Phase 2 Stream Geomorphic Assessment

Trout River Watershed
Towns of Berkshire, Enosburg, Richford, and Montgomery
Franklin County, Vermont

April 2007

Prepared for:
Missisquoi River Basin Association
2839 VT Route 105
East Berkshire, VT 05447

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April 27, 2007

Ms. Cynthia Scott
Missisquoi River Basin Association
2839 VT Route 105
East Berkshire, VT 05447

Re: Phase 2 Stream Geomorphic Assessment
Trout River Watershed
Franklin County, Vermont
JCO Project No. 3-1313-2

Dear Ms. Scott:

The Johnson Company is pleased to present the following Phase 2 Stream Geomorphic Assessment report to the Missisquoi River Basin Association (MRBA). This report includes the results of Phase 2 Geomorphic Assessments performed in accordance with the Vermont Agency of Natural Resources (VTANR) Stream Geomorphic Assessment Protocols on 20 reaches of the Trout River mainstem and its tributaries.

Should you have any questions or require additional assistance, please do not hesitate to contact me at (802) 229-4600. Thank you for the opportunity to be of assistance to the MRBA on this project.

Sincerely,

THE JOHNSON COMPANY, INC.

By:_____
Adam Robtoy
Project Scientist

C: Staci Pomeroy, VTANR

Reviewed by: SAS
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EXECUTIVE SUMMARY

The Johnson Company was retained by Missisquoi River Basin Association (MRBA) to perform Phase 2 Geomorphic Assessments on 20 reaches within the Trout River Watershed during the summer of 2006. In addition, Bridge and Culvert Assessments were conducted on all structures within the 20 reaches. All of the Phase 2 Assessments were conducted in accordance with the 2006 Vermont Agency of Natural Resources (VT ANR) Stream Geomorphic Assessment Protocols (VT ANR 2006) Steps 1-7. All of the collected data were recorded on the VT ANR Phase 2 data sheets and entered into the VT ANR Stream Geomorphic Assessment Web Based Data Management System (DMS). A thorough internal QA review was performed by The Johnson Company in December 2006. An independent QA review was performed by VT ANR in January 2007 and the Phase 1 and 2 DMS were updated on February 23 – 28, 2007. Goals and Objectives for the project included the following:

- Determine the existing stream type for each targeted reach and field verify the previously collected Phase 1 Assessments;
- Conduct geomorphic condition evaluations for each reach which detail the current condition and sensitivity to existing and future natural and anthropogenic stressors;
- Collect and interpret the Phase 2 data to assess which reaches are responding to anthropogenic and natural modifications, and help prioritize which reaches warrant further study and/or restoration activities;
- Identify potential restoration and or conservation projects within the study area to increase the sediment and nutrient retention potential within the watershed;
- Educate the public about the results of the study and the need for future work.

Individual narratives for each assessed reach are included in Section 4.2 and copies of the VT ANR Data Printouts are included in Appendix A. Based on the field measurements taken during the Phase 2 Assessments, it appears most of the assessed reaches in the watershed are in evolution stage II (degradation) or III (widening). A description of the different channel evolution stages can be found in the VT ANR Stream Geomorphic Assessment Protocols, which may be found online at: http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassess.htm. Historic dredging, channelization and human encroachments are the likely cause of the observed adjustments occurring in the watershed. Several reaches have undergone a stream type departure in response to these changes and no longer have access to their historic floodplain.

Of the 23 structures assessed within the watershed three were identified as being undersized and/or at risk of structural damage during future flood events. These structures are described in Section 4.4 below. Many of the other bridges were identified as localized channel and floodplain constrictions and may be contributing to the adjustment processes observed. During future bridge replacement projects the collected data should be used to ensure that the new bridges are correctly sized.

Based on the results of the Phase 2 Assessments and visual observations, potential restoration/corridor protection projects identified within the watershed are described below. Photos of some of the project areas are shown in Section 4.2.

- **Reach M02** – Priorities for this reach include addressing the major erosion occurring just downstream of Longley Bridge. Given the proximity of Route 118 and Longley Bridge Road some form of bank stabilization will be needed to protect these assets. In addition to the stabilization measures, buffer enhancement and some form of corridor protection and/or floodplain restoration should also be implemented at this site to increase the sediment and nutrient retention potential of the reach and prevent future landowner conflicts.
- **Reach M03** – The restoration/conservation technique for this reach involves protection of the river corridor in Segment B, which is the alluvial fan portion of the reach. This area is inherently unstable and will likely undergo significant planform adjustments during future flood events. Protecting the corridor from development will allow this segment to continue to function as a sediment and nutrient storage area and prevent future conflicts both within the reach and in upstream and downstream reaches.
- **Reach T3-01** – Two major problems were identified in T3-01. One is an eroding bank and failed rip-rap in the middle of the reach which is threatening a nearby mobile home. Given the current level of residential development in this area the only valid restoration technique appears to be re-stabilization of the eroding bank to prevent future structural damage. The other area of concern in T3-01 is the downstream end of the reach which is on an alluvial fan. Currently a mobile home is located in the floodplain and may be damaged during future flood events. In order to retain this important sediment and nutrient storage asset, the ideal project would involve moving the mobile home to restore the area to its natural depositional role. If this cannot be accomplished, then more traditional flood prevention measures may be required.
- **Reach T4-01** – Reach T4-01 is an incised reach which runs through agricultural land and suffers from a lack of floodplain access and adequate riparian buffers. The preferred restoration/conservation strategy for this reach is to protect the river corridor to allow the expected widening and aggradational processes to proceed as the channel re-establishes floodplain connection. It is expected that if the channel is allowed to evolve, over time, floodplain connection and a more natural meander pattern will be established which will enhance the sediment and nutrient retention potential of the reach and reduce excess erosion both in this reach and in upstream and downstream reaches. A key part of any corridor protection plan should include re-establishment of adequate woody buffers to filter out excess nutrients, stabilize streambanks, and improve wildlife habitat.
- **Reach T4-03** – Given the observed planform adjustments which have been documented in T4-03, and the expected future adjustments, a corridor protection plan should be established for reach T4-03. The plan would limit channel management and encroachments to allow for the expected widening, aggradation, and planform adjustments to occur as the channel evolves toward geomorphic equilibrium. A key part

of any corridor protection plan should include re-establishment of adequate woody buffers to filter out excess nutrients, stabilize streambanks, and improve wildlife habitat.

- **Reach T4-04** – As with T4-01 and T4-03, the main restoration/conservation strategy for T4-04 involves re-establishment of adequate woody buffers and protection of the river corridor to allow the expected adjustments to occur which, over time, will bring the channel back toward equilibrium and enhance the nutrient and sediment storage capacity and reduce excess erosion.
- **Reach M1S1-01** – The main problem associated with this reach is the lack of riparian buffer and cattle access to the stream channel in the middle of the reach. The restoration strategy for M1S1-01 would involve fencing schemes to limit the cows' access to the stream channel and planting riparian buffers to prevent excess sediment and nutrients from entering the stream channel.

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1.0 PROJECT OVERVIEW

The Johnson Company was retained by Missisquoi River Basin Association (MRBA) to perform Phase 2 Stream Geomorphic Assessments (SGAs) on 20 reaches of the Trout River mainstem and its associated tributaries during the summer of 2006 (Plates 1-3). Funding for the project was provided by the Vermont Agency of Natural Resources (VT ANR) Rivers Management Program. Assistants from MRBA aided The Johnson Company in the collection of field data, and notification of landowners within the study area. Quality Assurance responsibilities were coordinated between The Johnson Company and VT ANR. A Phase 1 SGA of the watershed was completed by Northwest Regional Planning Commission in 2004.

The Trout River watershed encompasses approximately 86 square miles within the towns of Berkshire, Enosburg, Richford, Montgomery, and Westfield and is a major tributary of the Missisquoi River. The study area included the entire mainstem of the Trout River from its confluence with the Missisquoi River to its head waters at the confluence of the South Branch and Jay Brook (reaches M01 through M05) in addition to one or more reaches on each of the seven major tributaries to the Trout River. The reaches were selected during a meeting between VT ANR, MRBA, and The Johnson Company in the spring of 2006.

Goals and Objectives for the project included the following:

- Determine the existing stream type for each targeted reach and field verify the previously collected Phase 1 Assessments;
- Conduct geomorphic condition evaluations for each reach which detail the current condition and sensitivity to existing and future natural and anthropogenic stressors;
- Collect and interpret the Phase 2 data to assess which reaches are responding to anthropogenic and natural modifications, and help prioritize which reaches warrant further study and/or restoration activities;
- Identify potential restoration and or conservation projects within the study area to increase the sediment and nutrient retention potential within the watershed;
- Educate the public about the results of the study and the need for future work.

2.0 BACKGROUND INFORMATION

2.1 GEOGRAPHIC SETTING

The Trout River watershed encompasses approximately 86 square miles within the towns of Berkshire, Enosburg, Richford, Montgomery, and Westfield and is a major tributary of the Missisquoi River which flows into Lake Champlain. The watershed elevation ranges from approximately 400 feet above mean sea level at the confluence with the Missisquoi to more than 3,000 feet at the upstream end of its tributaries. Plate 1 through 3 show the reaches which were studied as part of this assessment.

The watershed is and has historically been dominated by agricultural activities along the mainstem downstream of Montgomery Center and along most of the South Branch. The remainder of the watershed is dominated by forest land and residential properties. Residential development has grown substantially in the past few decades, though a majority of the land area is still sparsely populated by comparison to more urban areas.

2.2 GEOLOGIC SETTING

The Trout River watershed is located in the northernmost part of the Green Mountains. Like other areas within Vermont, the area has been periodically covered by glaciers, the most recent of which occurred from approximately 10,000 to 30,000 years ago. Bedrock in the study area is dominated by a combination of the Underhill and Hazen's Notch Formations which are comprised of various types of quartzite (Doll 1961). The surficial geology is comprised of predominantly glacial till above approximately 2,000 feet and kamen gravels and lake bottom sediments (Stewart and MacClintock 1970). Soils in the study area are dominated by silt loam, and loamy sands predominantly associated with the following series; Ondawa silt loam, Rumney silt loam, Winooski silt loam, Hadley silt loam, Podunk silt loam, and Colton loamy sand (USDA SCS 1979).

2.3 GEOMORPHIC SETTING

The locations of the assessed reaches are shown on Figures 1 and 2. The study area included the entire mainstem of the Trout River from its confluence with the Missisquoi River to

its head waters at the confluence of the South Branch and Jay Brook (reaches M01 through M05) in addition to one or more reaches on each of the seven major tributaries to the Trout River including Alder Brook, West Hill Brook, Black Falls Brook, South Branch, Jay Brook, and Wade Brook.

The channel slopes for the study area ranged from 0.5% to more than 4% within the watershed. Shallower slopes were observed on the Trout River mainstem and lower reaches of the major tributaries and generally ranged from 0.5% to 1.5%. Based on the field observations and review of topographic maps, portions of three of the reaches assessed are located on alluvial fans (M03B, T2-01A, and T3-01A). Bedrock grade controls were noted in several reaches throughout the study area including; M04, M05, T1-02, T2-01, T3-01, T3-02, T4-01, T4-02, T4-04, T5-01, T6-01, T7-01, and M2S3-02. The relatively frequent occurrence of these bedrock grade controls has served to mediate the impacts which have resulted from human caused disturbances by limiting potential upstream movement of bed degradation

Based on the Phase 1 data, the 20 reaches within the study have reference stream types of B and C which vary primarily due to valley and slope characteristics. The C-type streams included reaches M01, M02, M03, M05, T1-01, T4-01, T4-03, T4-04 and are characterized by wide valleys with slopes of less than 2% and substrate ranging from gravel to cobble. The remaining reaches are B type streams and have narrower valleys and steeper slopes.

2.4 HYDROLOGY

The nearest USGS gage for the study area is on the Missisquoi River near its confluence with the Trout River in East Berkshire. Based on the USGS data several flood events greater than 25 year discharge have occurred over the last 30 years including the years 1976, 1982, 1992, and 1997. The 1997 flood was one of the most destructive events in the area since the 1927 flood and caused severe damage to multiple homes, bridges and roads in the town of Montgomery.

2.5 ECOLOGICAL SETTING

The study area includes a variety of aquatic and upland habitat types which range from agricultural crop and pasture land to mixed hardwood and softwood forests. The majority of the aquatic habitat consists of riffle-pool and step-pool communities which have been affected by historic channel management and ongoing fluvial adjustment processes. Historically, as its name suggests, the Trout River was known for its fishing opportunities though in recent years the quality of the fishery has diminished due to loss of stable morphology, bank vegetation, and increased sedimentation and water temperatures (VT DEC, 2001). The majority of the riparian zone in the Trout River mainstem and South Branch consists of agricultural pasture and cropland intermixed with hardwood and softwood forests. Most of the other major tributaries are located in steeper valleys surrounded by mixed forest with sparsely distributed residential properties.

3.0 METHODOLOGY

3.1 FLUVIAL GEOMORPHIC ASSESSMENT PROTOCOLS

All of the Phase 2 SGAs were conducted in accordance with the 2006 Vermont Agency of Natural Resources (VT ANR) Stream Geomorphic Assessment Protocols (VT ANR 2006) Steps 1-7. All of the collected data were recorded on the VT ANR Phase 2 data sheets and entered into the VT ANR Stream Geomorphic Assessment Web Based Data Management System (DMS) and Feature Index Tool (FIT). Copies of the DMS Reports are provided in Appendix A. Following a thorough quality assurance (QA) review, the previously collected Phase 1 data were updated based on the findings of the Phase 2 Assessments. Bridge and Culvert Assessments were also conducted throughout the study area and the collected data were recorded on the appropriate VT ANR Bridge and Culvert Data Sheets and later entered into the VT ANR Bridge and Culvert Database.

In accordance with the protocols each reach was walked in its entirety prior to collecting any measurements to allow for reach segmentation where appropriate and identification of potential bankfull identifiers and cross section locations. A detailed Site Sketch Map was created for each reach documenting the locations of cross sections, photo points, pebble counts,

bank erosion and revetments, grade controls, debris jams, depositional features, channel cut-offs and avulsions, and other important features. Cross sections were measured at representative locations within each reach using a staff gauge and measuring tape.

3.2 QUALITY ASSURANCE AND QUALITY CONTROL

A thorough internal QA review was performed by The Johnson Company in December 2006. An independent QA review was performed by VT ANR in January 2007 and the Phase 1 and 2 DMS were updated on February 23 – 28, 2007. Appendix B contains the QA summary for the Trout River Project. No major quality assurance issues were identified during the QA process. Some of the stream types and geomorphic assessment scores were modified from what was originally assigned, though overall the collected data was found to be useable with no major restrictions or qualifications. All of the collected data is stored in the DMS and original copies of the data sheets may be found at The Johnson Company's office in Montpelier, VT.

4.0 RESULTS

The following section presents the results of the Phase 2 SGA data for the Trout River watershed. Section 4.1 summarizes the watershed scale stressors on the physical stability and habitat conditions of the project area. Section 4.2 summarizes the Phase 2 data, discusses the reach scale stressors, and for applicable areas, describes potential restoration and conservation projects. The Phase 2 SGA data are summarized in Appendix A.

4.1 WATERSHED SCALE STRESSORS

The watershed scale stressors for the Trout River have been broken down into two watershed zones, the Trout River mainstem and South Branch, and the upper watershed tributaries. These two zones have distinctly different characteristics and stressors so separating them will allow for a more logical discussion of the adjustment processes taking place.

4.1.1 Trout River Mainstem and South Branch

This watershed area is characterized by those reaches with a C reference stream type including nearly the entire mainstem of the Trout River and South Branch. The area is located within a relatively wide valley with shallow channel slopes. Land use in this region is dominated by agricultural land and rural residential development including the villages of Montgomery and Montgomery Center.

4.1.1.1 Hydrologic Regime

The Trout River is one of the few large river networks in Vermont that is not currently dammed. Remnants of old dams, which have long since been removed, were noted in reaches T4-02, and T5-01, however both were constructed in naturally occurring bedrock gorges and were only large enough to provide a localized hydraulic alteration. Urban land use is present in two areas within the watershed, the villages of Montgomery and Montgomery Center; however the affects of these developed areas on the hydraulic regime of the watershed are relatively minimal. Very few direct stormwater inputs were observed and despite the relative high population density both towns still have a large amount of pervious land area to allow for infiltration. The more direct effects of these villages are the degree of channelization and sediment alterations related to them, which are discussed in Section 4.2 below.

4.1.1.2 Sediment Regime

As stated above, most of this region of the watershed is dominated by agricultural lands, particularly hay and corn fields. Several areas of erosion were noted, especially along those fields with little or no riparian buffer. Multiple large point bars and steep riffles were observed, an indication of the active widening and aggradational processes occurring in these lower reaches. Channel avulsions and braiding were also observed, particularly immediately downstream of Montgomery Center in the alluvial fan portion of M03. This area is inherently unstable as flows from the steeper tributaries upstream are funneled through the channelized portion of M04 and finally have space to dissipate their energy and sediment in the broad valley. As a whole this portion of the watershed is dominated by aggradational processes which are a

result of historic degradation which has caused loss of floodplain access. The channel is currently widening and aggrading to re-create this lost floodplain access.

4.1.2 Upper Watershed Tributaries

This area is characterized by the upper reaches of most of the major tributaries of the Trout River including Alder Brook, West Hill Brook, Black Falls Brook, Wade Brook, and Jay Brook. All of these streams run through relatively narrow v-shaped valleys with steeper slopes and are generally characterized as A and B-type streams. These steep narrow valleys have for the most part prevented large scale development in this area. The surrounding riparian corridor is dominated by mixed hardwood and softwood forest. Sparse residential properties are scattered throughout along with a network of roads and bridges but these developments have not adversely affected the hydraulic or sediment regimes of the area. Several mass failures were noted in this area, as the streams meander through the narrow valley and bump against the valley wall. Several bedrock gorges and grade controls are also present. In general, this portion of the watershed was found to be consistent with its historic hydraulic and sediment transport regime.

4.2 REACH SCALE STRESSORS

Below is a summary of the dominant reach scale stressors observed throughout the watershed organized for each reach. Each summary contains a description of the physical adjustment processes observed, the boundary conditions, and any potential restoration and/or conservation projects identified. Reference is made to the stage of channel evolution for each reach.

The basic evolution model has five stages. In Stage I the stream is in equilibrium condition. In Stage II stream degradation is triggered by some stressor whereby the stream bed elevation is lowered and the stream no longer has adequate access to its floodplain. Without floodplain access, which dissipates the energy during high flow events, the stream banks erode and the channel widens (Stage III). The widened channel does not have the force to move all of the sediment through the system so sediment buildup and aggradation occur and a new

floodplain begins to form at a lower elevation (Stage IV). Once the new floodplain is fully developed the stream is back in equilibrium (Stage V). Further information regarding stream evolution models can be found at http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassess.htm.

4.2.1 Reach M01

Reach M01 extends from the confluence with the Missisquoi River to the confluence with Alder Brook, approximately 2.5 miles upstream. The riparian corridor is dominated by agricultural land with buffer widths ranging from 5 to 50 feet. The reach was found to be in regime with its naturally occurring stream type of C-gravel riffle-pool. The major adjustment processes were found to be historic degradation and active minor aggradation and widening which placed the stream in evolution stage III nearing stage IV. The habitat and geomorphic assessment scores were 0.68 and 0.7, both in the "good" range. The sensitivity rating for M01 was high, meaning there is a high likelihood that further adjustments will occur in the future. The reach had an incision ratio of 1.3 and does have access to its floodplain during high flow events. Historic dredging was noted during the Phase 1 SGA, though no evidence of active dredging was observed. Some minor bar scalping was observed in the middle of the reach. This historic dredging is likely the cause of the degradation which has occurred. The active widening and aggradation are a response by the stream to regain connection to its floodplain. Extensive channel management work was done in this reach within the last few years during replacement of the Route 118 bridge. This work involved planform adjustments, bank stabilization with rip-rap, and tree planting. Several large areas of rip-rap were also observed downstream of the bridge.

Given the current adjustment processes and boundary conditions, no large scale restoration projects have been identified within this reach. It is likely that the reach may continue to widen slightly in some areas, and the aggradational processes will continue to re-establish floodplain connection. Attempts should be made to limit channel management in these areas to allow the channel to move toward geomorphic equilibrium. There are a few areas along

the reach where buffers could be widened to improve wildlife habitat and increase resistance to erosion. As with all of the studied reaches, future human encroachments within the river corridor should be avoided to prevent potential flooding and erosion hazards.

Figure 1: M01 Cross Section.

4.2.2 Reach M02

Reach M02 is located on the Trout River mainstem from the confluence with Alder Brook to the confluence with Black Falls Brook. Similar to Reach M01, this reach is dominated by agricultural land with buffers ranging from 5 to 100 feet. The reach was found to be in regime with it reference stream type of C-gravel riffle-pool. The dominant adjustment factors were historic degradation and active widening, aggradation, and planform adjustments. The reach was found to be in evolution stage III with habitat and geomorphic scores of 0.66 and 0.59 respectively and a sensitivity rating of very high. The incision ratio of 1.4 suggests that the reach has degraded but still has access to some of its floodplain during flow events slightly greater than bankfull. Historic dredging was noted during the Phase 1 SGA, and likely was responsible for

the degradation observed. No active dredging was observed throughout the reach. Multiple large point bars and steep riffles were observed as evidence of the widening and aggradation currently ongoing in the reach. Two major problem areas were observed in M02, both being large areas of bank erosion near Longley Bridge Road (Figures 2-4).

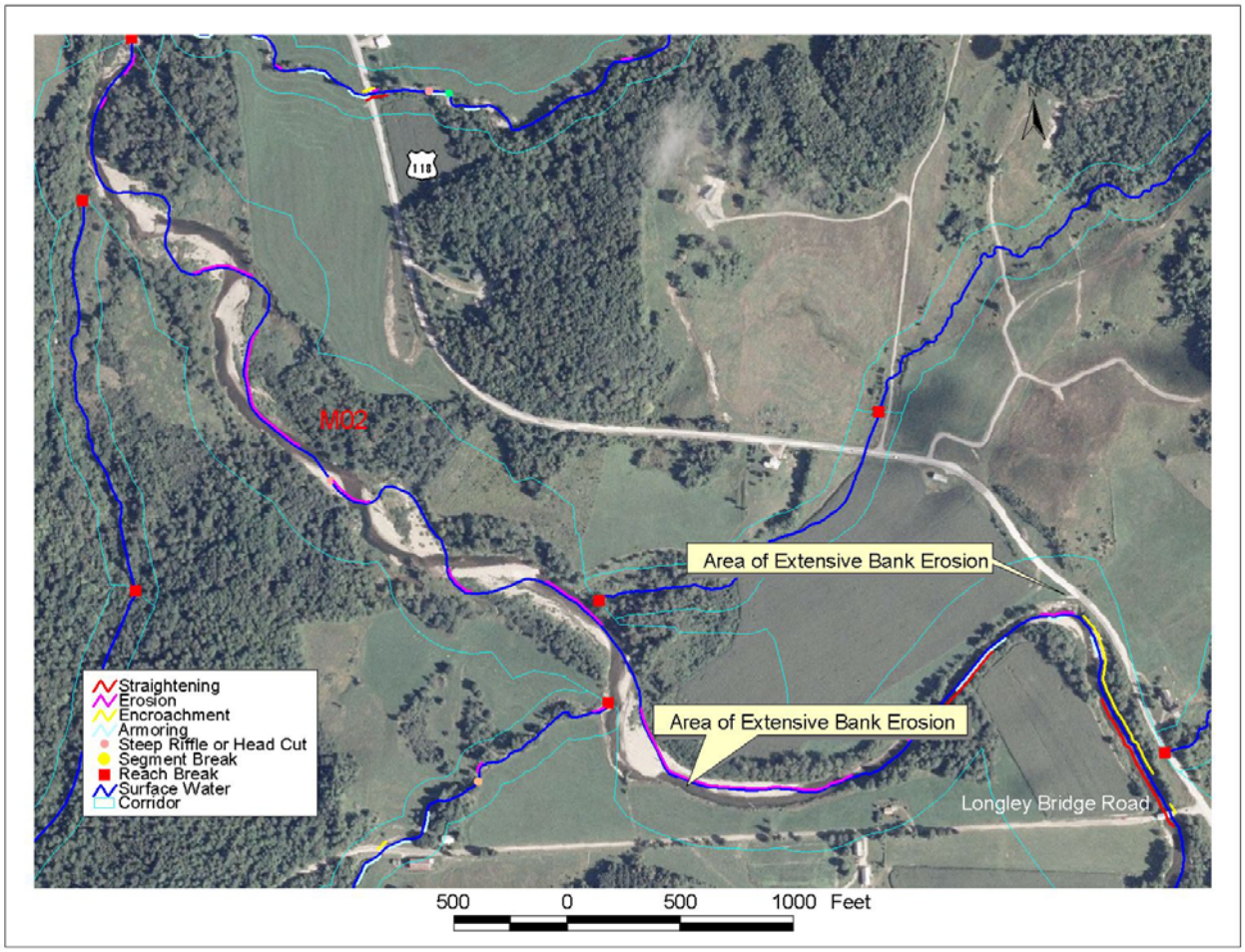

Figure 2: M02 Areas of Extensive Bank of Erosion

Figure 3: Bank Failure near Longley Bridge Road

Figure 4: Failed Rip Rap just Downstream of Longley Bridge.

