform	**9**		**No**
Total Score	**39**		
Geomorphic Rating	**0.4875**		

Channel Evolution Model **F**

Channel Evolution Stage **III**

Geomorphic Condition **Fair**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**14**
6.3 Velocity/Depth Patterns	**16**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**11**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**15**
6.8 Bank Stability	**Left: 7 Right: 7**
6.9 Bank Vegetation Protection	**Left: 7 Right: 7**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 8**
Total Score	**141**
Habitat Rating	**0.705**

Habitat Stream Condition **Good**

Narrative:

Planform and widening are the dominant adjustment processes.

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Downstream**	**9.00**	**5.00**		
Ledge	**Mid-Segment**	**5.00**	**2.00**		
Ledge	**Upstream**	**6.00**	**2.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**76.0**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**C to F**	**Yes**
7.2 Channel Aggradation	**10**	**None**	**No**
7.3 Widening Channel	**16**		**No**
7.4 Change in Planform	**10**		**No**
Total Score	**41**		
Geomorphic Rating	**0.5125**		

Channel Evolution Model **F**
Channel Evolution Stage **IV**
Geomorphic Condition **Fair**
Stream Sensitivity **Extreme**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**10**
6.2 Embeddedness	**16**
6.3 Velocity/Depth Patterns	**10**
6.4 Sediment Deposition	**10**
6.5 Channel Flow Status	**9**
6.6 Channel Alteration	**16**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 7 Right: 7**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 7 Right: 7**
Total Score	**122**
Habitat Rating	**0.61**

Habitat Stream Condition **Good**

Narrative:
Aggradation and planform are the dominant adjustment processes on this reach.

Stream: **Rock River Main Stem** Reach # **T02.02** Segment: **0** Completion Date: **August 10, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC** Rain: **Yes**

Segment Length (ft): **3,693** Segment Location: **Just east of Williamsville and Williamsville bridge.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Upstream**	**15.00**	**11.00**		

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Plane Bed**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**C to F**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**10**		**Yes**
7.4 Change in Planform	**17**		**No**
Total Score	**44**		
Geomorphic Rating	**0.55**		
Channel Evolution Model	**F**		
Channel Evolution Stage	**IV**		
Geomorphic Condition	**Fair**		
Stream Sensitivity	**Very High**		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**11**
6.2 Embeddedness	**18**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**11**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**5**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 10 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 4 Right: 4**
Total Score	**133**
Habitat Rating	**0.665**
Habitat Stream Condition	**Good**

Narrative:

The reach is in minor aggradation with historic degradation and widening.

Stream: **Rock River Main Stem** Reach # **T02.01** Segment: **0** Completion Date: **August 10, 2006**

Organization: **Landslide Natural Resource** Observers: **ADS, JC** Rain: **Yes**

Segment Length (ft): **7,999** Segment Location: **Williamsville Station 1.5 miles upstream.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**150.**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**8**		**Yes**
7.4 Change in Planform	**13**		**No**
Total Score	**38**		
Geomorphic Rating	**0.475**		

Channel Evolution Model **F**

Channel Evolution Stage **IV**

Geomorphic Condition **Fair**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**15**
6.2 Embeddedness	**18**
6.3 Velocity/Depth Patterns	**19**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**11**
6.6 Channel Alteration	**19**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 9 Right: 7**
6.9 Bank Vegetation Protection	**Left: 9 Right: 7**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 6**
Total Score	**158**
Habitat Rating	**0.79**

Habitat Stream Condition **Good**

Narrative:

The reach is aggrading with historic degradation and widening.

Rock River Phase 2 Stream Geomorphic Assessment

Appendix C – Data CD

Rock River Phase 2 Stream Geomorphic Assessment

Appendix D – QA/QC Report

Phase 2 Quality Assurance Worksheet

Stream Name Rock River **Watershed** West River **Date** 18-May-07
QA Team Leader Amy Sheldon **Organization/A** Landslide, Inc.
ANR Team Leader Shannon Pytlik

Check one or more boxes to indicate the types of ANR sponsored training received by field team members.	**Phase 2**	✓	Segment/Reach sketch and map documentation completed	✓
	QA		Phase 1 Assessment used in Phase 2	✓
			ANR SGA Handbook Protocols and Databases used exclusively.	✓
			Other protocols used.	None