The major restoration projects within M02 are centered on these areas of erosion shown in Figures 2 and 3 above. Both are relatively close to roads and will have to be stabilized sometime soon to protect the infrastructure. Given the widening, aggradation and planform adjustment processes currently ongoing within the reach, and the very high sensitivity to future adjustments, it would be important to incorporate some corridor protection in conjunction with the bank stabilization project to allow for areas where these anticipated adjustments could proceed without conflicting with human interests.

4.2.3 Reach M03

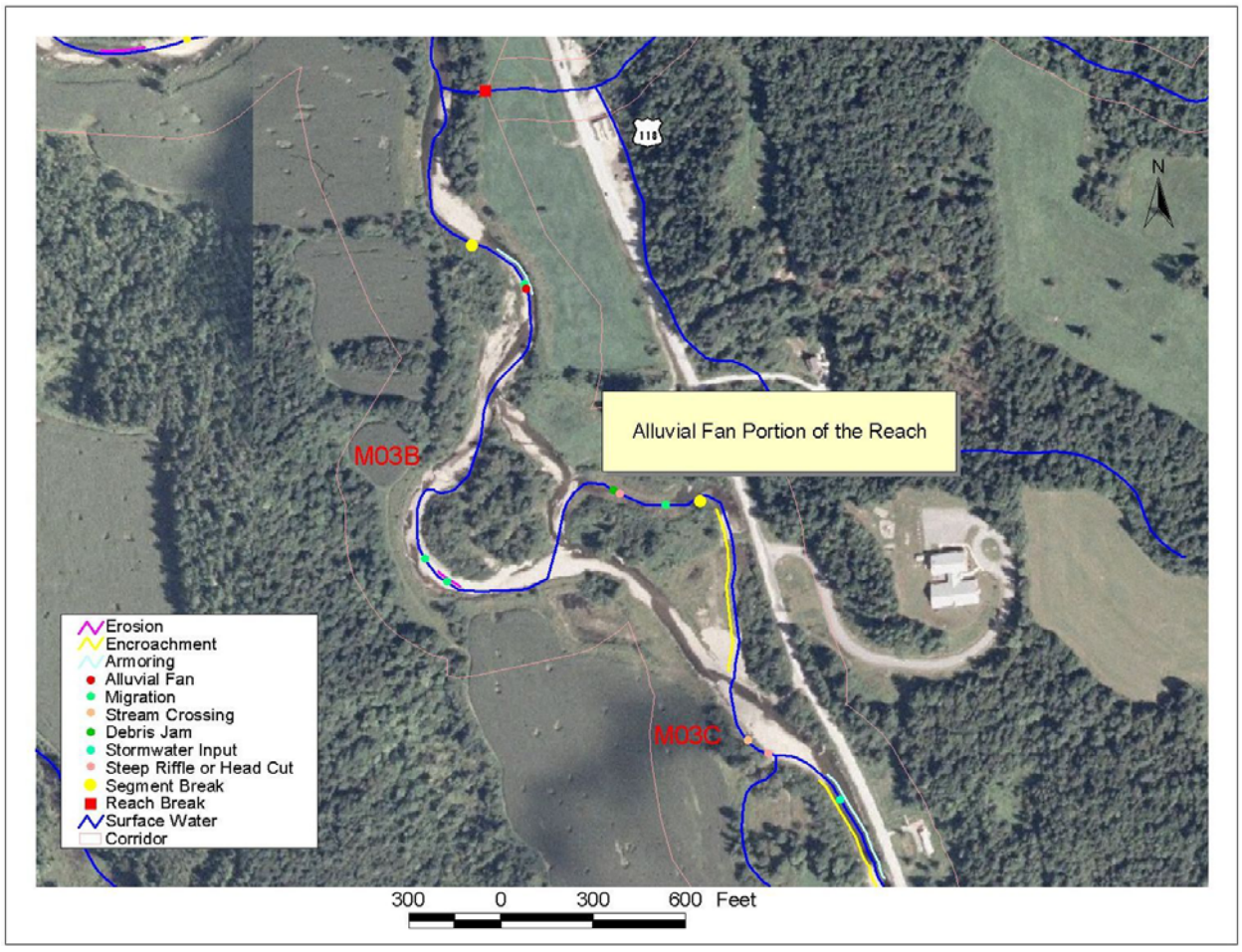

Figure 5: M03B and C

Reach M03 extends from the confluence with Black Falls Brook upstream to just north of Montgomery Center. The reach was segmented into three parts, M03A, M03B, and M03C. M03A and C were very similar and found to be in regime with their reference Phase 1 stream type of C-gravel, riffle-pool. Segment B is located in the southern portion of the reach and was found to be a braided D-type channel. The segment was characterized as an alluvial fan where the valley widens, and the river slows down as it comes out of the steeper valley above and drops out a great deal of sediment. This area is inherently unstable with an extreme sensitivity value, and saw a great deal of adjustments during the 1997 flood event. The Trout River Restoration Project was completed here by VT ANR in 2000, to restore some of the damage done during 1997. The work of the restoration project succeeded in moving this unstable section of stream away from the road and other vulnerable infrastructure to an area where it could naturally move around without causing further structural damage. All three segments were found to be in evolution stage III, with aggradation and widening to be the dominant adjustment processes. All three segments were found to be slightly incised, though they still have some access to their floodplain during high flow events. A few minor areas of erosion were noted throughout the reach, though most of the eroding banks have been rip-rapped. The riparian corridor was dominated by agricultural lands with sparse residential properties scattered along Route 118, which runs along the northern and eastern portions of the river corridor.

Figure 6: Alluvial Fan portion of Reach M03

The main restoration/conservation project associated with M03 is protection of the river corridor surrounding Segment B. This alluvial fan portion of the reach is inherently unstable and is an area where sediment deposits and channel migration are common during flood events so it is important to keep the river corridor free of potential human conflicts to allow for these expected adjustments to occur. Protecting this corridor may also prevent other conflicts further upstream and downstream by providing a release valve for adjustments to occur in Segment B which may prevent them from happening elsewhere.

4.2.4 Reach M04

Reach M04 extends from the upstream end of M03 to the confluence with Hannah Clark Brook. A majority of the reach runs through the village of Montgomery Center. The upstream end of the reach is dominated by a large bedrock gorge located at the confluence with Hannah Clark Brook. M04 was found to be an F-cobble stream which is a stream type departure from its reference B-type. The stream type departure is mainly caused by extensive channelization and degradation throughout Montgomery Center, which has caused the stream to lose access to its

floodplain. A majority of both banks of the reach are covered in rip-rap or gabion baskets to provide bank stability. The stream was found to be in evolution stage II, due to the historic degradation. The habitat and geomorphic assessment scores were 0.58 and 0.61 respectively, both in the "fair" category and the reach had a sensitivity rating of very high. The riparian corridor was dominated by residential property on both banks with forest and hay fields being the sub-dominant land use. Two flood chutes were noted on the right bank just downstream of the village where the rip-rap ends, which is expected as this is the first place in the reach where high flows can leave the channel.

Figure 7: Reach M04 in the village of Montgomery Center

Due to the extensive channel management and residential encroachment in this reach no restoration projects have been identified. In order to protect the human infrastructure here, the reach will have to continue to be managed in it current state. If possible, efforts should be made to limit further development within the river corridor to prevent damage when the next large scale flood event occurs. Implementing the corridor protection in M03B discussed above is also important to this reach as any encroachments or attempts to limit channel management downstream may instigate channel adjustments upstream in M04.

4.2.5 Reach M05

M05 extends from the bedrock grade control located near the confluence with Hannah Clark Brook to the confluence of Wade Brook and Jay Brook approximately 1 mile upstream. The reach was found to be in regime with its reference Phase 1 stream type (Cb-cobble) with a slope of 2.7%. The major adjustment processes were historic degradation and minor widening. Dredging was documented throughout the reach after the 1997 flood in the Phase 1 Assessment, however, no active dredging was observed during the Phase 2 Assessment. It is likely that this historic dredging initiated the degradation which accounted for the incision ratio of 1.4. Though moderately incised, the reach still has some access to its historic floodplain during high flow events. Several bedrock grade controls were noted throughout the reach, and were important in preventing upstream migration of any headcuts initiated during the historic dredging. The measured channel width of 60 feet was slightly wider than the reference width of 49 feet indicating that the channel is widening in response to the partial loss of floodplain connection. Despite the widening channel only minor areas of erosion were noted. The habitat and geomorphic assessment scores were 0.81 and 0.84, in the "good" range and close to reference conditions. The sensitivity rating for M05 was moderate, meaning that it is less likely to undergo further adjustments than the other mainstem reaches. The riparian corridor was dominated by forest land with virtually no human encroachments observed. No restoration projects were identified in this reach as no major problem areas were noted. The reach appears to be relatively stable and there are no human encroachments which threaten its ability to adjust to future changes.

4.2.6 Reach T1-01

Reach T1-01 is the downstream end of Alder Brook, the first major tributary of the Trout River. This reach extends from the confluence with the Trout just upstream of Hopkins Bridge Road to approximately 1 mile upstream where the valley narrows and the stream channel steepens. The reach was found to be in regime with its Phase 1 reference type (C-gravel, riffle pool) and the dominant adjustment processes were minor aggradation and widening, placing the stream in evolution stage III with a high sensitivity rating. The habitat and geomorphic scores

were 0.7 and 0.72 respectively, both in the "good" range. With an incision ratio of 1.2, the stream still has access to most of its historic floodplain. Some minor planform adjustments in the form of enlarged bars and a future potential neck cut-off were observed at the downstream end of the reach near the confluence with the Trout River. The riparian corridor was dominated by hay and pasture on the right and forest on the left. Buffer widths ranged from 5 feet to >100 feet. Overall the reach appeared relatively stable with no major problem areas noted. No large scale restoration and/or conservation projects were identified for this reach.

Figure 8: Cross Section location T1-01

4.2.7 Reach T1-02

Reach T1-02 is located from the end of T1-01 to just north of the culvert located on Wightman Hill Road, approximately 1.5 miles upstream. The reach was found to be in regime with its Phase 1 reference stream type (B-cobble). The habitat and geomorphic scores were 0.85 and 0.90 respectively, both in the "reference" range and the reach was found to be in evolution stage I with a low sensitivity rating. No major adjustment processes were noted and the reach appeared to be relatively stable. Several bedrock grade controls and waterfalls were located

throughout the reach. The riparian corridor was almost completely forested with the exception of immediately adjacent to the culvert along Wightman Hill Road. No restoration or conservation projects have been identified in this reach.

4.2.8 Reach T2-01

Reach T2-01 (West Hill Brook) extends from its confluence with the Trout to the large bedrock gorge located approximately ½ mile upstream. The reach was segmented in T2-01A and T2-01B. T2-01A is the lower ½ of the reach downstream of the Route 118 bridge and is located on an alluvial fan. The segment was found to be in regime with its Phase 1 reference stream type (C-gravel). The habitat and geomorphic scores were 0.54 (fair) and 0.73 (good) respectively. As expected with an alluvial fan, the dominant adjustment processes were aggradation and widening with lots of large gravel bars observed and the reach was found to be in evolution stage III. The reach had a very high sensitivity rating, meaning that is will likely continue to undergo further aggradation and widening in the future. Historic dredging was noted during the Phase 1 Assessment, though no active dredging was observed. The incision ratio of 1.3 suggests that historic degradation had occurred, though the channel is actively aggrading and does have access to most of its historic floodplain. No major areas of erosion were noted. The riparian corridor was dominated by corn and hay fields intermixed with small patches of forest with buffer widths averaging 5 to 50 feet. The bridge which separates the two segments was heavily clogged with gravel. See Section 4.3 for recommendations.

T2-01B is the upper ½ of the reach and was found to be a B-gravel stream due to its steeper slope and narrower valley. The upper 300 feet of the segment was dominated by a large bedrock gorge which was excluded from the assessment. The habitat and geomorphic scores were 0.77 and 0.79, both in the "good" range. Historic degradation was found to be the dominant adjustment process, and with an incision ratio of 1.9. The reach has lost access to most of its historic floodplain and is in evolution stage II. A large portion of both banks was stabilized with rip-rap and gabion baskets, and the riparian corridor was dominated by residential development. Given the large amount of development, no restoration and/or conservation

projects were identified for this reach. Segment A is an alluvial fan, which is inherently unstable, so efforts should be made to prevent any future development on this portion of the reach.

Figure 9: large gravel bar in T2-01A

4.2.9 Reach T3-01

Reach T3-01 is the most downstream reach of Black Falls Brook and extends from its confluence with the Trout River upstream to the bridge on Black Falls Road. The reach was segmented into T3-01A and T3-01B due to differences in channel dimensions and reference stream types. T3-01A is the downstream end of the reach and was found to be an alluvial fan. The segment was in regime with its Phase 1 reference stream type (C-gravel) and in evolution stage III. Dominant adjustment processes were active aggradation, widening and planform adjustments and historic degradation. The habitat and geomorphic scores were 0.64 and 0.61, both fair conditions. Being an alluvial fan, the reach had a very high sensitivity rating. The incision ratio of 1.5 suggests that the stream still has some access to its historic floodplain during high flow events. Historic dredging was noted during the Phase 1 Assessment, though no active dredging was observed during the Phase 2 Assessment. The riparian corridor was dominated by corn and hay fields with some residential development on the left bank. Multiple floodchutes

and a channel avulsion were present showing the amount of historic adjustment the segment has undergone. The main problem area associated with this segment is the mobile home located within the floodplain in the lower part of the segment. The home was heavily damaged during the 1997 flood, and a newer structure was put in the same spot after the flood. Given the inherent instability of this segment, and the location of the current mobile home, it is likely that the structure will be further damaged during the next flood event if no action is taken. The most appropriate action for this area would be to move the mobile home out of the floodplain. Dredging or berming the stream would not be valid techniques here as they would simply transmit the instability of the area to upstream or downstream portions of the river.

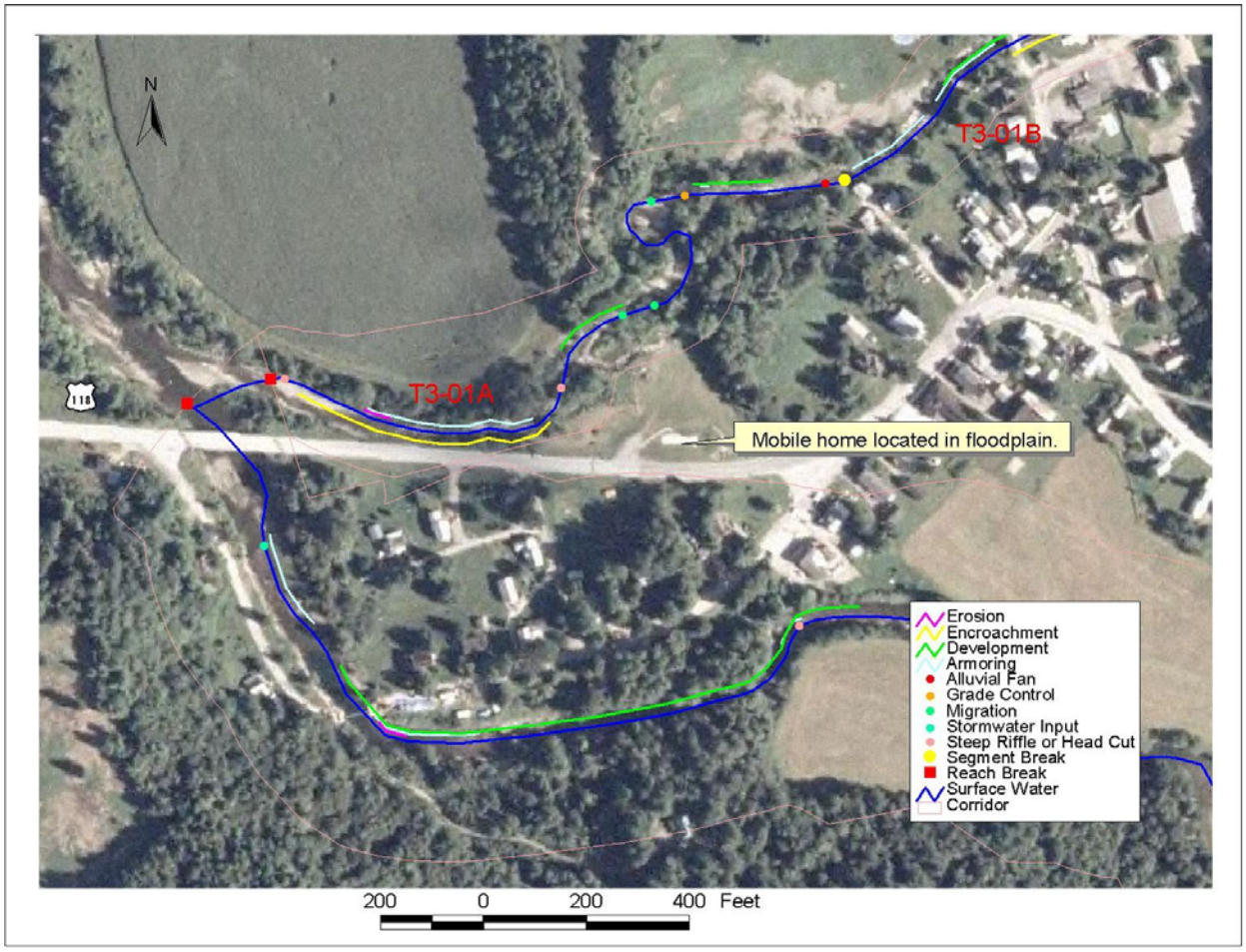

Figure 10: T3-01A and B

Figure 11: Mobile Home in Floodplain T3-01A

T3-01B extends from a few hundred feet below Fuller Bridge upstream to Black Falls Road bridge and runs through Montgomery Village. The segment was found to be in regime with its reference stream type (B-cobble) and in evolution stage II with a moderate sensitivity rating. The dominant adjustment process was historic degradation. The habitat and geomorphic scores were 0.73 and 0.80 respectively, both in the good range. A majority of both banks were covered with rip-rap or other revetments. The riparian corridor was dominated by residential development with hay fields along the left bank near the upstream end of the segment. Given the extensive channelization and residential encroachment, no restoration projects were identified in this segment. One area of failed rip-rap and bank erosion was noted mid-segment which may soon threaten the mobile home located near it. In order to prevent structural damage, the streambank will have to be stabilized, or the structure will have to be moved.

Figure 12: Failed Rip-Rap along T3-01B

4.2.10 Reach T3-02

Reach T3-02 extends from the Black Falls Road bridge at the end of T3-01 upstream approximately 1 mile to a large bedrock waterfall. The reach was found to be in regime with its Phase 1 reference stream type (B-cobble). The stream was determined to be in reference condition with habitat and geomorphic scores of 0.86 and a moderate sensitivity rating. No major adjustment processes were noted. One large mass failure was noted in the lower portion of the segment where the stream has bumped against the valley wall. The riparian corridor was dominated by forest and several bedrock waterfalls and grade controls were observed. Overall the reach appeared relatively stable, and no restoration and/or conservation projects were identified.

4.2.11 Reach T4-01

Reach T4-01 is the most downstream reach of the South Branch tributary. It extends from its confluence with the Trout River in Montgomery Center upstream to Hutchins Bridge Road. The upper portion of the reach was not included in the assessment as it was dominated by a large bedrock gorge. The reach was in regime with its Phase 1 reference stream type (C-gravel) though historic degradation has placed the stream in evolution stage II with a high

sensitivity rating. Historic dredging and possible straightening were noted during the Phase 1 Assessment which likely is responsible for the relatively high incision ratio of 1.8 measured during the Phase 2 Assessment. No active dredging or channelization was observed during the Phase 2 Assessment. The dominant adjustment process was the historic degradation, with minor active widening. The riparian corridor was dominated by agricultural activities, namely hay fields and pasture with relatively narrow buffers between 5 and 25 feet. A significant amount of rip-rap was present on both banks, and consequently relatively minor amounts of bank erosion were observed.

The major restoration opportunity associated with this reach is protection of the river corridor and establishment of adequate buffers. Given the historic stressors and current evolution stage it is likely that the reach will undergo significant adjustment processes to re-establish floodplain connection and a more natural meander pattern. Protecting the river corridor will allow for these adjustment processes to take place without human related conflicts and allow the stream to move toward geomorphic equilibrium. Alternatively, a more active floodplain restoration effort could be used to re-establish floodplain connection by lowering the adjacent streambanks with heavy equipment. Enhancing the current woody buffer would improve wildlife habitat and help prevent excess erosion.

Figure 13: Cross Section T4-01 Showing High Incision

4.2.12 Reach T4-02

Reach T4-02 extends from Hutchins Road bridge upstream for approximately 1 mile to where the valley widens. The reach was in regime with its Phase 1 reference stream type (B-cobble) and found to be in reference condition or evolution stage I. The habitat and geomorphic scores were 0.89 and 0.86 respectively. No major adjustment processes were observed and overall the reach appeared to be stable giving it a moderate sensitivity rating. Historic dredging was noted in the Phase 1 Assessment but no active dredging was observed. The riparian corridor was dominated by forest with a few small hay fields mixed in. Overall, relatively wide riparian buffers were present averaging 50 to 100 feet. Five separate bedrock grade controls and/or waterfalls were noted throughout the reach. No restoration/conservation projects were identified within the reach.

4.2.13 Reach T4-03

Reach T4-03 extends from the end of T4-02 upstream for approximately ¾ mile to the Sundell Road Bridge. The reach was in regime with its Phase 1 reference stream type (C-gravel riffle pool) though major aggradation, widening, and planform adjustments were observed. The

habitat and geomorphic scores were 0.58 and 0.64, both in the "fair" range, and the reach was found to be in evolution stage III. Historic degradation has increased the incision ratio to 1.3, though the channel still has access to most of its historic floodplain during high flow events. Significant planform adjustments were observed between the Phase 1 river center line and the current meander centerline. Bar scalping was observed on a few of the large point bars in the middle of the reach. The riparian corridor was dominated by hay and corn fields with relatively narrow buffers ranging from 0 to 25 feet.

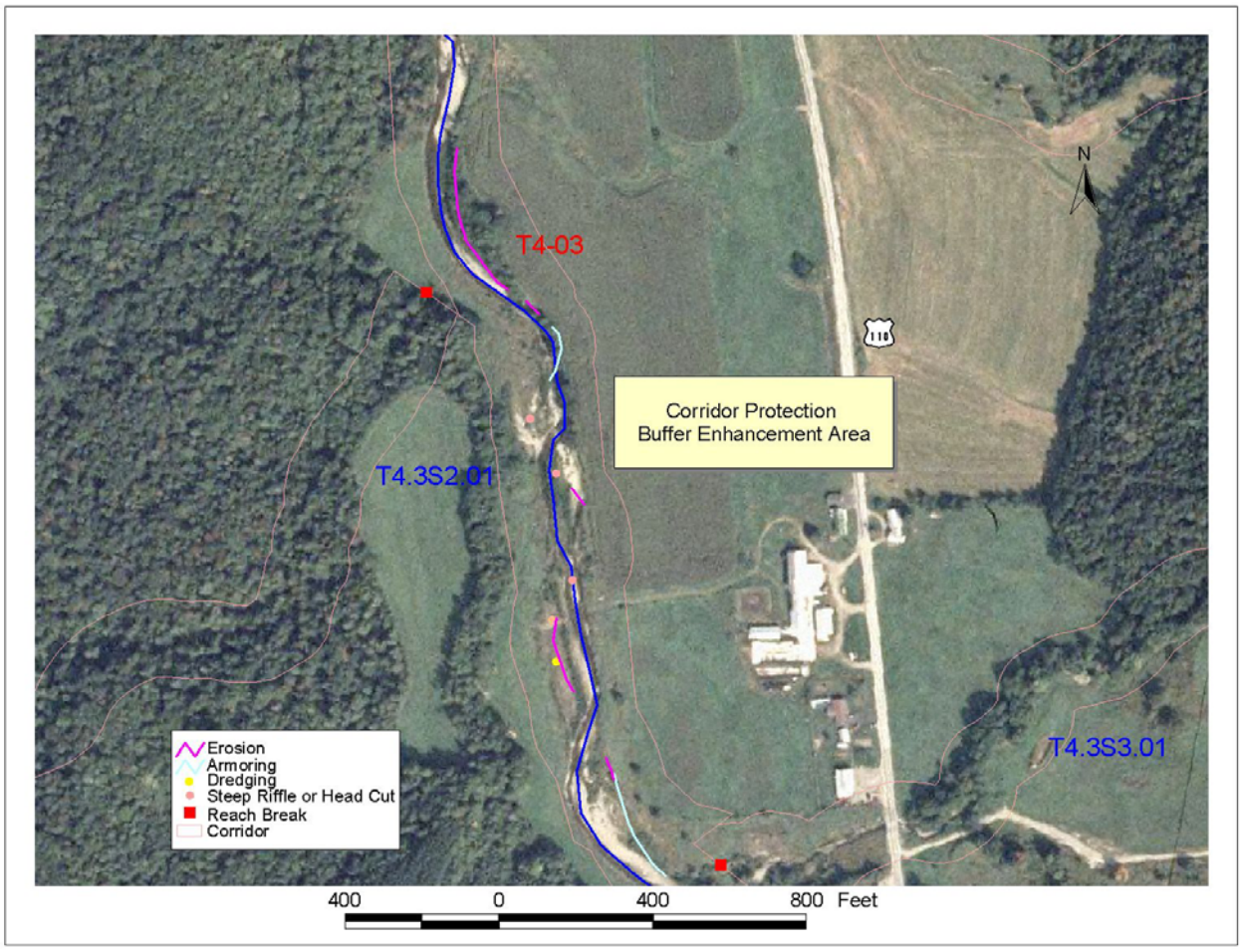

Figure 14: T4-03

Given the current adjustment processes observed, and the very high sensitivity rating, the most appropriate restoration/conservation projects for this reach are corridor protection and buffer enhancement. These techniques would allow the expected channel adjustments to occur

and the channel to reach geomorphic equilibrium while increasing the sediment and nutrient retention potential and improving wildlife habitat.

Figure 15: Bank failure and debris along T4-03

4.2.14 Reach T4-04

Reach T4-04 is located from just downstream of Sundell Road upstream for approximately 1 mile to the confluence with Pacific Brook. The stream type was found to be C-gravel riffle pool, which is consistent with the Phase 1 reference type. The habitat and geomorphic scores were 0.66 and 0.78, both in the "good" category, and the reach was found to be in evolution stage II. The dominant adjustment processes were minor historic degradation, and minor active aggradation. The incision ratio of 1.2 suggests that the stream has degraded, but still has some level of floodplain access. The riparian corridor was dominated by hay and corn fields on the right and forest on the left with buffers ranging from 5 to 100 feet. Based on visual observations it appears that the channel may have been straightened in the past, and bar scalping was observed near the bridge located on South Branch Road.

The main restoration project associated with this reach involves re-establishment of adequate buffers between the hay and corn fields along the right bank and the stream channel and protection of the river corridor to allow for the expected channel adjustments to occur.

4.2.15 Reach T5-01

Reach T5-01 (Hannah Clark Brook) extends from its confluence with the Trout just upstream of Montgomery Center to the first major tributary located near the Route 242 crossing. The habitat and geomorphic scores were 0.87 and 0.85 respectively. The stream was found to be in reference condition, with no major adjustment processes occurring and had a low sensitivity rating. The A cobble step pool stream type was consistent with the Phase 1 reference stream type. The riparian corridor was dominated by forest land with a few hay fields mixed in and buffers ranging from 50 to 100 feet. No major areas of erosion were noted. Remnants of a concrete dam were observed in the middle of the reach. The dam is no longer in place, but portions of the left abutment built into the existing bedrock were still visible. The dam no longer holds back any water and the channel width in this location is not significantly wider than it would be without the abutment. Several large bedrock grade controls and waterfalls were noted throughout the reach. No restoration and/or conservation projects were identified here.

4.2.16 Reach T6-01

Reach T6-01 (Jay Brook) extends from its confluence with Wade Brook in Montgomery upstream for approximately ½ mile to the first major tributary confluence. The B-cobble step pool stream type was consistent with its Phase 1 reference type. The stream was found to be in evolution stage III with historic degradation and minor active widening to be the dominant adjustment processes. Despite these adjustment processes the stream had a moderate sensitivity rating as B-cobble streams are more resistant to change than other stream types. Historic dredging was noted during the Phase 1 Assessment, though no active dredging was observed during the Phase 2 Assessment. The habitat and geomorphic scores were 0.83 and 0.79, both in the "good" range. The riparian corridor was dominated by forest with no observed human related encroachments. No major areas of bank erosion were noted with the exception of a few small bank failures in the lower portion of the reach. Overall, the reach appeared stable and no restoration/conservation projects were identified.

4.2.17 Reach T7-01

Reach T7-01 (Wade Brook) extends from the confluence with Jay Brook upstream for approximately 2 miles to the Amadon Road Bridge. The stream was found to be in reference condition with no major adjustment processes observed. The B-cobble step pool stream type was consistent with the Phase 1 reference type. The riparian corridor was dominated by forests on both sides with no human related encroachments observed. Multiple bedrock grade controls were noted throughout the reach. No major areas of erosion were noted with the exception of four mass failures located where the channel has bumped against the valley wall. Overall, the reach appeared relatively stable and no restoration/conservation projects were identified.

Figure 16: Cross Section Location Reach T7-01

4.2.18 Reach M1S1.01

Reach M1S1.01 is the first small unnamed tributary of the Trout located approximately 1 mile upstream of its confluence with the Missisquoi River. The reach extends from its confluence with the Trout upstream to where the valley narrows approximately ¾ mile upstream. The B-cobble step pool stream type was consistent with the Phase 1 reference stream type. The major adjustment factor was found to be historic degradation which has increased the incision ratio to 2.0. The habitat and geomorphic scores were 0.52 and 0.59 both in the "fair" range and the reach had a very high sensitivity rating. Active widening was observed in the downstream

end of the reach below the culvert crossing Route 118. The riparian corridor was dominated by pasture and hay fields and the middle of the reach runs through a barn yard where cows have access to the stream channel. Narrow buffers of 0 to 25 feet were observed throughout, except downstream of the Route 118 culvert where willow trees have been planted by Missisquoi River Basin Association providing adequate buffer space. The major restoration/conservation project associated with this reach is to exclude the cattle from the stream channel within the barnyard and increase the buffer widths throughout the reach.

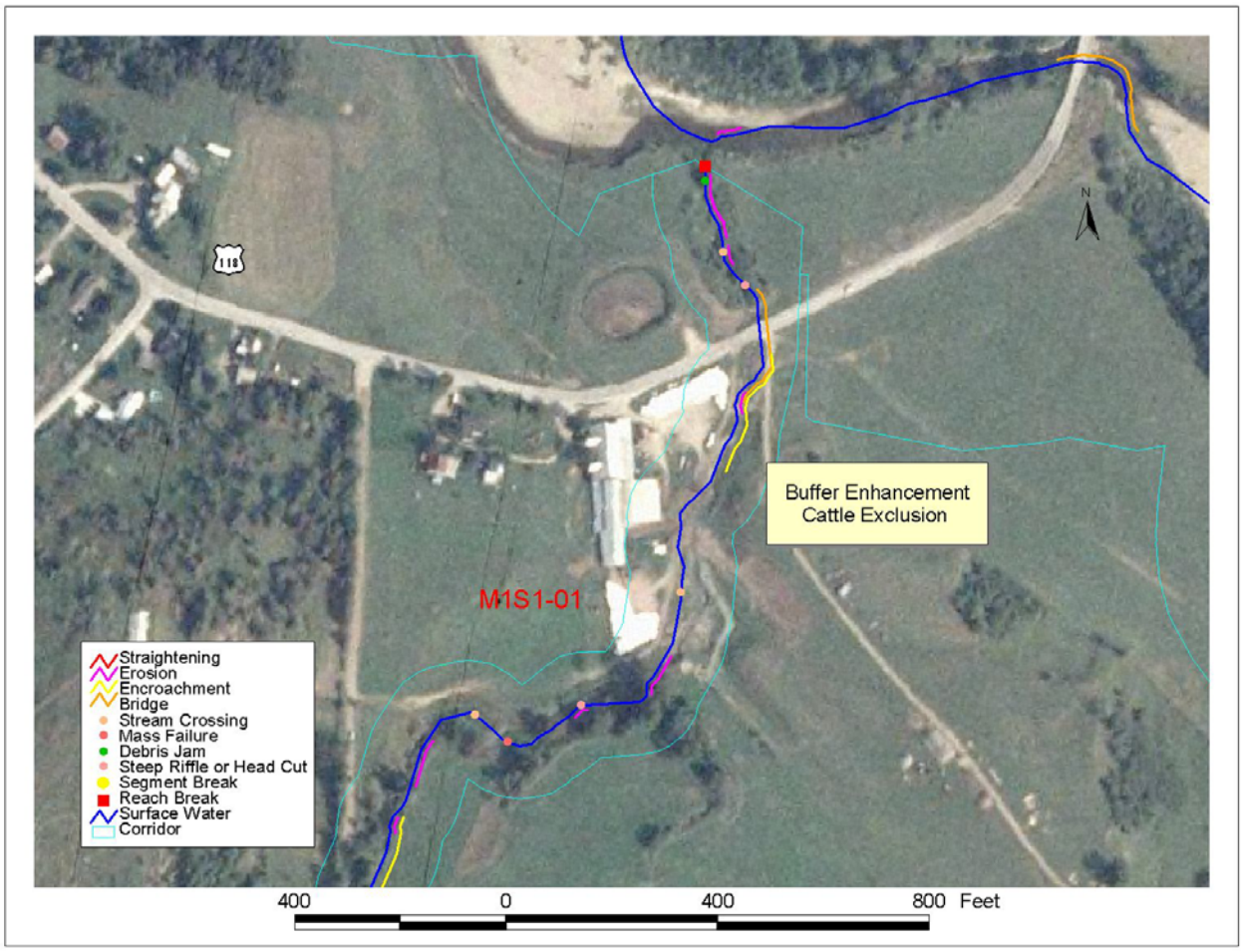

Figure 17: M1S1.01

Figure 18: Barnyard located in M1S1.01

4.2.19 Reach M2S3.01

Reach M2S3.01 extends from its confluence with the Trout upstream for approximately ¼ mile to just beyond the arch crossing on Longley Bridge Road. The stream was found to be in regime with it Phase 1 reference stream type (B-cobble) and in evolution stage II. The habitat and geomorphic scores were 0.65 and 0.79 in the "good" range. The dominant adjustment process was historic degradation which has raised the incision ratio to 1.6. The stream has lost access to some of its historic floodplain except during high flow events larger than bankfull. The riparian corridor was dominated by pasture and hay fields with woody buffers averaging approximately 25 feet. No major areas of erosion were noted within the reach. Overall the reach appeared relatively stable, despite the historic degradation. No restoration/conservation projects were identified in this reach.

4.2.20 Reach M2S3.02

Reach M2S3.02 extends from just above the arch on Longley Bridge Road upstream for approximately 1.5 miles to the headwaters of the stream. The stream was found to be in regime with it Phase 1 reference stream type (B-cobble) and in evolution stage III. The habitat and geomorphic scores were 0.80, "good". The dominant adjustment processes were found to be historic degradation and minor active widening and planform adjustments. Several mass failures

were noted where the stream has bumped against the relatively narrow valley walls. Several large debris jams were also noted near these locations and are contributing to the channel planform adjustments. Several large bedrock grade controls and waterfalls were observed throughout the reach. The riparian corridor was dominated by forest land with virtually no human related encroachments observed. No restoration/conservation projects were identified within the reach.

4.3 BRIDGE AND CULVERT ASSESSMENTS

A total of 23 Bridge and Culvert Assessments were completed within the study area. Summary reports from the VT ANR DMS are included in Appendix A. Of the 23 assessed structures, three were identified as being undersized and/or at risk of damage during future flood events. The three structures were located in reaches T1-01, T2-01, and T4-04. The structure in T1-01 is located on Route 118 just south of Hutchins Bridge Road. The structure is undersized and was found to be partially clogged with sediment. Similar problems were noted with the Route 118 Bridge located in T2-01 between West Hill and Hill West Roads. Both of these structures could be damaged during future flood events as the excess gravel may cause erosion around and/or under the abutments. The third structure located in T4-04 on South Branch Road was found to be slightly undersized and it appeared that the right abutment had been recently repaired. This is a private structure and significant manipulation of nearby gravel bars was observed upstream and downstream of the structure. Gravel was used to berm along the stream channel above and below the structure to prevent flooding and damage to the abutments. Pictures of the three bridges are shown below.

Figure 19: T1-01 Bridge

Figure 20: T2-01 Bridge Clogged with Sediment

Figure 21: T4-04 Bridge – South Branch Road

4.4 POTENTIAL PROJECT AREAS

Based on the results of the Phase 2 Assessments and visual observations, potential restoration/conservation projects identified within the watershed are described below. Each of the project areas is also discussed in the individual reach narratives in Section 4.2 along with photos and location maps. The projects identified are intended to reduce sediment and nutrient inputs into the watershed while allowing the stream to move toward geomorphic equilibrium conditions and reduce conflicts between neighboring landowners and the stream. It is important to note that many of these strategies are not short term fixes but long term solutions whose benefit may not be seen for some time. Historic techniques such as bank armoring, dredging and channelization may seem effective in the short term, but almost always fail during future flood events, and usually transmit channel instability upstream and downstream to other areas of the watershed. While these techniques may be required to protect infrastructure, it is important to also focus on larger scale restoration/conservation sites that will be beneficial to the watershed as a whole and reduce the future need for channel management activities.

- **Reach M02** – Priorities for this reach include addressing the major erosion occurring just downstream of Longley Bridge. Given the proximity of Route 118 and Longley Bridge Road some form of bank stabilization will be needed to protect these assets. In addition to the stabilization measures, buffer enhancement and some form of corridor protection and/or floodplain restoration should also be implemented at this site to increase the sediment and nutrient retention potential of the reach and prevent future landowner conflicts.
- **Reach M03** – The restoration/conservation technique for this reach involves protection of the river corridor in Segment B, which is the alluvial fan portion of the reach. This area is inherently unstable and will likely undergo significant planform adjustments during future flood events. Protecting the corridor from development will allow this segment to continue to function as a sediment and nutrient storage area and prevent future conflicts both within the reach and in upstream and downstream reaches.
- **Reach T3-01** – Two major problems were identified in T3-01. One is an eroding bank and failed rip-rap in the middle of the reach which is threatening a nearby mobile home. Given the current level of residential development in this area the only valid restoration technique appears to be re-stabilization of the eroding bank to prevent future structural damage. The other area of concern in T3-01 is the downstream end of the reach which is on an alluvial fan. Currently a mobile home is located in the floodplain and may be damaged during future flood events. In order to retain this important sediment and nutrient storage asset, the ideal project would involve moving the mobile home to restore the area to its natural depositional role. If this cannot be accomplished, then more traditional flood prevention measures may be required.
- **Reach T4-01** – Reach T4-01 is an incised reach which runs through agricultural land and suffers from a lack of floodplain access and adequate riparian buffers. The preferred restoration/conservation strategy for this reach is to protect the river corridor to allow the expected widening and aggradational processes to proceed as the channel re-establishes floodplain connection. It is expected that, over time, if the channel is allowed to evolve, floodplain connection and a more natural meander pattern will be established which will enhance the sediment and nutrient retention potential of the reach and reduce excess erosion both in this reach and in upstream and downstream reaches. A key part of any corridor protection plan should include re-establishment of adequate woody buffers to filter out excess nutrients, stabilize streambanks, and improve wildlife habitat.
- **Reach T4-03** – Given the observed planform adjustments which have been documented in T4-03, and the expected future adjustments, a corridor protection plan should be established for reach T4-03. The plan would limit channel management and encroachments to allow for the expected widening, aggradation, and planform adjustments to occur as the channel evolves toward geomorphic equilibrium. A key part of any corridor protection plan should include re-establishment of adequate woody buffers to filter out excess nutrients, stabilize streambanks, and improve wildlife habitat.
- **Reach T4-04** – As with T4-01 and T4-03, the main restoration/conservation strategy for T4-04 involves re-establishment of adequate woody buffers and protection of the river corridor to allow the expected adjustments to occur which, over time, will bring the

channel back toward equilibrium and enhance the nutrient and sediment storage capacity and reduce excess erosion.

- **Reach M1S1-01** – The main problem associated with this reach is the lack of riparian buffer and cattle access to the stream channel in the middle of the reach. The restoration strategy for M1S1-01 would involve fencing schemes to limit the cows' access to the stream channel and planting riparian buffers to prevent excess sediment and nutrients from entering the stream channel.

5.0 REFERENCES

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Vermont Agency of Natural Resources, Vermont Stream Geomorphic Assessment Phase 2 Handbook and Appendices, 2006.

APPENDIX A

PHASE 2 DATA MANAGEMENT SYSTEM REPORTS

Project: **Trout River Mouth**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **13,591**

Phase 2 Segment Summary

Reach # **M01** Segment: **0**
Observers: **Adam Robtoy, Noelia**
Segment Location: **from confluence with Missisquoi to confluence with Alder Brook**

March 20, 2007 **FIT: Yes**
Completion Date: **July 6, 2006**
Why Not assessed:
Rain: **Yes**

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	209	0
Railroads	0	0
Improved Paths	0	0
Development	93	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous w/	Sometimes	Never
W/in 1 Bankfill	Sometimes	Never
Texture	Bedrock	Not Evalua

1.5 Valley Features
Valley Width (ft) **1,470**
Width Determination **Estimated**
Confinement Type **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **No**

Notes:

historic straightening, minor bar scalping on bar mid-reach, lower 1/4 of reach below new bridge on 118 slightly wider bankful width than upper portion of reach, lots of large point bars, extensive channel work (rip rap, tree planting, planform changes) for several hundred feet upstream of new bridge on Rt. 118, historic dredging noted on phase 1, no active dredging observed except for bar scalping noted above

Step 2. Stream Channel

2.1 Bankfull Width	112
2.2 Max Depth (ft)	6.00
2.3 Mean Depth (ft)	4.90
2.4 Floodprone Width (ft)	750
2.5 Aband. Floodpln	7.50
2.6 Width/Depth Ratio	22.86
2.7 Entrenchment Ratio	6.70
2.8 Incision Ratio	1.25
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	600

2.12 Substrate Composition

Bedrock	1 %
Boulder	0 %
Cobble	1 %
Coarse Gravel	40 %
Fine Gravel	26 %
Sand	32 %

Silt/Clay Present? **Yes**
Detritus **20** %
Large Woody **42**

2.13 Average Largest Particle on

Bed	163.0	mm
Bar	72.0	mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	341	93
Erosion Height (ft)	7.00	8.00
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	1,634	1,446

Near Bank Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Deciduous	Deciduous

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

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	26-50	26-50
Sub-dominant	5-25	5-25

Buffer Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Mixed Trees	Mixed Trees

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Hay	Crop
Sub-dominant	Forest	Hay

	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	1
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	11	6

Diagonal	Delta	Island
2	1	1

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	0	0	1

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 **Yes**
Straightening Length: **1,080**
5.5 Dredging **Dredging**

Note:
Step 1.6 - Grade Controls and Step 4.8 - Channel Constrictions are on The second page of this report - Steps 6 through 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	**144.**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				
Bridge	**73.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				

Narrative:
historic minor degradation, active minor aggradation and widening

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**Yes**
7.2 Channel Aggradation	**15**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**56**		
Geomorphic Rating	**0.7**		

Channel Evolution Model **F**
Channel Evolution Stage **III**
Geomorphic Condition **Good**
Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**14**
6.2 Embeddedness	**9**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**11**
6.5 Channel Flow Status	**14**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 7 Right: 7**
6.10 Riparian Vegetation Zone Width	**Left: 5 Right: 5**
Total Score	**136**
Habitat Rating	**0.68**

Habitat Stream Condition **Good**

Project: **Trout River Mouth**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **15,792**

Phase 2 Segment Summary

Reach # **M02** Segment: **0**
Observers: **Adam Robtoy, E. Crandell**
Segment Location: **from Alder Brook confluence to Black Falls Brook**

March 20, 2007 **FIT: Yes**
Completion Date: **August 18, 2006**
Why Not assessed:
Rain: **No**

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	783	106
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous w/	Sometimes	Never
W/in 1 Bankfull	Sometimes	Never
Texture	Bedrock	Not Evalua

1.5 Valley Features
Valley Width (ft) **1,214**
Width Determination **Estimated**
Confinement Type **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

Lots of large point bars - aggradation and planform adjustments, portion of reach downstream of longley bridge slightly more incised (1.7) than remander of reach. historic dredging noted in phase 1 assessment, no active dredging observed

Step 2. Stream Channel

2.1 Bankfull Width	102
2.2 Max Depth (ft)	4.20
2.3 Mean Depth (ft)	2.80
2.4 Floodprone Width (ft)	900
2.5 Aband. Floodpln	5.90
2.6 Width/Depth Ratio	36.43
2.7 Entrenchment Ratio	8.82
2.8 Incision Ratio	1.40
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	600

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	30 %
Coarse Gravel	56 %
Fine Gravel	8 %
Sand	5 %

Silt/Clay Present? **No**
Detritus **5 %**
Large Woody **39**

2.13 Average Largest Particle on

Bed	140.0	mm
Bar	100.0	mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	2,806	1,273
Erosion Height (ft)	6.57	5.86
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	154	316

Near Bank Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

Bank Canopy	Left	Right
Canopy %	26-50	26-50
Mid-Channel Canopy		Open

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	5-25
Sub-dominant	5-25	26-50
Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Herbaceous	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Crop
Sub-dominant	Crop	Forest

	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
1	22	4

Diagonal	Delta	Island
2	1	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.
4	0	No

5.4 Stream Ford or Animal **No**
5.5 Straightening **Yes**
Straightening Length: **1,372**
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: **Trout River** Reach # **M02** Segment: **0** Completion Date: **August 18, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, E. Crandell** Rain: **No**