Phase 1 Step Number	Tool used to Collect Data	Confidence Level	Date Complete	Date Udated	Date of Local QA Team Review	Date of State QA Review	Comments
Step 1	Visual observations; tape measure; rod	High	Sept. 2006		January, 2007	February, 2007	
Step 2	Observations, rod, tape, ruler, digital camera.	High	Sept. 2006		January, 2007	February, 2007	See QA/QC report regarding RAF & glacial terraces.
Step 3	Visual observations.	High	Sept. 2006		January, 2007	February, 2007	Height of eroding banks was not collected.
Step 4	GPS, digital camera, visual obs.	High	Sept. 2006		January, 2007	February, 2007	
Step 5	Visual obs.	High	Sept. 2006		January, 2007	February, 2007	
Step 6	Visual obs.	High	Sept. 2006		January, 2007	February, 2007	
Step 7	Visual obs.	High	Sept. 2006		January, 2007	February, 2007	

MEMORANDUM

TO: Amy Sheldon, Landslide Natural Resource Planning

FR: Shannon Pytlik, Agency of Natural Resources, River Management Section

DATE: February 25, 2007

RE: **Rock River Phase 2 QA Report**

Hi Amy – The project wide general comments are on the first pages. Reach specific comments on following pages.

No dredging is noted in the entire data set for the Rock River. The Phase 1 report notes that the mainstem was dredged and one specific site on the mainstem just upstream of Williamsville (seems like T2.04), yet nothing is indexed in Phase 2?

The only reach that I have information for dredging is T2.04 and that is from an interview. I did not see "evidence of removal of sediments and other material from the channel"(P55 of P2 Protocols) or I would have noted it.

We look for brief notes describing the reach and a SGA narrative. Only a few reaches have adequate notes to get an idea of what is going on or any peculiarities.

I have these in the draft report and will add them to the DMS.

In general the cross sections did not extend far enough into the valley to characterize the streams relationship with old terraces and the valley walls.

I have added valley walls and terraces.

Recently Abandoned Floodplain seems to be an issue in this data set. Recently abandoned floodplains are not shown as a feature on cross sections and should be since they are a major feature in the SGA. This is one of the most important pieces of data collected during the Phase 2. A lot of the data is based on this number and how it relates to the bankful elevation.

Do you have this data in your paper copy of the cross sections?
I have reviewed the RAF's extensively on my own and with you. I have added them to the cross sections and made changes as noted below. I am looking forward to a field visit with you and George this spring to evaluate the RAF's.

Can it be added to the cross sections?
Yes. It is done.

In most of the reaches I noticed you had the RAF the same as the "bank height" in the cross section. These are not the same thing. You can have no RAF and then it is the same as the

bankful elevation, resulting in a incision ratio of 1. You will have to re-evaluate all of RAF and see if that impacts the Degradation scores.

How confident are you on your bankful elevations and your RAF's?
I am very confident in my field measurements. I spent a day with you early on in my field work (August 16th) on the Rock and you and I did cross sections together on T2.01, T2.03, T2.05B. I also spent two days in the field with Ty later in the summer on the New Haven Tribs and my measurements were not corrected or questioned by either of you at the time they were taken.

A lot hinge on these numbers and you seem to have a lot of incision and STD's to F's. It is certainly possible, but I want to make sure you are confident in this representation of the watershed. The RAF's specifically make me nervous because they coincide with your TOB and they don't always in reality. Maybe we need to do a field day and go back and double check some of the cross sections?
We have discussed this issue extensively. In general, this river is very wide and has very likely experienced a great deal of channel moving, which would result in incision. I have looked at historical topographic maps and there are numerous places the river was pushed to the side of the valley. I will include these maps in my report. Also – upon further consideration, I think the road bed has been raised in a number of places where we have changed the RAF to BFK. The valleys are generally narrow and the roads are often adjacent to the stream.

I wonder how much of the incision is recent and how much was due to the stream cutting through the glacial fluvial soils thousands of years ago. Especially since they appear to be fairly stable with no erosion. Did you look into the glacial history for the region? Are there old glacial terraces in this basin that you were confusing with the RAF?
I have looked at the source material for the soils in the river corridors. There is a fair amount of alluvium in the valleys.