Segment Length (ft): **15,792** Segment Location: **from Alder Brook confluence to Black Falls Brook**

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	**90.0**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				
Bridge	**160.**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**10**		**No**
7.4 Change in Planform	**12**		**No**
Total Score	**47**		
Geomorphic Rating	**0.5875**		

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	**11**
6.3 Velocity/Depth Patterns	**18**
6.4 Sediment Deposition	**6**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**15**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 6 Right: 7**
6.9 Bank Vegetation Protection	**Left: 9 Right: 6**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 6**
Total Score	**132**
Habitat Rating	**0.66**

Habitat Stream Condition **Good**

Narrative:

historic degradation, active aggradation, widening and planform adjustments

Project: **Trout River Mouth**
Stream: **Unnamed 1 to M1**
Organization: **Johnson Company**
Segment Length (ft): **3,516**

Phase 2 Segment Summary

Reach # **M1S1.01** Segment: **0**
Observers: **Adam Robtoy, P.Stanley** Why Not assessed:
Segment Location: **From confluence with Trout to ~3/4 mi upstream**

March 20, 2007 **FIT: Yes**
Completion Date: **September 20, 2006**
Rain: **Yes**

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	768	0
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Sometimes	Sometimes
Texture	Other	Other

1.5 Valley Features
Valley Width (ft) **180**
Width Determination **Estimated**
Confinement Type **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

Stream runs through barnyard.
Cows in stream, upstream of culvert slightly less incised (1.8)

Step 2. Stream Channel

2.1 Bankfull Width	20
2.2 Max Depth (ft)	2.00
2.3 Mean Depth (ft)	1.20
2.4 Floodprone Width (ft)	28
2.5 Aband. Floodpln	4.00
2.6 Width/Depth Ratio	16.67
2.7 Entrenchment Ratio	1.40
2.8 Incision Ratio	2.00
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	100

2.12 Substrate Composition

Bedrock	2 %
Boulder	5 %
Cobble	31 %
Coarse Gravel	43 %
Fine Gravel	15 %
Sand	4 %

Silt/Clay Present?	Yes
Detritus	20 %
# Large Woody	5

2.13 Average Largest Particle on

Bed	80.0	mm
Bar	75.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt/Clay	Silt/Clay
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	258	510
Erosion Height (ft)	4.67	3.57
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	132	239

Near Bank Veg. Type	Left	Right
Dominant	Pasture	Pasture
Sub-dominant	Herbaceous	Herbaceous

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-Channel Canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	<5	<5
Sub-dominant	5-25	5-25

Buffer Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Pasture	Pasture
Sub-dominant	Hay	Hay

	Amount	Mean Height
Mass Failures	One	12.00
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	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
1	10	5

Diagonal	Delta	Island
0	1	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.
2	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: **Trout River Mouth** — **Phase 2 Reach Summary**

Stream: **Unnamed 1 to M1** — Reach # **M1S1.01** — Segment: **C** — Completion Date: **September 20,** — March 20, 2007

Organization: **Johnson Company** — Observers: **Adam Robtoy, P.Stanley** — Rain: **Yes**

Segment Length (ft): **3,516** — Segment Location: **From confluence with Trout to ~3/4 mi 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	**11.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				
Instream	**9.00**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Scour Below**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**5**		**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**14**		**No**
Total Score	**47**		
Geomorphic Rating	**0.5875**		

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	**8**
6.2 Embeddedness	**8**
6.3 Velocity/Depth Patterns	**11**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**11**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 7 Right: 6**
6.9 Bank Vegetation Protection	**Left: 3 Right: 3**
6.10 Riparian Vegetation Zone Width	**Left: 2 Right: 2**
Total Score	**104**
Habitat Rating	**0.52**

Habitat Stream Condition **Fair**

Narrative:

Major historic degradation, active widening particularly downstream of RT. 118 culvert and upstream of Woodward Neighboorhood road culvert

Project: **Trout River Mouth**
Stream: **Unnamed 3 to M2**
Organization: **Johnson Company**
Segment Length (ft): **1,700**

Phase 2 Segment Summary

Reach # **M2S3.01** Segment: **0**
Observers: **Adam Robtoy, Paul Stanley**
Segment Location: **From confluence with Trout to just upstream of Longley Bridge Road**

March 20, 2007 **FIT: Yes**
Completion Date: **September 20, 2006**
Why Not assessed:
Rain: **Yes**

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	49
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Sometimes	Sometimes
Texture	Bedrock	Bedrock

1.5 Valley Features
Valley Width (ft): **537**
Width Determination: **Measured**
Confinement Type: **Very Broad**
Rock Gorge?: **No**
Human-caused changed valley width?: **no**

Notes:

upper 300 feet of reach above culvert on Longley Bridge Road is steeper and should be included in M2S3.02. This portion was not segmented as it was so short and so similar to M2S3.02

bankful indicators included benchs along both banks at similar heights, and the top of gravel bar

Step 2. Stream Channel

2.1 Bankfull Width	15
2.2 Max Depth (ft)	1.70
2.3 Mean Depth (ft)	1.00
2.4 Floodprone Width (ft)	36
2.5 Aband. Floodpln	2.80
2.6 Width/Depth Ratio	15.00
2.7 Entrenchment Ratio	2.40
2.8 Incision Ratio	1.65
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	50

2.12 Substrate Composition

Bedrock	0 %
Boulder	4 %
Cobble	49 %
Coarse Gravel	26 %
Fine Gravel	18 %
Sand	3 %

Silt/Clay Present?: **No**
Detritus: **20 %**
Large Woody: **7**

2.13 Average Largest Particle on

Bed	150.0	mm
Bar	120.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	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)	46	59
Erosion Height (ft)	3.00	4.00
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	248	186

Near Bank Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Deciduous	Pasture

Bank Canopy	Left	Right
Canopy %	1-25	1-25

Mid-Channel Canopy: **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	5-25	<5
Sub-dominant	26-50	5-25

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Herbaceous	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Pasture	Pasture
Sub-dominant	Hay	Hay

	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	6	3

Diagonal	Delta	Island
0	1	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: **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: **Trout River Mouth** — **Phase 2 Reach Summary**

Stream: **Unnamed 3 to M2** — Reach # **M2S3.01** — Segment: **C** — Completion Date: **September 20,** — March 20, 2007

Organization: **Johnson Company** — Observers: **Adam Robtoy, Paul Stanley** — Rain: **Yes**

Segment Length (ft): **1,700** — Segment Location: **From confluence with Trout to just upstream of Longley Bridge 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	**7.00**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**12**	**None**	**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**17**		**No**
7.4 Change in Planform	**18**		**No**
Total Score	**63**		
Geomorphic Rating	**0.7875**		

Channel Evolution Model **F**

Channel Evolution Stage **II**

Geomorphic Condition **Good**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**10**
6.2 Embeddedness	**14**
6.3 Velocity/Depth Patterns	**11**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**13**
6.6 Channel Alteration	**16**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 7 Right: 5**
6.10 Riparian Vegetation Zone Width	**Left: 3 Right: 2**
Total Score	**130**
Habitat Rating	**0.65**

Habitat Stream Condition **Good**

Narrative:

Minor degradation, no other adjustments observed

Project: **Trout River Mouth**
Stream: **Unnamed 3 to M2**
Organization: **Johnson Company**
Segment Length (ft): **7,331**

Phase 2 Segment Summary

Reach # **M2S3.02** Segment: **0**
Observers: **Adam Robtoy, Paul Stanley** Why Not assessed:
Segment Location: **from M2S3.02 to Head Quaters**

March 20, 2007 **FIT: Yes**
Completion Date: **September 21, 2006**
Rain: **Yes**

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	33
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfull	Sometimes	Sometimes
Texture	Bedrock	Bedrock

1.5 Valley Features
Valley Width (ft) **50**
Width Determination **Measured**
Confinement Type **Semi-confined**
Rock Gorge? **No**
Human-caused changed valley width? **No**

Notes:

several bedrock grade controls located in the lower 1/2 of reach, several large mass failures where stream bumps into valley wall

Step 2. Stream Channel

2.1 Bankfull Width	17
2.2 Max Depth (ft)	1.90
2.3 Mean Depth (ft)	1.20
2.4 Floodprone Width (ft)	27
2.5 Aband. Floodpln	3.70
2.6 Width/Depth Ratio	14.17
2.7 Entrenchment Ratio	1.59
2.8 Incision Ratio	1.95
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	75

2.12 Substrate Composition

Bedrock	2 %
Boulder	6 %
Cobble	50 %
Coarse Gravel	31 %
Fine Gravel	9 %
Sand	2 %

Silt/Clay Present?	No
Detritus	15 %
# Large Woody	72

2.13 Average Largest Particle on

Bed	250.0	mm
Bar	150.0	mm

2.14 Stream Type
Stream Type: **B**
Bed Material: **Cobble**
Subclass Slope: **a**
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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	297	290
Erosion Height (ft)	5.40	5.40
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0

Near Bank Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Coniferous	Coniferous

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-Channel Canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	5-25	5-25
Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Forest
Sub-dominant	Pasture	Pasture

	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	None
4.3 Flow Status	Moderate
4.4 # of Debris Jams	5
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	12	22

Diagonal	Delta	Island
0	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 **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.

Stream: **Unnamed 3 to M2** Reach # **M2S3.02** Segment: **0** Completion Date: **September 21,**

Organization: **Johnson Company** Observers: **Adam Robtoy, Paul Stanley** Rain: **Yes**

Segment Length (ft): **7,331** Segment Location: **from M2S3.02 to Head Quaters**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Mid-Segment**	**20.00**	**15.00**		
Waterfall	**Upstream**	**8.00**	**5.00**		
Waterfall	**Upstream**	**30.00**	**20.00**		
Waterfall	**Mid-Segment**	**6.00**	**4.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Instream	**5.00**	**Yes**	**Yes**	**Yes**	**Yes**

Problem **Scour Below**

Narrative:
Minor Planform

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**16**	**None**	**Yes**
7.2 Channel Aggradation	**18**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**15**		**No**

Total Score **64**

Geomorphic Rating **0.8**

Channel Evolution Model **F**

Channel Evolution Stage **III**

Geomorphic Condition **Good**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**18**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**17**
6.4 Sediment Deposition	**14**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**19**
6.7 Frequency of Riffles/Steps	**17**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 9**
Total Score	**167**
Habitat Rating	**0.835**

Habitat Stream Condition **Good**

Project: **Trout River Mouth**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 1** Reach # **T1.01** Segment: **9** Completion Date: **July 26, 2006**

Organization: **Johnson Company** Observers: **AWR, NBR** Why Not assessed: Rain: **Yes**

Segment Length (ft): **5,090** Segment Location: **1/4 mile south intersection of route 118 and Hopkins Bridge Road**

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	52
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Steep
Continuous w/	Sometimes	Never
W/in 1 Bankfill	Sometimes	Never
Texture	Bedrock	Not Evalua

1.5 Valley Features

Valley Width (ft): **627**

Width Determination: **Estimated**

Confinement Type: **Very Broad**

Rock Gorge? **No**

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

Notes:

lots of enlarged bars and steep riffles in lower portion of reach below road, upper ~500 feet slightly steeper with larger substrates. Neck cut-off/future avulsion at meander near confluence with Trout

Step 2. Stream Channel

2.1 Bankfull Width	37
2.2 Max Depth (ft)	3.10
2.3 Mean Depth (ft)	2.60
2.4 Floodprone Width (ft)	190
2.5 Aband. Floodpln	3.60
2.6 Width/Depth Ratio	14.23
2.7 Entrenchment Ratio	5.14
2.8 Incision Ratio	1.16
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	150

2.12 Substrate Composition

Bedrock	0 %
Boulder	1 %
Cobble	26 %
Coarse Gravel	48 %
Fine Gravel	16 %
Sand	9 %

Silt/Clay Present?	Yes
Detritus	2 %
# Large Woody	27

2.13 Average Largest Particle on

Bed	120.0	mm
Bar	100.0	mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	185	161
Erosion Height (ft)	4.00	5.25
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	251	401

Near Bank Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Herbaceous
Sub-dominant	Deciduous	Pasture

Bank Canopy	Left	Right
Canopy %	51-75	1-25

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	5-25
Sub-dominant	5-25	51-100

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Herbaceous
Sub-dominant	Herbaceous	Mixed Trees

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Hay
Sub-dominant	Hay	Pasture

	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	High
4.4 # of Debris Jams	2
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	24	2

Diagonal	Delta	Island
4	1	0

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	1	0	0

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
5	0	No

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **95**

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: **Unnamed Tributary 1** Reach # **T1.01** Segment: **0** Completion Date: **July 26, 2006**

Organization: **Johnson Company** Observers: **AWR, NBR** Rain: **Yes**

Segment Length (ft): **5,090** Segment Location: **1/4 mile south intersection of route 118 and Hopkins Bridge 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	**21.5**	**Yes**	**Yes**	**Yes**	**Yes**

Problem **Deposition Above,Deposition Below**

Narrative:
minor aggradation and widening

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**16**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**13**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**56**		
Geomorphic Rating	**0.7**		

Channel Evolution Model **F**
Channel Evolution Stage **III**
Geomorphic Condition **Good**
Stream Sensitivity **High**

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	**17**
6.4 Sediment Deposition	**10**
6.5 Channel Flow Status	**12**
6.6 Channel Alteration	**15**
6.7 Frequency of Riffles/Steps	**18**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 8 Right: 5**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 5**
Total Score	**144**
Habitat Rating	**0.72**

Habitat Stream Condition **Good**

Project: **Trout River Mouth**
Stream: **Unnamed Tributary 1**
Organization: **Johnson Company**
Segment Length (ft): **7,219**

Phase 2 Segment Summary

Reach # **T1.02** Segment: **0**
Observers: **Adam Robtoy, Brian Lerich**
Segment Location: **from T1-01 to just north of Wightman Hill Road**

March 20, 2007 **FIT: Yes**
Completion Date: **July 27, 2006**
Why Not assessed: Rain: **Yes**

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	0	108
Railroads	0	0
Improved Paths	0	0
Development	0	0

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

1.5 Valley Features
Valley Width (ft) **110**
Width Determination **Measured**
Confinement Type **Narrow**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

reach found to be in reference condition (B3a stream type), several bedrock grade controls throughout, wide woody buffers, not encroachments except for culvert along road

Step 2. Stream Channel

2.1 Bankfull Width	30
2.2 Max Depth (ft)	2.70
2.3 Mean Depth (ft)	1.90
2.4 Floodprone Width (ft)	60
2.5 Aband. Floodpln	3.50
2.6 Width/Depth Ratio	15.79
2.7 Entrenchment Ratio	2.00
2.8 Incision Ratio	1.30
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	75

2.12 Substrate Composition

Bedrock	6 %
Boulder	14 %
Cobble	52 %
Coarse Gravel	20 %
Fine Gravel	6 %
Sand	2 %

Silt/Clay Present?	No
Detritus	0 %
# Large Woody	11

2.13 Average Largest Particle on

Bed	250.0	mm
Bar	180.0	mm

2.14 Stream Type
Stream Type: **B**
Bed Material: **Cobble**
Subclass Slope: **a**
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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	118	0
Erosion Height (ft)	9.00	0.00
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0

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

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-Channel Canopy	Closed	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	51-100	51-100

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

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

	Amount	Mean Height
Mass Failures	Multiple	60.00
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
6	5	0

Diagonal	Delta	Island
0	1	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 **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: **Unnamed Tributary 1** Reach #: **T1.02** Segment: **0** Completion Date: **July 27, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Brian Lerich** Rain: **Yes**

Segment Length (ft): **7,219** Segment Location: **from T1-01 to just north of Wightman Hill Road**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPS Taken
Waterfall	**Upstream**	**30.00**	**30.00**		
Ledge	**Upstream**	**4.00**	**2.00**		
Ledge	**Upstream**	**4.00**	**2.00**		
Ledge	**Upstream**	**4.00**	**2.00**		
Ledge	**Upstream**	**4.00**	**2.00**		
Ledge	**Upstream**	**4.00**	**2.00**		
Ledge	**Mid-Segment**	**4.00**	**2.00**		
Ledge	**Mid-Segment**	**10.00**	**6.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Instream	**8.00**	**Yes**	**Yes**	**Yes**	**Yes**

Problem **Deposition Above**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**18**	**None**	**No**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**14**		
7.4 Change in Planform	**20**		
Total Score	**68**		
Geomorphic Rating	**0.85**		

Channel Evolution Model **F**

Channel Evolution Stage **I**

Geomorphic Condition **Referenc**

Stream Sensitivity **Low**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**18**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**20**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**20**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 9 Right: 10**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 10**
Total Score	**179**
Habitat Rating	**0.895**

Habitat Stream Condition **Referen**

Narrative:

Minor widening though reach still found to be in reference condtion, no major erosion noted

Project: **Trout River Mouth**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 2** Reach # **T2.01** Segment: **A** Completion Date: **September 14, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, DB** Why Not assessed: Rain: **Yes**

Segment Length (ft): **900** Segment Location: **From confluence with Trout to Route 118 Bridge.**

Step 1. Valley and Floodplain

1.1 Segmentation **Planform and Scope**

1.2 Alluvial Fan **Yes**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	0	0
Roads	0	108
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous w/	Never	Never
W/in 1 Bankfill	Never	Never
Texture	Not Evalua	Not Evalua

1.5 Valley Features

Valley Width (ft)	500
Width Determination	Estimated
Confinement Type	Very Broad
Rock Gorge?	No

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

Notes:

Alluvial fan portion of Reach. Bridge opening clogged with sediment. Very large point bar at confluence with Trout. historic dredging noted in phase 1, no active dredging observed

Step 2. Stream Channel

2.1 Bankfull Width	54
2.2 Max Depth (ft)	2.60
2.3 Mean Depth (ft)	1.90
2.4 Floodprone Width (ft)	300
2.5 Aband. Floodpln	3.30
2.6 Width/Depth Ratio	28.42
2.7 Entrenchment Ratio	5.56
2.8 Incision Ratio	1.27
2.9 Sinuosity	High
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	300

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	22 %
Coarse Gravel	41 %
Fine Gravel	25 %
Sand	11 %

Silt/Clay Present?	No
Detritus	5 %
# Large Woody	4

2.13 Average Largest Particle on

Bed	120.0	mm
Bar	95.0	mm

2.14 Stream Type

Stream Type:	C
Bed Material:	Gravel
Subclass Slope:	b
Bed Form:	Riffle-Pool

2.15 Reference Stream Type

(if different from Phase 1)

C 4 b Riffle-Pool

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

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

Bank Erosion	Left	Right
Erosion Length (ft)	69	58
Erosion Height (ft)	3.00	4.00
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0

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

Bank Canopy	Left	Right
Canopy %	26-50	1-25
Mid-Channel Canopy		Open

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	26-50	5-25
Sub-dominant	51-100	<5

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Invasives
Sub-dominant	Invasives	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Crop
Sub-dominant	Hay	Forest

	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	1	1

Diagonal	Delta	Island
0	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.
1	0	No

5.4 Stream Ford or Animal	No
5.5 Straightening	Yes
Straightening Length:	262
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: **Unnamed Tributary 2** Reach # **T2.01** Segment: **A** Completion Date: **September 14,**

Organization: **Johnson Company** Observers: **Adam Robtoy, DB** Rain: **Yes**

Segment Length (ft): **900** Segment Location: **From confluence with Trout to Route 118 Bridge.**

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	**130.**	**Yes**	**Yes**	**No**	**Yes**

Problem **Deposition Above,Deposition Below**

Narrative:
Aggradation/ Widening, alluvial fan portion of reach

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**Yes**
7.2 Channel Aggradation	**13**	**None**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**17**		**No**
Total Score	**58**		
Geomorphic Rating	**0.725**		

Channel Evolution Model **F**
Channel Evolution Stage **III**
Geomorphic Condition **Good**
Stream Sensitivity **Very High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**8**
6.2 Embeddedness	**10**
6.3 Velocity/Depth Patterns	**12**
6.4 Sediment Deposition	**6**
6.5 Channel Flow Status	**7**
6.6 Channel Alteration	**16**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 5 Right: 5**
6.10 Riparian Vegetation Zone Width	**Left: 4 Right: 2**
Total Score	**107**
Habitat Rating	**0.535**

Habitat Stream Condition **Fair**

Project: **Trout River Mouth**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 2** Reach # **T2.01** Segment: **B** Completion Date: **September 14, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, DB** Why Not assessed: Rain: **Yes**

Segment Length (ft): **1,301** Segment Location: **From Route 118 Bridge to Bedrock Gorge located ~1/4 mile upstream**

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	501	325
Railroads	0	0
Improved Paths	0	0
Development	0	236

1.4 Adjacent Side	Left	Right
Hillside Slope	Extremely	Extremely
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Sometimes	Sometimes
Texture	Bedrock	Bedrock

1.5 Valley Features

Valley Width (ft)	200
Width Determination	Measured
Confinement Type	Narrow
Rock Gorge?	Yes

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

Notes:

Bedrock Gorge located on upper 300 feet of reach, dominated by residential development on lower 1/2 of sub-reach, riprap dominates banks on both sides, historic dredging noted in phase 1, no active dredging observed

Step 2. Stream Channel

2.1 Bankfull Width	43
2.2 Max Depth (ft)	2.70
2.3 Mean Depth (ft)	2.20
2.4 Floodprone Width (ft)	68
2.5 Aband. Floodpln	5.10
2.6 Width/Depth Ratio	19.55
2.7 Entrenchment Ratio	1.58
2.8 Incision Ratio	1.89
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	150

2.12 Substrate Composition

Bedrock	0 %
Boulder	4 %
Cobble	38 %
Coarse Gravel	40 %
Fine Gravel	12 %
Sand	6 %

Silt/Clay Present?	No
Detritus	5 %
# Large Woody	2

2.13 Average Largest Particle on

Bed	200.0	mm
Bar	170.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Bedrock
Consistency	Non-cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0.00	0.00
Revetmt. Type	Rip-Rap	Multiple
Revetmt. Length (ft)	442	342

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

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

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	5-25	5-25
Sub-dominant	<5	<5

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Invasives	Invasives

3.3 Riparian Corridor

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

	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	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	0	0

Diagonal	Delta	Island
0	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: **212**

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.

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Upstream**	**30.00**	**25.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**20.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**Yes**
7.2 Channel Aggradation	**18**	**None**	**No**
7.3 Widening Channel	**16**		**No**
7.4 Change in Planform	**16**		**No**
Total Score	**63**		
Geomorphic Rating	**0.7875**		

Channel Evolution Model **F**
Channel Evolution Stage **II**
Geomorphic Condition **Good**
Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**12**
6.2 Embeddedness	**14**
6.3 Velocity/Depth Patterns	**14**
6.4 Sediment Deposition	**19**
6.5 Channel Flow Status	**18**
6.6 Channel Alteration	**18**
6.7 Frequency of Riffles/Steps	**15**
6.8 Bank Stability	**Left: 10 Right: 10**
6.9 Bank Vegetation Protection	**Left: 8 Right: 8**
6.10 Riparian Vegetation Zone Width	**Left: 4 Right: 4**
Total Score	**154**
Habitat Rating	**0.77**

Habitat Stream Condition **Good**

Narrative:
Historic Incision, highly encroached by development and rip-rap,

Project: **Trout River Head**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **13,386**

Phase 2 Segment Summary

Reach # **M03** Segment: **A**
Observers: **Adam Robtoy, E. Crandell**
Segment Location: **from M02 to braided segment 2200' downstream of end of M03**

March 20, 2007 **FIT: Yes**
Completion Date: **August 24, 2006**
Why Not assessed:
Rain: **Yes**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**
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	1,641	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Steep
Continuous w/	Sometimes	Never
W/in 1 Bankfill	Sometimes	Never
Texture	Bedrock	Not Evalua

1.5 Valley Features
Valley Width (ft): **1,991**
Width Determination: **Estimated**
Confinement Type: **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

historic gravel mining, extensive bar scalping just downstream of Vincents Bridge Road Bridge, bedrock gorge located just upstream of Comstock bridge

Step 2. Stream Channel

2.1 Bankfull Width	74
2.2 Max Depth (ft)	3.50
2.3 Mean Depth (ft)	2.80
2.4 Floodprone Width (ft)	500
2.5 Aband. Floodpln	4.90
2.6 Width/Depth Ratio	26.43
2.7 Entrenchment Ratio	6.76
2.8 Incision Ratio	1.40
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	400

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	14 %
Coarse Gravel	63 %
Fine Gravel	15 %
Sand	8 %

Silt/Clay Present? **No**
Detritus **0** %
Large Woody **28**

2.13 Average Largest Particle on

Bed	100.0	mm
Bar	75.0	mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	628	909
Erosion Height (ft)	5.20	5.50
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	195	1,649

Near Bank Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Deciduous	Deciduous

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

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

	Left	Right
Buffer Width		
Dominant	51-100	26-50
Sub-dominant	>100	51-100
Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Hay	Crop
Sub-dominant	Forest	Forest

	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	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	19	4

Diagonal	Delta	Island
1	1	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.
1	0	No

5.4 Stream Ford or Animal **Yes**
5.5 Straightening **No**
Straightening Length: **0**
5.5 Dredging **Dredging**

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: **Trout River** | Reach # **M03** | Segment: **A** | Completion Date: **August 24, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, E. Crandell** | Rain: **Yes**

Segment Length (ft): **13,386** | Segment Location: **from M02 to braided segment 2200' downstream of end of M03**

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	**45.0**	**No**	**No**	**Yes**	**Yes**
Problem	**Deposition Above**				
Bridge	**38.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Below,Scour Below**				
Bridge	**125.**	**Yes**	**Yes**	**No**	**Yes**
Problem	**Deposition Above**				
Bridge	**82.0**	**Yes**	**Yes**	**No**	**Yes**
Problem	**Scour Below**				

Narrative:
historic degradation, active minor widening and aggradation

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**11**	**None**	**Yes**
7.2 Channel Aggradation	**13**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**14**		**No**
Total Score	**50**		
Geomorphic Rating	**0.625**		

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	**15**
6.2 Embeddedness	**13**
6.3 Velocity/Depth Patterns	**16**
6.4 Sediment Deposition	**10**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**13**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 7**
Total Score	**142**
Habitat Rating	**0.71**

Habitat Stream Condition **Good**

Project: **Trout River Head**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **1,400**

Phase 2 Segment Summary

Reach # **M03** Segment: **B**
Observers: **Adam Robtoy, E. Crandell**
Segment Location: **Braided section of M03, from 3200' downstream of end of MO3 to 1200' downstream of end**

March 20, 2007 **FIT: Yes**
Completion Date: **August 24, 2006**
Why Not assessed:
Rain: **Yes**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**
1.2 Alluvial Fan **Yes**
1.3 Corridor Encroachments

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

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous w/	Never	Never
W/in 1 Bankfill	Never	Never
Texture	Not Evalua	Not Evalua

1.5 Valley Features
Valley Width (ft) **1,991**
Width Determination **Estimated**
Confinement Type **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

braided section which includes trout river restoration area,

Step 2. Stream Channel

2.1 Bankfull Width	190
2.2 Max Depth (ft)	2.90
2.3 Mean Depth (ft)	1.70
2.4 Floodprone Width (ft)	700
2.5 Aband. Floodpln	3.70
2.6 Width/Depth Ratio	111.76
2.7 Entrenchment Ratio	3.68
2.8 Incision Ratio	1.28
2.9 Sinuosity	Low
2.10 Riffles Type	Not Applicable
2.11 Riffle/Step Spacing (ft)	0

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	8 %
Coarse Gravel	51 %
Fine Gravel	29 %
Sand	12 %

Silt/Clay Present?	No
Detritus	0 %
# Large Woody	15

2.13 Average Largest Particle on

Bed	90.0	mm
Bar	80.0	mm

2.14 Stream Type
Stream Type: **D**
Bed Material: **Gravel**
Subclass Slope: **None**
Bed Form: **Braided**
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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	88	0
Erosion Height (ft)	4.00	0.00
Revetmt. Type	None	Rip-Rap
Revetmt. Length (ft)	0	191

Near Bank Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Herbaceous	Herbaceous

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-Channel Canopy		Open

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	51-100	26-50
Sub-dominant	26-50	51-100

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Hay
Sub-dominant	Crop	Forest

	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	Some
4.3 Flow Status	Moderate
4.4 # of Debris Jams	1
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	2	0

Diagonal	Delta	Island
0	0	2

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
1	0	0	3

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.

Stream: **Trout River** | Reach # **M03** | Segment: **B** | Completion Date: **August 24, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, E. Crandell** | Rain: **Yes**

Segment Length (ft): **1,400** | Segment Location: **Braided section of M03, from 3200' downstream of end of MO3 to 1200' downstream of**

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 **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**Yes**
7.2 Channel Aggradation	**8**	**C to D**	**No**
7.3 Widening Channel	**6**		**No**
7.4 Change in Planform	**12**		**No**
Total Score	**39**		
Geomorphic Rating	**0.4875**		
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	**5**
6.2 Embeddedness	**7**
6.3 Velocity/Depth Patterns	**8**
6.4 Sediment Deposition	**3**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**15**
6.7 Frequency of Riffles/Steps	**9**
6.8 Bank Stability	**Left: 8 Right: 10**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 8**
Total Score	**109**
Habitat Rating	**0.545**
Habitat Stream Condition	**Fair**

Narrative:

major aggradation and widening, braided D type channel

Project: **Trout River Head**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **2,000**

Phase 2 Segment Summary

Reach # **M03**
Observers: **Adam Robtoy, E. Crandell**
Segment Location: **Upstream end of M03 (2,000' long)**

March 20, 2007 **FIT: Yes**
Segment: **C** Completion Date: **August 24, 2006**
Why Not assessed: Rain: **Yes**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**
1.2 Alluvial Fan **None**
1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	0	0
Roads	983	0
Railroads	0	0
Improved Paths	0	0
Development	0	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Steep
Continuous w/	Never	Never
W/in 1 Bankfill	Never	Never
Texture	Not Evalua	Not Evalua

1.5 Valley Features
Valley Width (ft) **1,991**
Width Determination **Estimated**
Confinement Type **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

historic straightening, segment just upstream of braided segment B

Step 2. Stream Channel

2.1 Bankfull Width	74
2.2 Max Depth (ft)	3.50
2.3 Mean Depth (ft)	2.80
2.4 Floodprone Width (ft)	500
2.5 Aband. Floodpln	4.90
2.6 Width/Depth Ratio	26.43
2.7 Entrenchment Ratio	6.76
2.8 Incision Ratio	1.40
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	400

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	14 %
Coarse Gravel	63 %
Fine Gravel	15 %
Sand	8 %

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

2.13 Average Largest Particle on

Bed	100.0	mm
Bar	75.0	mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	0
Erosion Height (ft)	0.00	0.00
Revetmt. Type	None	Rip-Rap
Revetmt. Length (ft)	0	390

Near Bank Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Herbaceous
Sub-dominant	Herbaceous	Shrubs/Saplin

Bank Canopy	Left	Right
Canopy %	26-50	1-25
Mid-Channel Canopy		Open

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	5-25	<5
Sub-dominant	26-50	5-25

Buffer Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Mixed Trees	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Crop	Shrubs/Saplin
Sub-dominant	Forest	Residential

	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	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
1	3	0

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.
1	0	No

5.4 Stream Ford or Animal **Yes**
5.5 Straightening **Yes**
Straightening Length: **397**
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: **Trout River** | Reach # **M03** | Segment: **C** | Completion Date: **August 24, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, E. Crandell** | Rain: **Yes**

Segment Length (ft): **2,000** | Segment Location: **Upstream end of M03 (2,000' long)**

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 **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**11**	**None**	**Yes**
7.2 Channel Aggradation	**13**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**14**		**No**
Total Score	**50**		
Geomorphic Rating	**0.625**		

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	**15**
6.2 Embeddedness	**13**
6.3 Velocity/Depth Patterns	**16**
6.4 Sediment Deposition	**10**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**13**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 8 Right: 8**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 7**
Total Score	**142**
Habitat Rating	**0.71**

Habitat Stream Condition **Good**

Narrative:

historic degradation, active minor aggradation, widening, and planform adjustments

Project: **Trout River Head**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **4,712**

Phase 2 Segment Summary

Reach # **M04**
Observers: **Adam Robtoy, E. Crandell, B.**
Segment Location: **from M03 to confluence with Hannah Clark Brook**

March 20, 2007 **FIT: Yes**
Segment: **0**
Completion Date: **August 16, 2006**
Why Not assessed:
Rain: **No**

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	1,462	935
Railroads	0	0
Improved Paths	0	0
Development	1,618	994

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Sometimes	Sometimes
Texture	Bedrock	Bedrock

1.5 Valley Features
Valley Width (ft) **862**
Width Determination **Estimated**
Confinement Type **Very Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

historic straightening, upper 500 feet of reach dominated by bedrock gorge, streamtype F3 due to incision, though some parts of reach slightly less entrenched than the 2.2 in cross section
historic dredging noted in phase 1, no active dredging observed, reach dominated by rip-rap and residential development on right bank

Step 2. Stream Channel

2.1 Bankfull Width	62
2.2 Max Depth (ft)	3.60
2.3 Mean Depth (ft)	2.70
2.4 Floodprone Width (ft)	80
2.5 Aband. Floodpln	7.80
2.6 Width/Depth Ratio	22.96
2.7 Entrenchment Ratio	1.29
2.8 Incision Ratio	2.17
2.9 Sinuosity	Low
2.10 Riffles Type	Not Applicable
2.11 Riffle/Step Spacing (ft)	0

2.12 Substrate Composition

Bedrock	0 %
Boulder	6 %
Cobble	60 %
Coarse Gravel	21 %
Fine Gravel	11 %
Sand	2 %

Silt/Clay Present? **No**
Detritus **0 %**
Large Woody **4**

2.13 Average Largest Particle on

Bed	250.0	mm
Bar	200.0	mm

2.14 Stream Type
Stream Type: **F**
Bed Material: **Cobble**
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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	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)	103	0
Erosion Height (ft)	4.00	0.00
Revetmt. Type	Multiple	Rip-Rap
Revetmt. Length (ft)	655	2,453

Near Bank Veg. Type	Left	Right
Dominant	Deciduous	Lawn
Sub-dominant	Pasture	Deciduous

Bank Canopy	Left	Right
Canopy %	51-75	1-25

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	<5
Sub-dominant	5-25	5-25

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Herbaceous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

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

	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
0	2	1

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: **2,529**
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: **Trout River** | Reach # **M04** | Segment: **0** | Completion Date: **August 16, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, E. Crandell, B.** | Rain: **No**

Segment Length (ft): **4,712** | Segment Location: **from M03 to confluence with Hannah Clark Brook**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Upstream**	**4.00**	**3.00**		
Waterfall	**Upstream**	**10.00**	**6.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	**52.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				
Bedrock	**30.0**	**No**	**No**	**Yes**	**Yes**
Problem	**None**				
Bridge	**65.0**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				

Narrative:
Historic degradation, B to F,

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**B to F**	**Yes**
7.2 Channel Aggradation	**15**	**None**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**49**		
Geomorphic Rating	**0.6125**		

Channel Evolution Model **F**
Channel Evolution Stage **II**
Geomorphic Condition **Fair**
Stream Sensitivity **Very High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**12**
6.2 Embeddedness	**12**
6.3 Velocity/Depth Patterns	**10**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**14**
6.6 Channel Alteration	**6**
6.7 Frequency of Riffles/Steps	**10**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 8 Right: 3**
6.10 Riparian Vegetation Zone Width	**Left: 8 Right: 2**
Total Score	**115**
Habitat Rating	**0.575**

Habitat Stream Condition **Fair**

Project: **Trout River Head**
Stream: **Trout River**
Organization: **Johnson Company**
Segment Length (ft): **6,340**

Phase 2 Segment Summary

Reach # **M05** Segment: **0**
Observers: **Adam Robtoy, E. Crandell**
Segment Location: **from M04 to confluence of Wade Brook and Jay Brook**

March 20, 2007 **FIT: Yes**
Completion Date: **August 25, 2006**
Why Not assessed: Rain: **Yes**

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	0

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

1.5 Valley Features
Valley Width (ft) **426**
Width Determination **Estimated**
Confinement Type **Broad**
Rock Gorge? **No**
Human-caused changed valley width? **no**

Notes:

Based on VT DEC info. historic dredging occurred in reach after 1997 flood. No evidence of this was observed during the Phase 2. lots of side bars noted, minor degradation, several bedrock grade controls located throughout,

Step 2. Stream Channel

2.1 Bankfull Width	60
2.2 Max Depth (ft)	3.20
2.3 Mean Depth (ft)	2.40
2.4 Floodprone Width (ft)	120
2.5 Aband. Floodpln	4.60
2.6 Width/Depth Ratio	25.00
2.7 Entrenchment Ratio	2.00
2.8 Incision Ratio	1.44
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	150

2.12 Substrate Composition

Bedrock	2 %
Boulder	9 %
Cobble	48 %
Coarse Gravel	26 %
Fine Gravel	11 %
Sand	4 %

Silt/Clay Present? **No**
Detritus **0** %
Large Woody **26**

2.13 Average Largest Particle on

Bed	250.0	mm
Bar	200.0	mm

2.14 Stream Type
Stream Type: **C**
Bed Material: **Cobble**
Subclass Slope: **b**
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	**Gravel**	**Gravel**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Bedrock**	**Bedrock**
Consistency	**Cohesive**	**Cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	86	0
Erosion Height (ft)	8.00	0.00
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0

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

Bank Canopy	Left	Right
Canopy %	51-75	51-75
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	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**Shrubs/Saplin**	**Shrubs/Saplin**

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	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	5	17

Diagonal	Delta	Island
0	0	2

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 **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.

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPS Taken
Waterfall	**Downstream**	**40.00**	**40.00**		
Waterfall	**Mid-Segment**	**6.00**	**6.00**		
Waterfall	**Downstream**	**6.00**	**6.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**20.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**Yes**
7.2 Channel Aggradation	**17**	**None**	**No**
7.3 Widening Channel	**14**		**No**
7.4 Change in Planform	**20**		**No**
Total Score	**65**		
Geomorphic Rating	**0.8125**		

Channel Evolution Model	**F**
Channel Evolution Stage	**III**
Geomorphic Condition	**Good**
Stream Sensitivity	**Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**17**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**20**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**20**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 10 Right: 10**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 9**
Total Score	**169**
Habitat Rating	**0.845**
Habitat Stream Condition	**Referen**

Narrative:
historic minor degradation, active minor widening, possible historic dredging after 1997 flood, but several grade controls located throughout prevented major impacts from dredging

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 3 to Trout** Reach # **T3.01** Segment: **A** Completion Date: **August 1, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, JPR** Why Not assessed: Rain: **Yes**

Segment Length (ft): **2,000** Segment Location: **From confluence with Trout River to just downstream of Fuller Bridge.**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**

1.2 Alluvial Fan **Yes**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	0	0
Roads	999	0
Railroads	0	0
Improved Paths	0	0
Development	311	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous w/	Never	Never
W/in 1 Bankfill	Never	Never
Texture	Not Evalua	Not Evalua

1.5 Valley Features

Valley Width (ft) **715**

Width Determination **Estimated**

Confinement Type **Very Broad**

Rock Gorge? **No**

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

Notes:

Lower end of reach on alluvial fan, trailer located in flood plain near lower end of segment. historic dredging within reach based on data from VT DEC, though no active dredging observed.

Step 2. Stream Channel

2.1 Bankfull Width	54
2.2 Max Depth (ft)	3.50
2.3 Mean Depth (ft)	2.30
2.4 Floodprone Width (ft)	120
2.5 Aband. Floodpln	5.10
2.6 Width/Depth Ratio	23.48
2.7 Entrenchment Ratio	2.22
2.8 Incision Ratio	1.46
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	120

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	26 %
Coarse Gravel	56 %
Fine Gravel	14 %
Sand	4 %

Silt/Clay Present?	No
Detritus	0 %
# Large Woody	4

2.13 Average Largest Particle on

Bed	140.0	mm
Bar	120.0	mm

2.14 Stream Type

Stream Type: **C**

Bed Material: **Gravel**

Subclass Slope: **b**

Bed Form: **Riffle-Pool**

2.15 Reference Stream Type

(if different from Phase 1)

C 4 Non Riffle-Pool

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope **Steep**

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

Bank Erosion	Left	Right
Erosion Length (ft)	54	0
Erosion Height (ft)	6.00	0.00
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	327	17

Near Bank Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Lawn Shrubs/Saplin	

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-Channel Canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	5-25	26-50
Sub-dominant	26-50	5-25

Buffer Veg. Type	Left	Right
Dominant	Herbaceous Shrubs/Saplin	
Sub-dominant	Shrubs/Saplin	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Crop
Sub-dominant	Residential	Hay

	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	High
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	3	0

Diagonal	Delta	Island
0	1	1

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
2	0	1	0

5.3 Steep Riffles and Head Cuts

Steep Riffles	Head Cuts	Trib Rejuv.
2	0	No

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **691**

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: **Unnamed Tributary 3 to Trout** Reach # **T3.01** Segment: **A** Completion Date: **August 1, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, JPR** Rain: **Yes**

Segment Length (ft): **2,000** Segment Location: **From confluence with Trout River to just downstream of Fuller Bridge.**

1.6 Grade Controls

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

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**13**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**12**		**No**
Total Score	**49**		
Geomorphic Rating	**0.6125**		

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	**13**
6.2 Embeddedness	**11**
6.3 Velocity/Depth Patterns	**13**
6.4 Sediment Deposition	**13**
6.5 Channel Flow Status	**9**
6.6 Channel Alteration	**9**
6.7 Frequency of Riffles/Steps	**15**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 8 Right: 8**
6.10 Riparian Vegetation Zone Width	**Left: 5 Right: 5**
Total Score	**127**
Habitat Rating	**0.635**

Habitat Stream Condition **Good**

Narrative:

Historic degradation, active aggradation, widening and plaform. Historic dredging based on info. from VT DEC. No active dredging observed. alluvial fan portion of reach, mobile home located in floodplain

Project: **Trout River Head** | **Phase 2 Segment Summary** | page 1 of 2 | March 20, 2007 | **FIT: Yes**

Stream: **Unnamed Tributary 3 to Trout** | Reach # **T3.01** | Segment: **B** | Completion Date: **August 1, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, JPR** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **2,348** | Segment Location: **From just downstream of Fuller Bridge to Black Falls road bridge.**

Step 1. Valley and Floodplain

1.1 Segmentation **Channel Dimensions**

1.2 Alluvial Fan **None**

1.3 Corridor Encroachments

Length (ft)	One	Both
Berms	0	0
Roads	1,044	1,276
Railroads	0	0
Improved Paths	0	0
Development	1,166	587

1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Very Steep
Continuous w/	Never	Sometimes
W/in 1 Bankfill	Never	Sometimes
Texture	Not Evalua	Bedrock

1.5 Valley Features

Valley Width (ft) **200**

Width Determination **Estimated**

Confinement Type **Narrow**

Rock Gorge? **No**

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

Notes:

Nearly entire Reach Rip-rap on both banks. Failed Rip-rap on left bank near trailer. Erosion threatening trailer. historic dredging based on data from VT DEC, though no active dredging observed. Exact location of dredgin unknown.

Step 2. Stream Channel

2.1 Bankfull Width	38
2.2 Max Depth (ft)	3.80
2.3 Mean Depth (ft)	2.60
2.4 Floodprone Width (ft)	85
2.5 Aband. Floodpln	5.90
2.6 Width/Depth Ratio	14.62
2.7 Entrenchment Ratio	2.24
2.8 Incision Ratio	1.55
2.9 Sinuosity	Moderate
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	120

2.12 Substrate Composition

Bedrock	0 %
Boulder	18 %
Cobble	54 %
Coarse Gravel	26 %
Fine Gravel	2 %
Sand	0 %

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

2.13 Average Largest Particle on

Bed	500.0	mm
Bar	200.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Bedrock
Consistency	Non-cohesive	Cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	97	0
Erosion Height (ft)	7.00	0.00
Revetmt. Type	Rip-Rap	Multiple
Revetmt. Length (ft)	1,830	1,635

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

Bank Canopy	Left	Right
Canopy %	1-25	1-25

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	5-25	5-25
Sub-dominant	26-50	26-50

Buffer Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Mixed Trees	Mixed Trees

3.3 Riparian Corridor

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

	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	High
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	1	1

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.
0	0	No

5.4 Stream Ford or Animal **No**

5.5 Straightening **Yes**

Straightening Length: **2,588**

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: **Unnamed Tributary 3 to Trout** Reach # **T3.01** Segment: **B** Completion Date: **August 1, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, JPR** Rain: **Yes**

Segment Length (ft): **2,348** Segment Location: **From just downstream of Fuller Bridge to Black Falls road bridge.**

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	**35.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**None**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**Yes**
7.2 Channel Aggradation	**18**	**None**	**No**
7.3 Widening Channel	**15**		
7.4 Change in Planform	**17**		
Total Score	**64**		
Geomorphic Rating	**0.8**		

Channel Evolution Model **F**

Channel Evolution Stage **II**

Geomorphic Condition **Good**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**13**
6.2 Embeddedness	**16**
6.3 Velocity/Depth Patterns	**16**
6.4 Sediment Deposition	**20**
6.5 Channel Flow Status	**19**
6.6 Channel Alteration	**7**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 5 Right: 5**
6.10 Riparian Vegetation Zone Width	**Left: 5 Right: 5**
Total Score	**145**
Habitat Rating	**0.725**

Habitat Stream Condition **Good**

Narrative:

Historic degradation, reach dominated by rip-rap, residential encroachment along portions of both banks

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 3 to Trout** Reach # **T3.02** Segment: **0** Completion Date: **August 4, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Evan Crandell** Why Not assessed: Rain: **Yes**

Segment Length (ft): **6,971** Segment Location: **from Black Falls Road Bridge to Bedrock Falls ~1 mile upstream**

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	155	0
Railroads	0	0
Improved Paths	0	0
Development	0	0

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

1.5 Valley Features

Valley Width (ft) **90**

Width Determination **Estimated**

Confinement Type **Semi-confined**

Rock Gorge? **No**

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

Notes:

Step 2. Stream Channel

2.1 Bankfull Width	44
2.2 Max Depth (ft)	3.50
2.3 Mean Depth (ft)	2.50
2.4 Floodprone Width (ft)	77
2.5 Aband. Floodpln	3.50
2.6 Width/Depth Ratio	17.60
2.7 Entrenchment Ratio	1.75
2.8 Incision Ratio	1.00
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	100

2.12 Substrate Composition

Bedrock	5 %
Boulder	13 %
Cobble	52 %
Coarse Gravel	23 %
Fine Gravel	5 %
Sand	2 %

Silt/Clay Present?	No
Detritus	5 %
# Large Woody	38

2.13 Average Largest Particle on

Bed	2000.0	mm
Bar	250.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	231	56
Erosion Height (ft)	8.00	7.00
Revetmt. Type	Rip-Rap	None
Revetmt. Length (ft)	97	0

Near Bank Veg. Type	Left	Right
Dominant	Deciduous	Deciduous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

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

Mid-Channel Canopy **Closed**

3.2 Riparian Buffer

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

Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

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

	Amount	Mean Height
Mass Failures	One	40.00
Gullies	None	0.00

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps	Some
4.2 Adjacent Wetlands	Some
4.3 Flow Status	High
4.4 # of Debris Jams	2
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	3	6

Diagonal	Delta	Island
0	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 **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: **Unnamed Tributary 3 to Trout** Reach # **T3.02** Segment: **0** Completion Date: **August 4, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Evan Crandell** Rain: **Yes**