When to select poor for the overall adjustment: In order for the RGA to be forced to poor you have to have BOTH the highlighted boxes checked, except for Degradation in which case you only need one. This is a problem on a lot of reaches where you had poor for only one of the top 2 boxes and selected 5 as the score. These will all have to be re-evaluated.
I did think these were the same (only one poor = poor overall). A note on the field form would help a lot (EITHER on the line between the first two steps for degradation and BOTH on the line between the first two steps for the rest would be a helpful reminder. I have made the necessary changes.

I noticed you have NA noted for riffle types on F stream types (T2.07 & T2.08, maybe others?). I would expect the riffles to be eroded. They certainly area applicable on reference c stream types.
I have checked them all and made appropriate changes. Thank you.

Pebble counts don't work the way you entered them into the spreadsheet. Data should either be collected with all of the categories or not entered into the spreadsheet.
This was suggested by either Shayne or Ty in your absence as the best way to enter the data. I have deleted the pebble count data from the cross section worksheets.

Reach Specific Comments

T02.01

Since this stream is incised and wide it should be in stage 3 or 4 of CEM.
I have changed it to IV since there are numerous side bars, steep riffles, two flood chutes and three islands. Aggradation is the current dominant adjustment process.

Cross sections do not extend far enough into the valley to get an idea of entrenchment and relationship with the valley. If the 9.4 is the low bank height than is that a flat terrace? Yes. If it is then you will need to have the cross section extend beyond that point to show the feature. I have added it. You have 9.4 as both the TOB and RAF? How was this low bank height selected? Is it a feature that the stream use to access at bankful and now does not access? Yes. You might recall it was the trail/old road bed that we walked to the site on. The valley wall is adjacent to it. The left bank is the valley wall.

Head cuts indicate active incision, yet you indicate historic?
These are all steep riffles, not head cuts.

Based on the incision ratio I would call this an F stream type and have a STD of C to F.
With entrenchment coming in at 1.4 and reference stream type being a B, I kept it B.

What evidence do you have that the stream would be a plane bed by reference? Maybe the Phase 1 ST was wrong and should be updated.
I already changed reference to riffle pool. I'm not sure what data you are looking at but I just double checked the DMS and it has P1 and P2 as riffle pool.

T2.02

What is the human caused change in valley width? This is only applicable where the valley is reduced by a human made feature in the valley.
There is a town road to year round houses along the entire right bank of this reach.

You have this reach as actively widening in stage III with no erosion. Is this possible?
No. The widening is historic. I have changed it to stage IV.

Where is the RAF in the cross section? If this is a feature then it should be in the cross section. I have added the RAF to the cross section. Right top of bank is a low terrace with houses and a road on it that the stream does not access it at this time.

How was this number determined?
It is the low terrace that the stream is not accessing today.

T2.03

An incision ratio of almost 2 in reference condition for degradation is inconsistent.
You and I did this cross section together. There is a note saying "NO RAF" and bankful has been entered.

Planform of 5 with practically no erosion? You say "low to moderate" for erosion in Planform RGA, yet practically none indexed? Maybe this is a typo because you have Good, Poor, Reference, Reference and yet it is a 5?
Same error with the little black boxes at the top of the form – I thought one put it into poor. The number is adjusted in the DMS.

What is the human caused change in valley width?
The road.

This is a C in Phase 1 and you have it as an F in Phase 2, yet no STD? Is this a reference F? If so it needs to change in the Phase 1 DMS. I see your note that it may be a reference F, either change the Phase 1 to an F or have a STD in Phase 2 so they are consistent. Whichever one you decide is more accurate for this reach.
I think this is reference C that is in major adjustment from having been dammed. It is currently over-widened, aggrading and has two big flood chutes

Again, how was the RAF determined? On this reach it corresponds with the FPA (it does?) but they are very different pieces of data. Is this an abandoned terrace that is just not shown on the cross section?
We determined out in the field that there was no RAF on this reach. It has been corrected.

Dredging noted in Phase 1 data for this reach.
I did not see "evidence of removal of sediments and other material from the channel"(P55 of P2 Protocols) or I would have noted it.