Segment Length (ft): **6,971** Segment Location: **from Black Falls Road Bridge to Bedrock Falls ~1 mile upstream**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Upstream**	**40.00**	**35.00**		
Ledge	**Mid-Segment**	**6.00**	**2.00**		
Ledge	**Downstream**	**5.00**	**2.00**		
Ledge	**Downstream**	**0.00**	**0.00**		
Ledge	**Downstream**	**0.00**	**0.00**		
Ledge	**Upstream**	**0.00**	**0.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**20.0**	**Yes**	**No**	**Yes**	**Yes**
Problem		**Deposition Above**			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**16**	**None**	**No**
7.2 Channel Aggradation	**19**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**19**		**No**

Total Score **69**

Geomorphic Rating **0.8625**

Channel Evolution Model **F**

Channel Evolution Stage **I**

Geomorphic Condition **Referenc**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**17**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**19**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**14**
6.6 Channel Alteration	**19**
6.7 Frequency of Riffles/Steps	**18**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 9**
Total Score	**171**
Habitat Rating	**0.855**

Habitat Stream Condition **Referen**

Narrative:
measured channel width slightly wider than reference width

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 4 to Trout** Reach # **T4.01** Segment: **0** Completion Date: **August 30, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Paul Stanley** Why Not assessed: Rain: **Yes**

Segment Length (ft): **8,561** Segment Location: **from confluence with Trout to Hutchins Bridge Road.**

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	0

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

1.5 Valley Features

Valley Width (ft): **674**

Width Determination: **Estimated**

Confinement Type: **Very Broad**

Rock Gorge?: **No**

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

Notes:

Upper portion of the Reach (800') dominated by bedrock gorge, and old dam mill (no longer there).
Lower 1/2 of reach slightly more incised (~1.8) than upper portion (~1.5).
Beaver dam being built in middle of reach just downstream of the two small tributaries which feed into reach. Dam not yet complete and not holding back any water at the time of the assessment
historic dredging noted in phase 1, no active dredging observed

Step 2. Stream Channel

2.1 Bankfull Width	40
2.2 Max Depth (ft)	2.80
2.3 Mean Depth (ft)	2.30
2.4 Floodprone Width (ft)	125
2.5 Aband. Floodpln	5.10
2.6 Width/Depth Ratio	17.39
2.7 Entrenchment Ratio	3.13
2.8 Incision Ratio	1.82
2.9 Sinuosity	Moderate
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	250

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	8 %
Coarse Gravel	57 %
Fine Gravel	27 %
Sand	8 %

Silt/Clay Present?	No
Detritus	5 %
# Large Woody	36

2.13 Average Largest Particle on

Bed	50.0	mm
Bar	40.0	mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	143	475
Erosion Height (ft)	5.00	6.00
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	1,080	844

Near Bank Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

Bank Canopy	Left	Right
Canopy %	1-25	1-25

Mid-Channel Canopy: **Open**

3.2 Riparian Buffer

	Left	Right
Buffer Width		
Dominant	5-25	5-25
Sub-dominant	26-50	26-50

Buffer Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Herbaceous	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Hay	Hay
Sub-dominant	Pasture	Pasture

	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	1
Affected Length (ft)	0

Step 5. Channel Bed and Planform Changes

5.1 Bar Types

Mid	Point	Side
3	18	5

Diagonal	Delta	Island
3	1	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: **Yes**

5.5 Straightening: **Yes**

Straightening Length: **1,432**

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: **Unnamed Tributary 4 to Trout** Reach # **T4.01** Segment: **0** Completion Date: **August 30, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Paul Stanley** Rain: **Yes**

Segment Length (ft): **8,561** Segment Location: **from confluence with Trout to Hutchins Bridge Road.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Upstream**	**10.00**	**10.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**20.0**	**No**	**No**	**Yes**	**Yes**

Problem **None**

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**8**	**None**	**Yes**
7.2 Channel Aggradation	**14**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**13**		**No**
Total Score	**47**		
Geomorphic Rating	**0.5875**		

Channel Evolution Model **F**

Channel Evolution Stage **II**

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	**10**
6.3 Velocity/Depth Patterns	**14**
6.4 Sediment Deposition	**10**
6.5 Channel Flow Status	**11**
6.6 Channel Alteration	**9**
6.7 Frequency of Riffles/Steps	**13**
6.8 Bank Stability	**Left: 9 Right: 7**
6.9 Bank Vegetation Protection	**Left: 7 Right: 7**
6.10 Riparian Vegetation Zone Width	**Left: 5 Right: 5**
Total Score	**117**
Habitat Rating	**0.585**

Habitat Stream Condition **Fair**

Narrative:

Historic degradation, historic straightening, lots of rip-rap,

Project: **Trout River Head** | **Phase 2 Segment Summary** page 1 of 2 | March 20, 2007 | **FIT: Yes**

Stream: **Unnamed Tributary 4 to Trout** | Reach # **T4.02** | Segment: **0** | Completion Date: **August 31, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, Sue Brassett** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **4,835** | Segment Location: **From Hutchins Bridge to where valley widens approximately 1 mile upstream.**

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	0

1.4 Adjacent Side	Left	Right
Hillside Slope	**Steep**	**Steep**
Continuous w/	**Sometimes**	**Sometimes**
W/in 1 Bankfull	**Sometimes**	**Sometimes**
Texture	**Bedrock**	**Bedrock**

1.5 Valley Features

Valley Width (ft) **250**

Width Determination **Estimated**

Confinement Type **Narrow**

Rock Gorge? **No**

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

Notes:

5 seperate bedrock grade controls/waterfalls located throughout reach, historic dredging noted on phase 1, but no active dredging observed, reach appeared to be in reference condition, no major adjustments observed

Step 2. Stream Channel

2.1 Bankfull Width	**51**
2.2 Max Depth (ft)	**2.90**
2.3 Mean Depth (ft)	**2.20**
2.4 Floodprone Width (ft)	**75**
2.5 Aband. Floodpln	**2.90**
2.6 Width/Depth Ratio	**23.18**
2.7 Entrenchment Ratio	**1.47**
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	**3** %
Cobble	**57** %
Coarse Gravel	**28** %
Fine Gravel	**11** %
Sand	**1** %

Silt/Clay Present?	**No**
Detritus	**5** %
# Large Woody	**4**

2.13 Average Largest Particle on

Bed	**125.0**	**mm**
Bar	**75.0**	**mm**

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 **Steep**

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

Bank Erosion	Left	Right
Erosion Length (ft)	**0**	**50**
Erosion Height (ft)	**0.00**	**6.00**
Revetmt. Type	**None**	**Rip-Rap**
Revetmt. Length (ft)	**0**	**117**

Near Bank Veg. Type	Left	Right
Dominant	**Coniferous**	**Coniferous**
Sub-dominant	**Shrubs/Saplin**	**Shrubs/Saplin**

Bank Canopy	Left	Right
Canopy %	**51-75**	**51-75**
Mid-Channel Canopy		**Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-dominant	**26-50**	**26-50**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-dominant	**Shrubs/Saplin**	**Shrubs/Saplin**

3.3 Riparian Corridor

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

	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
0	**6**	**8**

Diagonal	Delta	Island
0	**1**	**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 **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: **Unnamed Tributary 4 to Trout** Reach # **T4.02** Segment: **C** Completion Date: **August 31, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Sue Brassett** Rain: **Yes**

Segment Length (ft): **4,835** Segment Location: **From Hutchins Bridge to where valley widens approximately 1 mile upstream.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Upstream**	**6.00**	**4.00**		
Waterfall	**Downstream**	**10.00**	**6.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**15.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above**				
Bridge	**70.0**	**No**	**No**	**No**	**Yes**
Problem	**None**				
Bridge	**60.0**	**Yes**	**Yes**	**No**	**Yes**
Problem	**None**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**16**	**None**	**Yes**
7.2 Channel Aggradation	**18**	**None**	**No**
7.3 Widening Channel	**16**		**No**
7.4 Change in Planform	**19**		**No**
Total Score	**69**		
Geomorphic Rating	**0.8625**		

Channel Evolution Model **F**

Channel Evolution Stage **I**

Geomorphic Condition **Referenc**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**15**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**19**
6.4 Sediment Deposition	**15**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**20**
6.7 Frequency of Riffles/Steps	**18**
6.8 Bank Stability	**Left: 10 Right: 10**
6.9 Bank Vegetation Protection	**Left: 10 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 10**
Total Score	**177**
Habitat Rating	**0.885**

Habitat Stream Condition **Referen**

Narrative:

reach found to be in reference condition, historic dredging noted by VT DEC, though no evidence observed during Phase 2.

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 4 to Trout** Reach # **T4.03** Segment: **0** Completion Date: **September 13, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, P. Stanley** Why Not assessed: Rain: **Yes**

Segment Length (ft): **3,635** Segment Location: **from T4-02 to Sundell Road**

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	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Steep
Continuous w/	Never	Never
W/in 1 Bankfill	Sometimes	Never
Texture	Not Evalua	Not Evalua

1.5 Valley Features

Valley Width (ft): **750**

Width Determination: **Estimated**

Confinement Type: **Very Broad**

Rock Gorge? **No**

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

Notes:

Lots of planform changes from Phase I meander centerline.

Step 2. Stream Channel

2.1 Bankfull Width	48
2.2 Max Depth (ft)	2.90
2.3 Mean Depth (ft)	2.20
2.4 Floodprone Width (ft)	220
2.5 Aband. Floodpln	3.70
2.6 Width/Depth Ratio	21.82
2.7 Entrenchment Ratio	4.58
2.8 Incision Ratio	1.28
2.9 Sinuosity	Low
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	300

2.12 Substrate Composition

Bedrock	0 %
Boulder	0 %
Cobble	24 %
Coarse Gravel	45 %
Fine Gravel	18 %
Sand	13 %

Silt/Clay Present? **No**

Detritus **10** %

Large Woody **2**

2.13 Average Largest Particle on

Bed **100.0** mm

Bar **80.0** mm

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	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	469	417
Erosion Height (ft)	4.00	3.00
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	304	151

Near Bank Veg. Type	Left	Right
Dominant	Herbaceous	Herbaceous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

Bank Canopy	Left	Right
Canopy %	1-25	1-25
Mid-Channel Canopy		Open

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	26-50	5-25
Sub-dominant	5-25	<5

Buffer Veg. Type	Left	Right
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Herbaceous	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Hay	Crop
Sub-dominant	Forest	Hay

	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
0	10	0

Diagonal	Delta	Island
2	1	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.
3	0	No

5.4 Stream Ford or Animal **Yes**

5.5 Straightening **No**

Straightening Length: **0**

5.5 Dredging **Dredging**

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: **Trout River Head** — **Phase 2 Reach Summary**

Stream: **Unnamed Tributary 4 to Trout** Reach # **T4.03** Segment: **0** Completion Date: **September 13, March 20, 2007**

Organization: **Johnson Company** Observers: **Adam Robtoy, P. Stanley** Rain: **Yes**

Segment Length (ft): **3,635** Segment Location: **from T4-02 to Sundell 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?

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**14**	**None**	**Yes**
7.2 Channel Aggradation	**12**	**None**	**No**
7.3 Widening Channel	**12**		**No**
7.4 Change in Planform	**13**		**No**
Total Score	**51**		
Geomorphic Rating	**0.6375**		
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	**8**
6.2 Embeddedness	**10**
6.3 Velocity/Depth Patterns	**14**
6.4 Sediment Deposition	**12**
6.5 Channel Flow Status	**10**
6.6 Channel Alteration	**10**
6.7 Frequency of Riffles/Steps	**16**
6.8 Bank Stability	**Left: 7 Right: 7**
6.9 Bank Vegetation Protection	**Left: 8 Right: 5**
6.10 Riparian Vegetation Zone Width	**Left: 5 Right: 3**
Total Score	**115**
Habitat Rating	**0.575**
Habitat Stream Condition	**Fair**

Narrative:

widening and planform adjustments, meander pattern opposite of Phase I meander centerline pattern

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 4 to Trout** Reach # **T4.04** Segment: **0** Completion Date: **September 13, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Paul Stanley** Why Not assessed: Rain: **Yes**

Segment Length (ft): **4,895** Segment Location: **from Sundell Road to confluences with Pacific Brook**

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	**107**	**0**
Railroads	**0**	**0**
Improved Paths	**0**	**0**
Development	**0**	**0**

1.4 Adjacent Side	Left	Right
Hillside Slope	**Steep**	**Steep**
Continuous w/	**Sometimes**	**Never**
W/in 1 Bankfill	**Sometimes**	**Never**
Texture	**Bedrock**	**Not Evalua**

1.5 Valley Features

Valley Width (ft) **621**

Width Determination **Estimated**

Confinement Type **Very Broad**

Rock Gorge? **No**

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

Notes:

HIstoric straightening.
Bar scalping near South Branch Road Bridge.

Step 2. Stream Channel

2.1 Bankfull Width	**36**
2.2 Max Depth (ft)	**3.00**
2.3 Mean Depth (ft)	**2.40**
2.4 Floodprone Width (ft)	**310**
2.5 Aband. Floodpln	**3.60**
2.6 Width/Depth Ratio	**15.00**
2.7 Entrenchment Ratio	**8.61**
2.8 Incision Ratio	**1.20**
2.9 Sinuosity	**Moderate**
2.10 Riffles Type	**Sedimented**
2.11 Riffle/Step Spacing (ft)	**400**

2.12 Substrate Composition

Bedrock	**0** %
Boulder	**0** %
Cobble	**22** %
Coarse Gravel	**50** %
Fine Gravel	**22** %
Sand	**6** %

Silt/Clay Present?	**No**
Detritus	**10** %
# Large Woody	**8**

2.13 Average Largest Particle on

Bed	**125.0**	**mm**
Bar	**120.0**	**mm**

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	**Gravel**	**Gravel**
Consistency	**Non-cohesive**	**Non-cohesive**
Lower		
Material Type	**Bedrock**	**Gravel**
Consistency	**Cohesive**	**Non-cohesive**

Bank Erosion	Left	Right
Erosion Length (ft)	**0**	**319**
Erosion Height (ft)	**0.00**	**3.33**
Revetmt. Type	**None**	**Rip-Rap**
Revetmt. Length (ft)	**0**	**241**

Near Bank Veg. Type	Left	Right
Dominant	**Shrubs/Saplin**	**Herbaceous**
Sub-dominant	**Deciduous Shrubs/Saplin**	

Bank Canopy	Left	Right
Canopy %	**51-75**	**26-50**
Mid-Channel Canopy	**Open**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-dominant	**26-50**	**<5**

Buffer Veg. Type	Left	Right
Dominant	**Mixed Trees**	**Herbaceous**
Sub-dominant	**Herbaceous**	**Shrubs/Saplin**

3.3 Riparian Corridor

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

	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	**1**
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	**10**	**0**

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

5.2 Other Features

Flood	Neck Cutoff	Avulsion	Braiding
0	**0**	**1**	**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: **669**

5.5 Dredging **Commercial Mining**

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: **Unnamed Tributary 4 to Trout** Reach # **T4.04** Segment: **C** Completion Date: **September 13,**

Organization: **Johnson Company** Observers: **Adam Robtoy, Paul Stanley** Rain: **Yes**

Segment Length (ft): **4,395** Segment Location: **from Sundell Road to confluences with Pacific Brook**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Downstream**	**6.00**	**4.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**25.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above,Deposition Below**				
Bridge	**44.0**	**Yes**	**Yes**	**No**	**Yes**
Problem	**Deposition Above,Deposition Below**				
Bridge	**30.0**	**Yes**	**Yes**	**Yes**	**Yes**
Problem	**Deposition Above**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**16**	**None**	**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**15**		**No**
Total Score	**62**		
Geomorphic Rating	**0.775**		

Channel Evolution Model **F**

Channel Evolution Stage **II**

Geomorphic Condition **Good**

Stream Sensitivity **High**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**12**
6.2 Embeddedness	**10**
6.3 Velocity/Depth Patterns	**12**
6.4 Sediment Deposition	**10**
6.5 Channel Flow Status	**13**
6.6 Channel Alteration	**14**
6.7 Frequency of Riffles/Steps	**13**
6.8 Bank Stability	**Left: 10 Right: 7**
6.9 Bank Vegetation Protection	**Left: 10 Right: 6**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 5**
Total Score	**132**
Habitat Rating	**0.66**

Habitat Stream Condition **Good**

Narrative:

Minor historic degradation, widening and planform

Project: **Trout River Head** | **Phase 2 Segment Summary** | | March 20, 2007 | **FIT: Yes**

Stream: **Unnamed Tributary 5 to Trout** | Reach # **T5.01** | Segment: **0** | Completion Date: **August 23, 2006**

Organization: **Johnson Company** | Observers: **Adam Robtoy, J.P.R.** | Why Not assessed: | Rain: **Yes**

Segment Length (ft): **2,419** | Segment Location: **From confluence with Trout River to confluence with 1st major tributary.**

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	0

1.4 Adjacent Side

	Left	Right
Hillside Slope	Extremely	Extremely
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Always	Always
Texture	Bedrock	Bedrock

1.5 Valley Features

Valley Width (ft): **50**

Width Determination: **Measured**

Confinement Type: **Narrowly**

Rock Gorge?: **No**

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

Notes:

Old concrete dam remnents located mid-reach. Dam does not span channel and remnents were only on left bank.
Upper 300ft of Reach slightly less steep with smaller steps (B Type)- Not segmented due to very short length, should be assessed with T5-02. Remainder of reach more like A type with steeper steps/pools and narrow valley.

Step 2. Stream Channel

2.1 Bankfull Width	28
2.2 Max Depth (ft)	3.00
2.3 Mean Depth (ft)	2.00
2.4 Floodprone Width (ft)	40
2.5 Aband. Floodpln	3.00
2.6 Width/Depth Ratio	14.00
2.7 Entrenchment Ratio	1.43
2.8 Incision Ratio	1.00
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	70

2.12 Substrate Composition

Bedrock	16 %
Boulder	33 %
Cobble	32 %
Coarse Gravel	14 %
Fine Gravel	5 %
Sand	0 %

Silt/Clay Present?	No
Detritus	0 %
# Large Woody	25

2.13 Average Largest Particle on

Bed	250.0	mm
Bar	150.0	mm

2.14 Stream Type

Stream Type: **A**

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: **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	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	Deciduous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-Channel Canopy		Open

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	26-50	5-25
Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Herbaceous	Herbaceous

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	Forest	Forest
Sub-dominant	Hay	Hay

	Amount	Mean Height
Mass Failures	One	40.00
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	1
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	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: **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: **Unnamed Tributary 5 to Trout** Reach # **T5.01** Segment: **0** Completion Date: **August 23, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, J.P.R.** Rain: **Yes**

Segment Length (ft): **2,419** Segment Location: **From confluence with Trout River to confluence with 1st major tributary.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Ledge	**Downstream**	**5.00**	**3.00**		
Ledge	**Downstream**	**5.00**	**3.00**		
Waterfall	**Downstream**	**8.00**	**7.00**		
Waterfall	**Mid-Segment**	**8.00**	**7.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**15.0**	**Yes**	**No**	**Yes**	**Yes**

Problem **None**

Narrative:
Minor Widening

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**17**	**None**	**No**
7.2 Channel Aggradation	**17**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**19**		**No**
Total Score	**68**		
Geomorphic Rating	**0.85**		

Channel Evolution Model **F**
Channel Evolution Stage **I**
Geomorphic Condition **Referenc**
Stream Sensitivity **Low**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**18**
6.2 Embeddedness	**16**
6.3 Velocity/Depth Patterns	**17**
6.4 Sediment Deposition	**16**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**19**
6.7 Frequency of Riffles/Steps	**18**
6.8 Bank Stability	**Left: 8 Right: 10**
6.9 Bank Vegetation Protection	**Left: 9 Right: 9**
6.10 Riparian Vegetation Zone Width	**Left: 9 Right: 9**
Total Score	**173**
Habitat Rating	**0.865**

Habitat Stream Condition **Referen**

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 6 to Trout** Reach # **T6.01** Segment: **0** Completion Date: **August 29, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, D.B.** Why Not assessed: Rain: **Yes**

Segment Length (ft): **2,701** Segment Location: **From confluence with Wade Brook to 1st major tributary ~ 1/2 mile upstream.**

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	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfull	Sometimes	Sometimes
Texture	Bedrock	Other

1.5 Valley Features

Valley Width (ft)	200
Width Determination	Measured
Confinement Type	Narrow
Rock Gorge?	No

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

Notes:

historic dredging noted in phase 1, no active dredging observed, no major adjustments observed except for minor historic degradation and two islands with split flows on either side, no encroachments

Step 2. Stream Channel

2.1 Bankfull Width	43
2.2 Max Depth (ft)	3.20
2.3 Mean Depth (ft)	2.30
2.4 Floodprone Width (ft)	84
2.5 Aband. Floodpln	5.00
2.6 Width/Depth Ratio	18.70
2.7 Entrenchment Ratio	1.95
2.8 Incision Ratio	1.56
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	200

2.12 Substrate Composition

Bedrock	0 %
Boulder	8 %
Cobble	56 %
Coarse Gravel	22 %
Fine Gravel	8 %
Sand	6 %

Silt/Clay Present?	Yes
Detritus	0 %
# Large Woody	17

2.13 Average Largest Particle on

Bed	250.0	mm
Bar	180.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Mix
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	234	34
Erosion Height (ft)	6.50	7.00
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0

Near Bank Veg. Type	Left	Right
Dominant	Deciduous	Deciduous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

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

Mid-Channel Canopy **Open**

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	None	26-50
Buffer Veg. Type	Left	Right
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

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	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	5	10

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	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: **Unnamed Tributary 6 to Trout** Reach # **T6.01** Segment: **C** Completion Date: **August 29, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, D.B.** Rain: **Yes**

Segment Length (ft): **2,701** Segment Location: **From confluence with Wade Brook to 1st major tributary ~ 1/2 mile upstream.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Mid-Segment**	**5.00**	**2.00**		

4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Unconfined**

	Score	STD	Historic
7.1 Channel Degradation	**15**	**None**	**Yes**
7.2 Channel Aggradation	**16**	**None**	**No**
7.3 Widening Channel	**15**		**No**
7.4 Change in Planform	**17**		**No**
Total Score	**63**		
Geomorphic Rating	**0.7875**		

Channel Evolution Model **F**

Channel Evolution Stage **III**

Geomorphic Condition **Good**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**16**
6.2 Embeddedness	**16**
6.3 Velocity/Depth Patterns	**16**
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: 8 Right: 9**
6.9 Bank Vegetation Protection	**Left: 10 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 10**
Total Score	**165**
Habitat Rating	**0.825**

Habitat Stream Condition **Good**

Narrative:

Minor widening and historic degradation. historic dredging from phase 1, no active dredging observed, minor bank erosion at a few spots, but no major problem areas noted

Project: **Trout River Head**

Phase 2 Segment Summary

March 20, 2007 **FIT: Yes**

Stream: **Unnamed Tributary 7 to Trout** Reach # **T7.01** Segment: **0** Completion Date: **September 14, 2006**

Organization: **Johnson Company** Observers: **Adam Robtoy, Brian Lerich** Why Not assessed: Rain: **Yes**

Segment Length (ft): **10,973** Segment Location: **from confluence with Jay Brook to just upstream of Amadon Road Bridge**

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	0

1.4 Adjacent Side	Left	Right
Hillside Slope	Very Steep	Very Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfull	Sometimes	Sometimes
Texture	Bedrock	Bedrock

1.5 Valley Features

Valley Width (ft) **150**

Width Determination **Measured**

Confinement Type **Semi-confined**

Rock Gorge? **No**

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

Notes:

reach appears to be reference B-type stream, no encroachments or major conflict areas noted,

Step 2. Stream Channel

2.1 Bankfull Width	39
2.2 Max Depth (ft)	3.10
2.3 Mean Depth (ft)	2.50
2.4 Floodprone Width (ft)	66
2.5 Aband. Floodpln	3.10
2.6 Width/Depth Ratio	15.60
2.7 Entrenchment Ratio	1.69
2.8 Incision Ratio	1.00
2.9 Sinuosity	Moderate
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	150

2.12 Substrate Composition

Bedrock	0 %
Boulder	7 %
Cobble	51 %
Coarse Gravel	30 %
Fine Gravel	7 %
Sand	5 %

Silt/Clay Present?	No
Detritus	10 %
# Large Woody	57

2.13 Average Largest Particle on

Bed	230.0	mm
Bar	175.0	mm

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 **Steep**

Bank Texture	Left	Right
Upper		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	40	0
Erosion Height (ft)	6.00	0.00
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0

Near Bank Veg. Type	Left	Right
Dominant	Coniferous	Coniferous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

Bank Canopy	Left	Right
Canopy %	51-75	51-75
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	Mixed Trees	Mixed Trees
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin

3.3 Riparian Corridor

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

	Amount	Mean Height
Mass Failures	Multiple	28.50
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
2	11	5
Diagonal	**Delta**	**Island**
0	2	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 **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: **Unnamed Tributary 7 to Trout** Reach # **T7.01** Segment: **0** Completion Date: **September 14,**

Organization: **Johnson Company** Observers: **Adam Robtoy, Brian Lerich** Rain: **Yes**

Segment Length (ft): **10,973** Segment Location: **from confluence with Jay Brook to just upstream of Amadon Road Bridge**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water	Photo Taken	GPSTaken
Waterfall	**Downstream**	**8.00**	**5.00**		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bedrock	**25.0**	**No**	**No**	**Yes**	**Yes**
Problem	**None**				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**17**	**None**	**No**
7.2 Channel Aggradation	**19**	**None**	**No**
7.3 Widening Channel	**16**		**No**
7.4 Change in Planform	**20**		**No**
Total Score	**72**		
Geomorphic Rating	**0.9**		

Channel Evolution Model **F**

Channel Evolution Stage **I**

Geomorphic Condition **Referenc**

Stream Sensitivity **Moderate**

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	**17**
6.2 Embeddedness	**15**
6.3 Velocity/Depth Patterns	**17**
6.4 Sediment Deposition	**18**
6.5 Channel Flow Status	**15**
6.6 Channel Alteration	**20**
6.7 Frequency of Riffles/Steps	**19**
6.8 Bank Stability	**Left: 9 Right: 9**
6.9 Bank Vegetation Protection	**Left: 10 Right: 10**
6.10 Riparian Vegetation Zone Width	**Left: 10 Right: 10**
Total Score	**179**
Habitat Rating	**0.895**

Habitat Stream Condition **Referen**

Narrative:

no major adjustments noted, reach found to be in reference condition

Stream Geomorphic Assessment

VT DEC

Culvert Summary Report

General Information

VTrans Structure ID	vtrans-700011022506033	**Local Structure ID**	---
Assessment Date	09/20/2006	**Observers**	Adam Robtoy, Staci Po
Town	Berkshire		
Location	---		
Latitude	44.93	**Longitude**	-72.70
Road Name	WOODWARD NEIGHBORHODD RD	**Road Type**	Gravel
Stream Name	Unamed Tributary		
Channel width	14 ft. (Curve)	**High flow stage**	No

Culvert Information

Material	Steel Corrugated	**Number of culverts**	1
Culvert Length	45 ft.	**Skewed to roadway?**	No
Culvert Height	72 inches (6.0 ft.)	**Culvert Overflow Pipe**	No
Culvert Width	108 inches (9.0 ft.)		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Culvert slope as compared with channel slope is significantly	Same
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Sharp Bend
Culvert outlet invert	Cascade
Outlet drop (invert to water surface)	0.7 ft.
Water depth in culvert (at outlet)	0.1 ft.
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	Yes

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	None
Bedrock Present	No	No	
Material Present throughout			No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	Yes	Yes	No
Bank Erosion	None	High	
Hard Bank Armoring	Intact	Failing	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Herbaceous/Grass	
Dominant Vegetation Type - Right	Herbaceous/Grass	Herbaceous/Grass	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information

Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

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Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700011022206033	**Local Structure ID**	---
Assessment Date	07/06/2006	**Observers**	Adam Robtoy, Staci Po
Town	Berkshire		
Location	---		
Latitude	44.93	**Longitude**	-72.69
Road Name	Route 118	**Road Type**	Paved
Stream Name	Trout River		
Channel width	117 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	0
Bridge Width	33 ft.	**Skewed to roadway?**	No
Bridge Clearance	16 ft.		
Bridge/Arch Span	144 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	Yes	No
Bank Erosion	None	Low	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Herbaceous/Grass	
Dominant Vegetation Type - Right	Herbaceous/Grass	Herbaceous/Grass	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Pilon showing on upper stream right side.		

Stream Geomorphic Assessment

VT DEC

Arch Summary Report

General Information

VTrans Structure ID	vtrans-700011022606033	**Local Structure ID**	---
Assessment Date	09/20/2006	**Observers**	Adam Robtoy, Staci Po
Town	Berkshire		
Location	---		
Latitude	44.93	**Longitude**	-72.70
Road Name	Route 118	**Road Type**	Paved
Stream Name	M1S1.01		
Channel width	11 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Concrete	**Number of bridge piers/arches**	0
Bridge Width	50 ft.	**Skewed to roadway?**	No
Bridge Clearance	5 ft.		
Bridge/Arch Span	11 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Partially
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	No
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Road Embankment	Bare	
Dominant Vegetation Type - Right	Road Embankment	Bare	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700002003206103	**Local Structure ID**	---
Assessment Date	08/30/2006	**Observers**	Adam Robtoy, Staci Po
Town	Montgomery		
Location	Farm Bridge T4-01		
Latitude	44.88	**Longitude**	-72.61
Road Name	---	**Road Type**	Gravel
Stream Name	South Branch		
Channel width	40 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	0
Bridge Width	16 ft.	**Skewed to roadway?**	No
Bridge Clearance	10 ft.		
Bridge/Arch Span	40 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	Yes	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Bare	
Dominant Vegetation Type - Right	Herbaceous/Grass	Bare	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Arch Summary Report

General Information

VTrans Structure ID	vtrans-700019027206103	**Local Structure ID**	---
Assessment Date	09/14/2006	**Observers**	Adam Robtoy, B. Lerich
Town	Montgomery		
Location	upstream end of T7-01		
Latitude	44.87	**Longitude**	-72.55
Road Name	AMIDON RD	**Road Type**	Gravel
Stream Name	Wade Brook		
Channel width	20 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	0
Bridge Width	100 ft.	**Skewed to roadway?**	Yes
Bridge Clearance	17 ft.		
Bridge/Arch Span	24 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	Yes

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Cobble	Cobble	Cobble
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	Yes	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Coniferous Forest	Coniferous Forest	
Dominant Vegetation Type - Right	Coniferous Forest	Herbaceous/Grass	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	Yes	
Vegetation Band - Right	Yes	Yes	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	1989 construction date		

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Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700001001706103	**Local Structure ID**	---
Assessment Date	08/01/2006	**Observers**	Adam Robtoy, JPR
Town	Montgomery		
Location	Black Falls Road- T3-01 - T3-02		
Latitude	44.91	**Longitude**	-72.63
Road Name	BLACK FALLS RD	**Road Type**	Gravel
Stream Name	Black Falls Brook		
Channel width	32 ft. (Measured)	**High flow stage**	Yes

Bridge/Arch Information

Material	Concrete	**Number of bridge piers/arches**	0
Bridge Width	38 ft.	**Skewed to roadway?**	Yes
Bridge Clearance	9 ft.		
Bridge/Arch Span	51 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Partially
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Cobble	Cobble	Cobble
Bedrock Present	Yes	Yes	Yes
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	Yes
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Herbaceous/Grass	
Dominant Vegetation Type - Right	Herbaceous/Grass	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	No	
Vegetation Band - Right	Yes	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Newer Bridge- Old rock abutment still in place upstream.		

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Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700001001606103	**Local Structure ID**	---
Assessment Date	08/24/2006	**Observers**	Adam Robtoy, E. Crand
Town	Montgomery		
Location	---		
Latitude	44.90	**Longitude**	-72.64
Road Name	COMSTOCK BRIDGE RD	**Road Type**	Paved
Stream Name	Trout River		
Channel width	38 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Timber	**Number of bridge piers/arches**	0
Bridge Width	20 ft.	**Skewed to roadway?**	Yes
Bridge Clearance	18 ft.		
Bridge/Arch Span	38 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Sharp Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	Yes

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Sand	Sand	Sand
Bedrock Present	Yes	No	Yes
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Shrub/Sapling	Herbaceous/Grass	
Dominant Vegetation Type - Right	Shrub/Sapling	Herbaceous/Grass	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-990001001506103	**Local Structure ID**	---
Assessment Date	08/01/2006	**Observers**	Adam Robtoy
Town	Montgomery		
Location	Covered Bridge- Fuller Bridge/Brook Road		
Latitude	44.90	**Longitude**	-72.64
Road Name	FULLER BRIDGE RD	**Road Type**	Paved
Stream Name	Black Falls Brook		
Channel width	36 ft. (Measured)	**High flow stage**	Yes

Bridge/Arch Information

Material	Timber	**Number of bridge piers/arches**	0
Bridge Width	20 ft.	**Skewed to roadway?**	No
Bridge Clearance	8 ft.		
Bridge/Arch Span	36 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Channelized Straight
Pool present immediately downstream of structure	No
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Cobble	Cobble	Cobble
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Road Embankment	Road Embankment	
Dominant Vegetation Type - Right	Herbaceous/Grass	Road Embankment	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700043029406103	**Local Structure ID**	---
Assessment Date	08/31/2006	**Observers**	Adam Robtoy, Sue Bros
Town	Montgomery		
Location	Gibou Road		
Latitude	44.85	**Longitude**	-72.61
Road Name	GIBOU RD	**Road Type**	Gravel
Stream Name	South Branch/Trout River		
Channel width	40 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Concrete	**Number of bridge piers/arches**	0
Bridge Width	30 ft.	**Skewed to roadway?**	No
Bridge Clearance	50 ft.		
Bridge/Arch Span	70 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Bedrock	Bedrock	Bedrock
Bedrock Present	Yes	Yes	Yes
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Road Embankment	Shrub/Sapling	
Dominant Vegetation Type - Right	Shrub/Sapling	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	Yes	
Vegetation Band - Right	Yes	Yes	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Newer Bridge-old abutment from previous covered bridge still in place just upstream.		

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Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700043039806103	**Local Structure ID**	---
Assessment Date	08/31/2006	**Observers**	Adam Robtoy, Sue Bros
Town	Montgomery		
Location	Hutchins Bridge		
Latitude	44.86	**Longitude**	-72.61
Road Name	HUTCHINS BRIDGE RD	**Road Type**	Paved
Stream Name	South Branch/Trout River		
Channel width	40 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Timber	**Number of bridge piers/arches**	0
Bridge Width	20 ft.	**Skewed to roadway?**	No
Bridge Clearance	21 ft.		
Bridge/Arch Span	60 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Sharp Bend
Pool present immediately downstream of structure	No
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Bedrock	Bedrock	Bedrock
Bedrock Present	Yes	Yes	Yes
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Mixed Forest	Mixed Forest	
Dominant Vegetation Type - Right	Mixed Forest	Mixed Forest	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	Yes	
Vegetation Band - Right	Yes	Yes	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Culvert Summary Report

General Information

VTrans Structure ID	vtrans-700004009006103	**Local Structure ID**	---
Assessment Date	09/20/2006	**Observers**	Adam Robtoy, Paul Sta
Town	Montgomery		
Location	---		
Latitude	44.91	**Longitude**	-72.67
Road Name	LONGLEY BRIDGE RD	**Road Type**	Gravel
Stream Name	Unamed Tributary		
Channel width	15 ft. (Measured)	**High flow stage**	No

Culvert Information

Material	Concrete	**Number of culverts**	0
Culvert Length	42 ft.	**Skewed to roadway?**	No
Culvert Height	84 inches (7.0 ft.)	**Culvert Overflow Pipe**	No
Culvert Width	84 inches (7.0 ft.)		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Culvert slope as compared with channel slope is significantly	Lower
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Culvert outlet invert	Free Fall
Outlet drop (invert to water surface)	1.2 ft.
Water depth in culvert (at outlet)	0.1 ft.
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Cobble	Cobble	None
Bedrock Present	No	No	
Material Present throughout			No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Road Embankment	Road Embankment	
Dominant Vegetation Type - Right	Road Embankment	Road Embankment	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	No	
Vegetation Band - Right	Yes	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information

Spatial location data collected with GPS?	Yes	Photos taken?	Yes
Comments	New in 1998		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-990001000510101	**Local Structure ID**	---
Assessment Date	08/18/2006	**Observers**	Adam Robtoy, E. Crand
Town	Montgomery		
Location	Longley Bridge Road		
Latitude	44.91	**Longitude**	-72.02
Road Name	LONGLEY BRIDGE RD	**Road Type**	Gravel
Stream Name	Trout River		
Channel width	90 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Timber	**Number of bridge piers/arches**	0
Bridge Width	20 ft.	**Skewed to roadway?**	No
Bridge Clearance	24 ft.		
Bridge/Arch Span	90 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	Yes	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Shrub/Sapling	
Dominant Vegetation Type - Right	Herbaceous/Grass	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	Yes	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700008016406103	**Local Structure ID**	---
Assessment Date	09/13/2006	**Observers**	Adam Robtoy, Staci Po
Town	Montgomery		
Location	South Branch Road T4-04		
Latitude	44.84	**Longitude**	-72.61
Road Name	S BRANCH RD	**Road Type**	Gravel
Stream Name	South Branch/Trout River		
Channel width	38 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	0
Bridge Width	10 ft.	**Skewed to roadway?**	No
Bridge Clearance	7 ft.		
Bridge/Arch Span	44 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Not Significant
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Sharp Bend
Pool present immediately downstream of structure	No
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	None	None	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Shrub/Sapling	Bare	
Dominant Vegetation Type - Right	Shrub/Sapling	Mixed Forest	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Bridge abutment on right recently repaired. Lots of gravel manipulation upstream, downstream and in-		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700006009906103	**Local Structure ID**	---
Assessment Date	08/24/2006	**Observers**	Adam Robtoy, E. Crand
Town	Montgomery		
Location	---		
Latitude	44.90	**Longitude**	-72.63
Road Name	VINCENTS BRIDGE RD	**Road Type**	Gravel
Stream Name	Trout River		
Channel width	74 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	0
Bridge Width	15 ft.	**Skewed to roadway?**	Yes
Bridge Clearance	22 ft.		
Bridge/Arch Span	82 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	Low	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Shrub/Sapling	Shrub/Sapling	
Dominant Vegetation Type - Right	Shrub/Sapling	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	Yes	
Vegetation Band - Right	No	Yes	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Barscalping on mid-channel bar downstream of bridge.		

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Stream Geomorphic Assessment

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Culvert Summary Report

General Information

VTrans Structure ID	vtrans-700028033106033	**Local Structure ID**	---
Assessment Date	09/21/2006	**Observers**	Adam Robtoy, Paul Sta
Town	Montgomery		
Location	Demming Road		
Latitude	44.90	**Longitude**	-72.68
Road Name	Demming Road	**Road Type**	Gravel
Stream Name	Unamed Tributary		
Channel width	17 ft. (Measured)	**High flow stage**	No

Culvert Information

Material	Steel Corrugated	**Number of culverts**	1
Culvert Length	40 ft.	**Skewed to roadway?**	No
Culvert Height	60 inches (5.0 ft.)	**Culvert Overflow Pipe**	No
Culvert Width	60 inches (5.0 ft.)		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Culvert slope as compared with channel slope is significantly	Same
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Naturally Straight
Culvert outlet invert	Free Fall
Outlet drop (invert to water surface)	7.0 ft.
Water depth in culvert (at outlet)	0.2 ft.
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	Yes

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Cobble	Gravel	None
Bedrock Present	No	No	
Material Present throughout			No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	High	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Shrub/Sapling	Shrub/Sapling	
Dominant Vegetation Type - Right	Shrub/Sapling	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	Yes	
Vegetation Band - Right	Yes	Yes	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information

Spatial location data collected with GPS?	Yes	Photos taken?	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-100603005206031	**Local Structure ID**	---
Assessment Date	07/06/2006	**Observers**	Adam Robtoy, Noelia B
Town	Montgomery		
Location	Hopkins Bridge Road		
Latitude	44.92	**Longitude**	-72.67
Road Name	Hopkins Bridge Road	**Road Type**	Gravel
Stream Name	Trout River		
Channel width	73 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Timber	**Number of bridge piers/arches**	0
Bridge Width	23 ft.	**Skewed to roadway?**	No
Bridge Clearance	13 ft.		
Bridge/Arch Span	73 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Partially
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Channelized Straight
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Shrub/Sapling	Shrub/Sapling	
Dominant Vegetation Type - Right	Shrub/Sapling	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	---		

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Stream Geomorphic Assessment

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Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700001002406103	**Local Structure ID**	---
Assessment Date	08/18/2006	**Observers**	Adam Robtoy
Town	Montgomery		
Location	Rt. 118 Just west of Hill West Rd.		
Latitude	44.90	**Longitude**	-72.65
Road Name	Route 118	**Road Type**	Paved
Stream Name	Trout River		
Channel width	110 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	2
Bridge Width	30 ft.	**Skewed to roadway?**	No
Bridge Clearance	20 ft.		
Bridge/Arch Span	160 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Channelized Straight
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	Yes
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	Yes	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Herbaceous/Grass	
Dominant Vegetation Type - Right	Herbaceous/Grass	Herbaceous/Grass	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	Yes	No	
Vegetation Band - Right	Yes	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Bridge under construction.		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700002003506103	**Local Structure ID**	---
Assessment Date	08/16/2006	**Observers**	Adam Robtoy, Evan Cr
Town	Montgomery		
Location	Route 118		
Latitude	44.88	**Longitude**	-72.61
Road Name	Route 118	**Road Type**	Paved
Stream Name	Trout River		
Channel width	50 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Concrete	**Number of bridge piers/arches**	0
Bridge Width	30 ft.	**Skewed to roadway?**	No
Bridge Clearance	14 ft.		
Bridge/Arch Span	52 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Entirely
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	No
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	No
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Cobble	Cobble	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Road Embankment	Road Embankment	
Dominant Vegetation Type - Right	Road Embankment	Road Embankment	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	Photos taken?	Yes
Comments	---		

Stream Geomorphic Assessment

VT DEC

Bridge Summary Report

General Information

VTrans Structure ID	vtrans-700012020606103	**Local Structure ID**	---
Assessment Date	09/14/2006	**Observers**	Adam Robtoy
Town	Montgomery		
Location	Route 118 Near West Hill Road		
Latitude	44.90	**Longitude**	-72.65
Road Name	Route 118	**Road Type**	Paved
Stream Name	Trout River- West Hill Brook		
Channel width	40 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Concrete	**Number of bridge piers/arches**	2
Bridge Width	42 ft.	**Skewed to roadway?**	No
Bridge Clearance	5 ft.		
Bridge/Arch Span	130 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Partially
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Mild Bend
Pool present immediately downstream of structure	No
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	Yes	Yes
Bank Erosion	None	Low	
Hard Bank Armoring	Intact	None	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Shrub/Sapling	Shrub/Sapling	
Dominant Vegetation Type - Right	Shrub/Sapling	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	**Photos taken?**	Yes
Comments	Bridge clogged with sediment.		

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Stream Geomorphic Assessment

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Bridge Summary Report

General Information

VTrans Structure ID	vtrans-990042039606103	**Local Structure ID**	---
Assessment Date	08/24/2006	**Observers**	Adam Robtoy, E. Crand
Town	Montgomery		
Location	Route 118 Start of Reach M03		
Latitude	44.90	**Longitude**	-72.65
Road Name	Route 118	**Road Type**	Paved
Stream Name	Trout River		
Channel width	115 ft. (Measured)	**High flow stage**	No

Bridge/Arch Information

Material	Steel	**Number of bridge piers/arches**	2
Bridge Width	30 ft.	**Skewed to roadway?**	No
Bridge Clearance	9 ft.		
Bridge/Arch Span	125 ft.		

Geomorphic Information

Floodplain filled by roadway approaches	Partially
Structure is located at significant break in valley slope	No
Obstructions at the opening of the structure	---
Steep riffle present immediately upstream of structure	Yes
If channel avulses, stream will	Cross Road
Estimated distance avulsion would follow road	--- ft.
Angle of stream flow approaching structure	Channelized Straight
Pool present immediately downstream of structure	Yes
Downstream bank heights are substantially higher than upstream bank heights	No
Stepped footers	No

More Geomorphic Information

	Upstream	Downstream	In Structure
Dominant Bed Material	Gravel	Gravel	Gravel
Bedrock Present	No	No	No
Type of Sediment Deposits	---	---	---
Elevation of sediment deposits greater than 1/2 bankfull	No	No	No
Bank Erosion	None	None	
Hard Bank Armoring	Intact	Intact	
Stream bed scour causing undermining around or under structure	---	---	
Beaver Dam near Structure	No	No	
Beaver Dam distance (ft.)	---	---	

Vegetation

	Upstream	Downstream	In Structure
Dominant Vegetation Type - Left	Herbaceous/Grass	Herbaceous/Grass	
Dominant Vegetation Type - Right	Herbaceous/Grass	Shrub/Sapling	
Does a band of shrub/forest vegetation 50 ft. wide start within 25 ft. of the structure and extend at least 500 ft. up/downstream?			
Vegetation Band - Left	No	No	
Vegetation Band - Right	No	No	

Wildlife

	Roadkill	Outside Structure	Inside Structure
Species	---	---	---

Other Information			
Spatial location data collected with GPS?	Yes	Photos taken?	Yes
Comments	---		

APPENDIX B

DATA QUALITY ASSURANCE SUMMARY REPORT

March 21, 2007

QA Notes For: **Trout River Mouth and Head**
Data checked by Jared Carrano

The review of the Trout River data was done by Jared Carrano and reviewed by Staci Pomeroy. Data from both Phase 1 and Phase 2 was reviewed. The DMS and ArcView projects were also used to help support review of data. Information from both phases was used to help look at what may be occurring on the reach/segment as noted in the Phase 2 information. Overall the Trout River Phase 2 data seemed well done.

Listed below are comments and the general types of errors/questions for particular steps and then those specific to a reach. These comments and questions are intended to: help insure that the data is as accurate as possible, allow for further explanation by the consultant who collected the data, point out areas where there may be issues that need to be addressed and/or recognized in using the data, and help document things that came up as data was reviewed. After review of the information noted, the consultant should update the document with what steps, if any, were taken to address the comments/questions. The consultant comments/updates were done by Adam Robtoy of The Johnson Company between 2-23-07 and 2-28-07.

General:

1) Part of a phase2 evaluation is to verify or update phase1 information. It is very important that you take the phase1 report with you into the field and check if its data is accurate. Some phase1 fields will get updated automatically, but others need to be edited manually. These include **phase1 steps 2.10 (confinement type), 4.3 (riparian buffer), and 6.3 (channel bars)**. It is also important to update those fields that, for one reason or another, weren't ever completed in phase1. After phase2 is completed, you should be able to update certain phase1 fields that are either blank or were entered as "No Data". Phase1 steps common to this project are **2.12 (bedform), 5.1 (flow regulations), and 7.1 (sub-class slope)**. All reaches have at least some data that can be updated. Please go through this project and make any relevant updates. Relevant portions of the Phase 1 have been updated.