T02.04
The entrenchment has a +/- 0.2 so this could be an F as well. What made you decide on a B?
I made this a B because the reach is moderately entrenched, not entrenched but after our conversation, I am good with our change to F.

For RGA Widening Row 1, why didn't you sent poor since the w/d ratio is 48? Why did you select 5 with a good, fair, fair, fair, reference? None of them are in poor and yet you select poor? Maybe the Row 1 is a typo and you meant to select poor?
Same error with the little black boxes at the top of the form – I thought one put it into poor. The number is adjusted in the DMS. The Geomorphic Assessment was also changed for Planform for the same reason.

If the stream has incised it cannot be the D CEM. This STD was created to explain systems that do not go through the F CEM due to some bed resistance.
I used the D model because I'm thinking it was a C that went to B, is wide and moderately entrenched. Perhaps the language in Appendix C "Channel Evolution Models" could be changed from "In some situations" to something more definitive if the direction for its use as it relates to bed resistance is that strong. I changed it to F III.
With both widening and planform in poor I would expect more erosion.
23% of the left bank is eroding and there are two gullies and a mass failure.

T02.05A
What is the human caused change in valley width.
None for this segment – it is changed in the DMS.

T02.05B
What is the human caused change in valley width.
The road.

What is the "other" aggradation STD?
Step 7.2 in the DMS has none for STD. I'm not sure what you're referring to.
Planform score changed to 8 from 5.

T02.05C
On the reports I printed a while ago the constriction is noted on A, but in the DMS is it now under C. Is this something you fixed? I just checked and it is already fixed – thanks!

T02.05-S1.01
What is the other for STD? This should be in the notes.
Riffle pool to plane bed.

Why did you select 5 for the aggradation when you have Poor, G, R, G, R, G?
Same error with the little black boxes at the top of the form – I thought one put it into poor. The number is adjusted to 15 in the DMS.

Abandoned floodplain not shown in the cross section as a bench. Where did this number come from?
It is now labeled on the cross section.

T02.05-S1.02
Why the D CEM? Looks like F, I to me.
Changed to III as it is entrenched, widening, and migrating laterally.

Great cross section, this is what we are looking for. Except we also need the abandoned floodplain noted in the cross section. Again, it does not show up as a bench or anything. What is this feature?
LTOB – it is now labeled.
Cross section listed as "A" in excel. This could be confusing in the future can you change it to 0?
No. The spreadsheet is locked with segments pre-set.

What is an "hx cchannel"?
Abandoned channel.

T02.05-S1.03
Why the D CEM? Looks like F, I to me.

I have a IV F on my data sheet and in the SGA. This has a stream type departure C to F with aggradation and planform as the dominant adjustment processes.

I would call this an F stream type since the entrenchment has a +/- 0.2.
Changed.

Head cut indicates active incision.
These are all steep riffles.

Seems like you may be using the "bank height" as the RAF elevation? These are not the same thing.
In this case, there is a distinct RAF which is now labeled on the cross section.

Cross section says "A" yet no B, should be 0.
The spreadsheet is locked with segments pre-set.

Dredging noted in Phase 1 data for this reach.
I would like to know what indicators you are looking for for dredging. I saw no evidence of bar scalping or equipment in the channel.

T02.05-S1.04
Cross section says "A" yet no B, should be 0.
The spreadsheet is locked with segments pre-set.

Again, the bank height is not the same as the RAF!
In this case, the RAF is the same as the RTOB. I have added information to the cross section to show the abandoned channel.

Good cross section, extends from VW to VW.

T02.05-S1.05
An incision ratio of >3 on a reference B stream type is unlikely. Are you sure the feature you called the RAF was a feature the stream once had access to? You can have no RAF and then it is the same as the bankful elevation, resulting in a incision ratio of 1. Again, the bank height is not the same as the RAF, ever!
RAF and low bank height can be the same feature and often are in this watershed. Because this is a B stream type and there are only pockets of alluvium shown on the soils map, I have changed the RAF to bankful for this reach. Due to entrenchment of 1.4 the reach remains a "poor" in degradation.

What is the "other" for STD on degradation?
It won't let me have "none" with a poor rating. .

Head cut indicates active incision.
These are steep riffles.

T02.06 A

Is this a reference C or B?

C.

This came out as a 5 in Degradation because of the incision ratio, but the RAF is wrong. You will have to re-evaluate all of RAF and see if that impacts the Degradation scores.

This reach is incised and entrenched and it is located in alluvium. Perhaps this is one we can visit with George Springston.

Why is this a 5 for Aggradation with a P, G, G, R, R?

Same error with the little black boxes at the top of the form – I thought one put it into poor. The number is adjusted in the DMS.

Great cross section other than RAF not included!

It's been added.

T02.06 B

Great cross section other than RAF not included!

Added.

Why CEM stage of %? Does not appear to have widened and created a lower floodplain. Maybe stage 1 if truly incised?

It is in stage IV of F.

T2.07

Typo in cross section, TE should be TW. Done. Please fix this (and A to 0) and re-upload. The spread sheet is locked for editing.

Is the RAF a feature, just looks like a point on a slope?

It is a flat terrace.

T02.08

Channel slope of almost 4%, yet you have it as a sub-class slope of C?

Phase 1 error that was just caught.

Due to a lot of aggradation, I would say stage IV rather than III.

Yes.

T02.09

Dredging noted in Phase 1 data for this reach.

The only dredging I have confirmed, through an interview with Merrill Mundell, is on T08.04 just u/s of Williamsville.

More likely stage IV than III.

Yes.

Would this really be a C by reference or was Phase 1 wrong?
I re-calculated the slope using my GPS points and the slope is actually 3.1% though the valley type in Phase 1 is Broad, I found it to be Narrowly Confined, due to the presence of the town road. You and I changed the reference stream type to B.

Huge amount of incision noted. Is the RAF noted really an abandoned floodplain? Did the stream have access to the floodplain 13 feet above the current bed elevation?
The RAF has been changed to BKF.

T02.10
Is the TOB really the RAF or an abandoned glacial feature? Looks really high to be an RAF and for a stream with a high slope?
RAF changed to BKF.
Practically no erosion with lots of planform adjustment? Seems inconsistent?
Comments changed.

Incision seems really high for a reference B?
RAF changed to BKF.

T02.11
Dredging noted in Phase 1 data for this reach.
Maybe at the upstream end of the reach, above the second gorge where there is easy access, though I didn't see any evidence.

You noted gorges in the notes, how long are they? Should they be segmented out?
I had long discussions with Ty about segmenting this reach. The gorges are at the extreme downstream end and then again pretty high up so the entire reach is affected by them.

Shannon – when we reviewed this reach together, we decided it did not have an RAF and changed the degradation score and other related scores. The entrenchment on this reach is 1.2 so the degradation score must remain poor. I have changed the related data back to reflect this. Stream type departure had to be changed to "other" because the DMS will not allow a "poor" without a stream type departure.

T02.11-S1.01
Dredging noted in Phase 1 data for this reach.

T02.12
Dredging noted in Phase 1 data for this reach.
There is a lot of berming in this reach, but again, I didn't see anything like dredging.

You note stage V, is this reach stable with new floodplain? New bench not shown in the cross section. Just looks wide.

Changed to aggradation, planform and stage IV.

Incision Ratio is not reasonable.
We reviewed this one together and agreed it is incised.

T2.11-S1.01 A, B & C
Great notes! This is what we need for each reach so people get an idea of what is going on when they look at the data sheet. Is it possible you selected a low bankful?
Segments A & C are incised. Segment B is not and I would like to re-visit it in the spring.

Great cross section from VW to VW!

These segments have a slope of 6%, yet IR's of almost 3?

T2.03-S2.01
IR is not reasonable.
I have changed the RAF to BKF. It is difficult to tell on this one and I would like to bring George here. The road bed may have been elevated on the LB.

Great notes!
Thanks.

Widening should not be in poor with a P, R, P, G, R? Especially with practically no erosion?
Same error with the little black boxes at the top of the form – I thought one put it into poor. The number is adjusted in the DMS.

T02.03-S2.02
Cross section does not extend enough. Should not end at the RAF? Where is the valley wall? Is this reach really that incised?
Cross section goes from VW to VW. This issue is with the RAF.