2) There is currently a bug in the FIT upload that does not allow for the automatic update of phase1 5.5 (dredging history) with the data indexed with FIT. In this case the bug was actually helpful in finding a significant oversight in your data. The dredging parameter is not only meant to capture current dredging, but also any historic activity. This might come from local knowledge or contact with River Management personnel. In this project, phase1 shows that there was indeed historic dredging on multiple reaches. Your phase2 data does not account for this. Had this bug not been present, all phase1 dredging data would have been lost when you uploaded FIT. This is why it is crucial that you carefully field check phase1 data in the field.

Trout Mouth - see Reaches: **M01, M02, M1S1.01, and T2.01**.
Trout Head – see Reaches: **M04, M05, T3.01, T4.01, T4.02 and T6.01**

This information of historic dredging data will potentially affect some of the RGA scores. Please review the RGA data after reviewing the reach information to confirm that the RGA reflects the impact correctly. The RGAs and reach comments have been adjusted to reflect these changes.

3) It is important to provide detailed comments for each reach. A narrative that both supports the data and describes those things that the data does not capture is helpful for others trying to picture conditions on the reach. It is also important to describe the bankfull indicators used to establish bankfull. Similarly, the Narrative section of the RGA is meant as a way to support in words the RGA scores given for a reach. The comments you do provide are helpful, however, some are altogether missing. This portion of the evaluation is best to fill out soon after walking the reach, so that it is fresh in your mind.

Trout Mouth - See reaches: **M2S3.01 and T1.02.**

Trout Head – See reaches: **M05, T3.02, T4.02, T6.01 and T7.01**

Comments have been added for these reaches.

4) Phase1 Steps 6.5 and 6.6: These steps should be entered as "not applicable" for A and B stream types. While these are typically captured during Phase 1, they were missed on some reaches. If the stream is an E or C, you do not have to calculate these, but you should note in your report that this info is missing and needs to be updated in the future.

Trout Mouth – See reaches: **M1S1.01, M2S3.01, M2S3.02 and T1.02**

Trout Head – see reaches: **T3.01, T3.02, T5.01, T6.01 and T7.01**

The Phase 1 data has been updated for these reaches.

5) Bridge and Culvert data is updated with FIT in phase1 – step 5.2, but must be manually entered in phase2 – step 4.8. Some reaches have conflicting data.

Trout Mouth – See reaches: **M01, M02 and T2.01 - (P1 = 2, P2 =1)**

Trout Head – See reaches: **M03 (P1 = 3, P2 =1), M04 (P1 =2, P2 = 1), T4.02 (P1 = 2, P2 =0) and T4.04 (P1 = 2, P2 =1)**

The DMS has been updated for these reaches. The phase 2 data for T2.01 is correct, the reach only has 1 bridge/culvert but the Phase 1 still says 2 even after uploading the FIT. Thank you for this note, it will help with data review; I will look at the FIT files and let the IT know that there may be a bug in the upload.

Trout Mouth Reaches:

M01 You note in your comments that there is "minor bar scalping" yet you have not indexed this with FIT. Please update the FIT file and DMS with this information. FIT and DMS updated on 2-23-07.

M1S1.01

- The confinement types between the phases does not match; Phase 1 = narrow, Phase 2 = broad. When a channel has significantly over-widened, you are supposed to calculate the confinement ratio using the phase1, or "reference" channel width (see protocols). Since phase1 is using 13' and phase2 is using 20' you are getting different confinement values. If 20' is the "reference" width (ie. no widening has occurred yet) than you must update both the phase1 channel width and the phase1 confinement type. If 20' is the over-widened width, you should use the phase1 width to determine confinement.

The Phase 1 and 2 confinement was updated on 2-23-07 using the Phase 1 channel width of 13'. Both valley widths have been changed to very broad (valley = 180', channel = 13').

- Phase1 step 6.4: Meander migration says "Avulsion" but there are no avulsions noted in phase2. Please confirm that there is no avulsion and update phase1 to appropriate migration pattern.

No avulsions were noted during the Phase 2 assessment so the phase 1 has been updated to none.

- The channel evolution stage is noted as 2 – with some of the widening that is noted, do you think this may have or is moving into stage 3? I agree, the evolution stage was updated to III on 2-23-07.

M2S3.01 - The incision ratio, 1.65, seems high for a reach in "good" condition. This is a "Ba" stream, and "recently abandon floodplains" may be difficult to determine in the field. The cross-section sheet downloaded from the DMS, does not have a "bench" feature at the "abandoned floodplain" elevation, simply a point. This reach also has a "very broad" valley with a >4% slope. In looking at the topo and reach breaks it appears that there is a steeper portion of the reach that was lumped in with an area that comes into the broader valley. Should this reach have been segmented? Are the slope and valley type appropriate for the entire reach? Does the incision ratio represent the lower portion of the reach or the upper? After reviewing this reach, the stream type has been updated to B3 with no subclass slope. Step 7.1 has been updated to reflect the incision (score changed from 16 to 12). After looking at the cross section data and photos, I think the incision ratio is correct and the reach has undergone some historic degradation. The cross section was taken about halfway between the culvert located in the upper portion of the reach and the downstream end of the reach and is representative of this portion. The upper ~300' above the culvert is steeper and similar to M2S3.02 and should probably be included with this reach. No segmentation was done because this upstream portion was so short. I have added a comment in the DMS to reflect this. Good documentation.

M2S3.02

- In this case, you correctly calculate the confinement type in phase2. However, the point of the QC Check is to point out that you need to update phase1 when the Phase 2 data is more accurate. Phase 1 valley width updated on 2-23-07 to SC.
- Phase1 Step 4.4: Ground water inputs in phase1 are "abundant" while phase2 says that there are "some" springs and seeps, and no wetlands. Does this make sense? Or should phase1 be updated to "some"? The phase 1 has been left as abundant as the choices are either abundant, minimal or none. I think abundant is more appropriate in this case than minimal. Okay
- You have noted a dam in phase2 under grade controls, however, you did not mention this as an impoundment in step 4.5. If there is a dam this would also need to be updated in Phase 1 step 5.1. There is no dam within the reach, the FIT/DMS was updated on 2-23-07.

T1.02

- Reconcile phase1 and phase2 buffer data. The right bank is significantly different between phases. DMS updated on 2-26-07.

- You have the same value for road encroachment length between one and both sides. This looks like it may be a data entry error. FIT/DMS revised to include road encroachments on both banks only. Okay

- You have left Step 7 "stream type departure" and "historic data blank". Choose "none" and "no" rather than leave them blank. DMS updated on 2-23-07.

T2.01A – In step 2.14, the "subclass slope" is "none", the Phase 1 slope is > 2%, this suggests a "b". 2.14 was updated to "b" on 2-23-07.

Trout Head Reaches:

M03 B & C -Why is the presence of an alluvial fan "unknown"? If you didn't see one, it should be "no". If there is a reason for choosing unknown, you should comment on this in the notes. DMS was updated on 2-23-07 to indicate no alluvial fans for segment C, and alluvial fan in Segment B was added to the FIT. Good documentation.

M03B

- The bankfull width of this segment is 140% larger than the expected phase1 width (Phase 2 = 190 ft; Phase 1 = 77.6). It seems that you've given this segment too high a score for channel widening (score = 10). In looking at the DMS, for widening: row 4 would be perhaps better as "poor" instead of fair, as there is multiple braiding, bars, and islands; row 5 would be, at a minimum, in "good" as there has been channel alterations in the restoration and there are flood related sediments working through the reach. Please review and determine if the score originally given is still appropriate. Agreed. The scores have been updated (2-23-07) to reflect these changes.

M03 A & C

- In both segments your notes say that there has been straightening, however, neither reach indicates a length of reach straightened in step 5.5. Confirm that there is straightening and update the FIT and DMS as needed. The DMS/FIT have been updated to indicate the straightening in Segment C.

- It looks like you've used the same x-section data for both these segments. If a reach is segmented, each segment needs at least one (but preferably two) x-sections taken. If you only took one x-section between the two segments, make it clear which segment it was actually taken in, and provide a comment explaining why another was not taken. If more were taken, but the one chosen seemed to best represent your observations, than you must explain this clearly in your comments and report. The same cross section was used for both segments as they were very similar and would not have been segmented if not for the alluvial fan segment B located between them. The cross section was taken in Segment A. Good documenatation

- The same is true for your pebble count data and average largest particle data. See the comment above. Segments A and C were segmented only because of the alluvial fan segment B which was located between them.

M04

- There is 500 ft of bedrock gorge noted in the upper portion of the reach. It is suggested in the future that this is broken out as its own segment/sub-reach. Agreed. In the future large gorges will be broken out into separate segments.

- In step 2.14 the subclass slope is listed as "none"; the Phase 1 slope is > 2%, suggesting a "b". The DMS was updated on 2-26-07 to indicate the subclass slope of b.

M05

- With an incision ratio of 1.4, a RGA condition of "reference" in stage "I" seems inconsistent. The Phase 1 data suggested that there had been dredging in the reach. Review the RGA and consider the information of dredging in the reach and how this will affect this score and stage of channel evolution. Evolution stage changed to III as the cross section data was ~20% wider than the Phase I cross section. Condition changed to "good" based on the historic dredging.

- Phase 1 noted that there was bifurcation, there were no indications in the Phase 2 data that there had been changes in the channel (such as flood chutes, neck cute offs, avulsions). Does the bifurcation still seem appropriate in Phase 1. There were 2 islands noted during the Phase 2, but no avulsions or cutoffs so the bifurcation in Phase 1 was changed on 2-26-07.
- The cross-section data (entrenchment 2, width/depth 25) is on the cusp of a C / B. With a +/- of 0.2 allowed for entrenchment the reach could be considered a C. Do you feel confident with a "B" in a broad valley? Are there other cross-sections to support the "B" versus a "Cb"? After reviewing the cross section data and photos it seems reasonable to change the stream type to a Cb. The DMS was updated on 2-26-07. Good documentation.

T3.01-

- In phase1, drinking water was identified as a type of flow regulation. In phase2 there were no impoundments for either segment. If you can confirm the drinking water withdrawal, please provide a comment about this in the relevant reach. If there was not a withdrawal, please update phase1 to "none". No drinking water withdrawals were noted during the phase 2, so the phase 1 has been updated to none.
- The valley type is listed as "very broad", with a slope of > 3% slope. In looking at the topo it appears that there was a section of steeper stream narrower stream lumped with a wider section. Do both segments have the same valley type and slope? It is difficult to tell from the topo, but Segment B would seem to be different in valley type, do your field observations give better evidence as to valley type? Segment B does have a narrower valley and steeper slope. The phase 1 and 2 data has been updated to narrow valley for this segment.

T3.01 A This segment's stream type does not match the phase1 stream type (Phase 1 = B, Phase 2 = B). It must either be a stream type departure in step 7 OR a sub-reach in step 2.15. The segment has been designated as a sub-reach.

T3.01 B

- Your comments in the Notes section are important and should be included in your report. Agreed.
- In your narrative you note historic dredging but it is not included in step 5.5. Please confirm and update the FIT and DMS. The DMS has been updated with comments in section . The location of the dredging is unknown so dredging was not indicated with the FIT. Okay.

T3.02

- In step 1.3, the distance for roads is the same for one side/ both sides – 99 ft. Is this correct?

No, the FIT was updated on 2-26-07 to indicate roads on one side only.

- The incision ratio, 1.83, seems high for a reach in "reference" condition and stage I of channel evolution. This is a "B" stream, and "recently abandon floodplains" may be difficult to determine in the field. The cross-section sheet downloaded from the DMS, does not have a "bench" feature

at the "abandoned floodplain" elevation, simply a point. There does not seem to be evidence that there was recent incision in looking at what was checked under degradation on the DMS. Do you feel this was an abandoned floodplain that was seen along the entire reach, or a geologic feature? Probably more of a geologic feature than a RAF. Based on the other data and visual observations it does not appear that significant degradation has occurred in this reach so the incision ratio has been updated to reflect this. Good documentation

T4.01

- In the notes there is 800 ft of bedrock gorge noted. In the future it is recommended that this be broken out as its own segment/sub-reach. Agreed.

- There is a note in the QA comments on the beaver dam and length affected, or in this case not affected; please add the comment about beaver dam not yet causing impoundment to the "notes" to help with data evaluation and use. Completed 2-26-07.

- This reach has a very high incision ratio,1.82, has had some straightening, has sedimented riffles, has been significantly rip-rapped. These seem to suggest that a score of "Good" is too high. Re-evaluate the score and either add comments that support it or adjust it to reflect the data. Data updated to reflect stressors, reach score is now "fair".

T4.02 – The incision ratio, 1.76, seems high for a reach in "good" condition. This is a "B" stream, and "recently abandon floodplains" may be difficult to determine in the field. The cross-section sheet downloaded from the DMS, does not have a "bench" feature at the "abandoned floodplain" elevation, simply a point. There does not seem to be evidence that there was recent incision in looking at what was checked under degradation on the DMS. Though in Phase 1 there is gravel mining noted, so this may have caused historic degradation. Do you feel this was an abandoned floodplain that was seen along the entire reach, or a geologic feature? After reviewing the data and photos, the incision of 1.8 does not seem accurate and the RAF indicated on the cross section was probably more of a feature and not an abandoned floodplain. No evidence of dredging was noted during the phase 2. The incision ratio has been updated and the evolution stage and condition changed to "reference" and stage I. Good documentation

T4.04 – The buffer widths between Phase 1 and Phase 2 are significantly different, Phase 1 = 0-25 both sides; Phase 2, left >100 and right =26-50. Update Phase 1 if possible. Updated 2-26-07. Thank you.

T4.03

- Under step 7.1 – degradation the "historic" is noted as "no"; is there still degradation happening or likely to happen? Should have been historic, DMS updated 2-26-07.
- Your note of change in planform is good, please be sure to include it in your report discussion. Were you able to make a shapefile of where the new stream line should be? There are not many clues (such as flood chutes, avulsions; low bank erosion amounts) that there was such a dramatic change. There are several point pars and a couple diagonal bars. Did this appear to be flood related or what other features were left on the landscape from the old channel? There wasn't much on the ground evidence of the planform changes other than the diagonal bars and recent point bars, though they are evident when comparing the phase 1 stream line to the 2003 aerial

photo. We have created a shapefile which shows the current stream line. Thank you. It is interesting along the Trout to see how dramatically it can change planform.

T5.01 –

- An "A" stream type is listed in step 2.14; cross-section measurements (entrenchment 1.43, width/depth 14) suggested a "B" stream type. There is the ability to use a +/- 2 factor for width/depth and this could then support the "A" stream type given. Are there additional cross-sections that support an "A" versus a "B" and/or explain why the +/- 2 factor was used to support an "A" stream type. The Phase 1 slope, 4.22 % is on the cusp of a B and A, as is the confinement type; so additional information to support the "A" stream type will be helpful. The data is right on the edge of being an A or B, A was chosen based mainly on field observations (steeper steps/pools) which suggested A was more appropriate. Also the Phase 1 reference type was A. Good documentation.

- Is the old concrete dam noted in the "notes" across the channel or just along the sides? Would it act as a grade control? The dam was built mostly on bedrock but was no longer spanning the channel so it would not be a grade control. The dam remnants were only along the left bank.

- The incision ratio, 2.2, seems high for a reach in "reference" condition and stage "I". This is a "A / B" stream, and "recently abandon floodplains" may be difficult to determine in the field. The cross-section sheet downloaded from the DMS, does not have a "bench" feature at the "abandoned floodplain" elevation, simply a point. There does not seem to be evidence that there was recent incision in looking at what was checked under degradation on the DMS. Also, if the incision really is 2.2; that would automatically put the score for step 7.1 –degradation in "poor". Do you feel this was an abandoned floodplain that was seen along the entire reach, or a geologic feature? As with the other cross sections for the A and B stream types the RAF was probably not correctly defined and the feature captured was just a geologic feature. The DMS has been updated to account for this error. Good documentation.

T6.01 - There are multiple types of bars listed in Phase 2, and only "point" listed in Phase 1, please update Phase 1. Done 2-27-07.

T7.01 – The incision ratio, 1.56, seems high for a reach in "reference" condition and stage of channel evolution of "I". This is a "B" stream in a semi-confined valley, and "recently abandon floodplains" may be difficult to determine in the field. The cross-section sheet downloaded from the DMS, does not have a "bench" feature at the "abandoned floodplain" elevation, simply a point. There does not seem to be evidence that there was recent incision in looking at what was checked under degradation on the DMS. Do you feel this was an abandoned floodplain that was seen along the entire reach, or a geologic feature? See similar comments above. The RAF and incision have been updated. Okay.

Trout River Report Review

Staci Pomeroy reviewed the report in April 2007. A digital copy was not available so a list of things to be corrected is noted here. The overall format and information is fine, helpful thoughts on what types of potential projects a reach may have was also good. There were just some minor corrections. Please respond to the corrections noted to help track the changes made. *Adam Robtoy addressed the comments on 4-27-07. My responses are in Italics.*

1) Please go back into the Phase 1 database and update the tributary names for those tribs that are actually named. I didn't catch this on the first QA review, but as was reading the report and going back to look at data realized that you had a name (ie: West Hill Brook, but the top of the data sheet was "un-named trib to M...."). You do not need to reprint the data sheets, but it would be good for future efforts when the data sheets are re-printed to actually see the name of the brooks that have names. *The Phase I database was updated on 4/27/07 to include the tributary names.*

2) page 2 – Geographic Setting

- First sentence – "The Tyler Branch……" This is the "Trout River" *The report was updated on 4/27/07.*

3) Page 4 – Ecological Setting

- Do you have a reference for the statement " the Trout River was known for its fishing opportunities though in recent years the quality of the fishery has diminished". Is this a known fact, where it has been documented that the fisheries had diminished or is it a perception? If you are not able to find a reference, please restate the sentence to allow for more data to be researched to back up that statement. *The report was updated on 4/27/07. The reference for this statement was added (VT DEC Trout River Restoration Report from 2001).*

3) page 16 - Reach M05 -

- third sentence; update the stream type noted for "reference Phase 1 to (Cb-cobble). You have noted that it is a 2.7% slope, so the sub-script for slope should be added. *The report was updated on 4/27/07.*
- fourth sentence from bottom - The sensitivity rating for M05 .....further adjustments <u>that</u> ..... change "that" to "than" *The report was updated on 4/27/07.*

4) page 18- Reach T2-01

- T2-01A; the habitat geomorphic scores - 0.54 is "fair" you have it listed as "good" *The report was updated on 4/27/07.*
- T2.01B - I missed this in the first QA, but reading it made me want to confirm with you the incision ratio for this reach; similar to some of the other B streams where you'd had a high incision ratio; I had asked if you felt this was truly a historic flood plain or was it a geologic feature. The incision ratio is 1.9, and the reach was given a "good" for geomorphic condition. Much of the reach has been rip-rapped too, which may be keeping it from adjusting. The adjustment is noted as historic, and may have been triggered from the gravel mining that happens at the bridge. Please confirm that the feature noted as "abandoned floodplain" is an abandoned floodplain and not a geologic feature, and do you feel a "good" rating (moderate adjustment) is still an accurate depiction of this reach. *After reviewing the cross section data the incision of 1.9 was deemed to be accurate. The overall geomorphic rating of "good" was retained due to the lack of aggradation, planform, and widening adjustment processes observed. The degradation score was in the low "fair" category, but when added with the "good" scores for aggradation, planform, and widening the overall geomorphic score was "good".*

5) page 21 – Reach T3.01B

- fifth sentence; "scores were 0.73 and 0.80…… ; please add "respectively" or some other way of knowing which score goes with habitat and geomorphic *The report was updated on 4/27/07.*

6) Page 31 – Bridge and Culvert Assessment

- Do you know the landowner on Reach T4-04, South Branch Rd., it is noted that there has been manipulation of the gravel bars upstream and downstream of the private structure, and berming. I have contacted Chris Brunelle to see if there was a permit given for this activity; there was not. We would like

to determine who the landowner is, and work with them to get a permit and/or find alternatives to this practice. *I am not sure who the current landowner is, MRBA conducted the landowner outreach for the Trout so they may have this information.*

APPENDIX C

REACH BREAK LOCATION MAPS

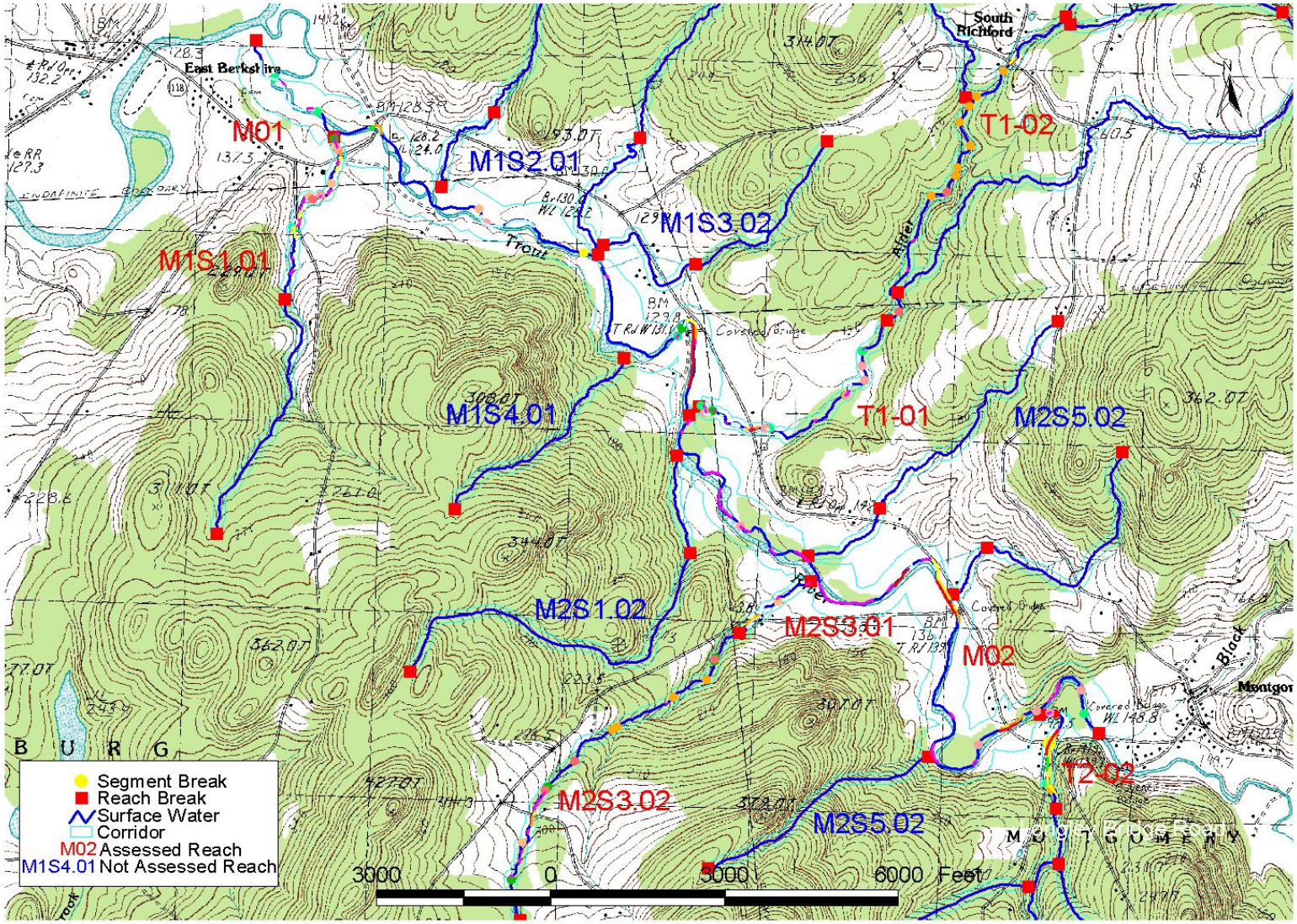

Plate 1 Locations of Reaches M01, M02, T1-01, T1-02, T2-01, M1S1.01, M2S3.01 and M2S3.02 along the Trout River watershed.

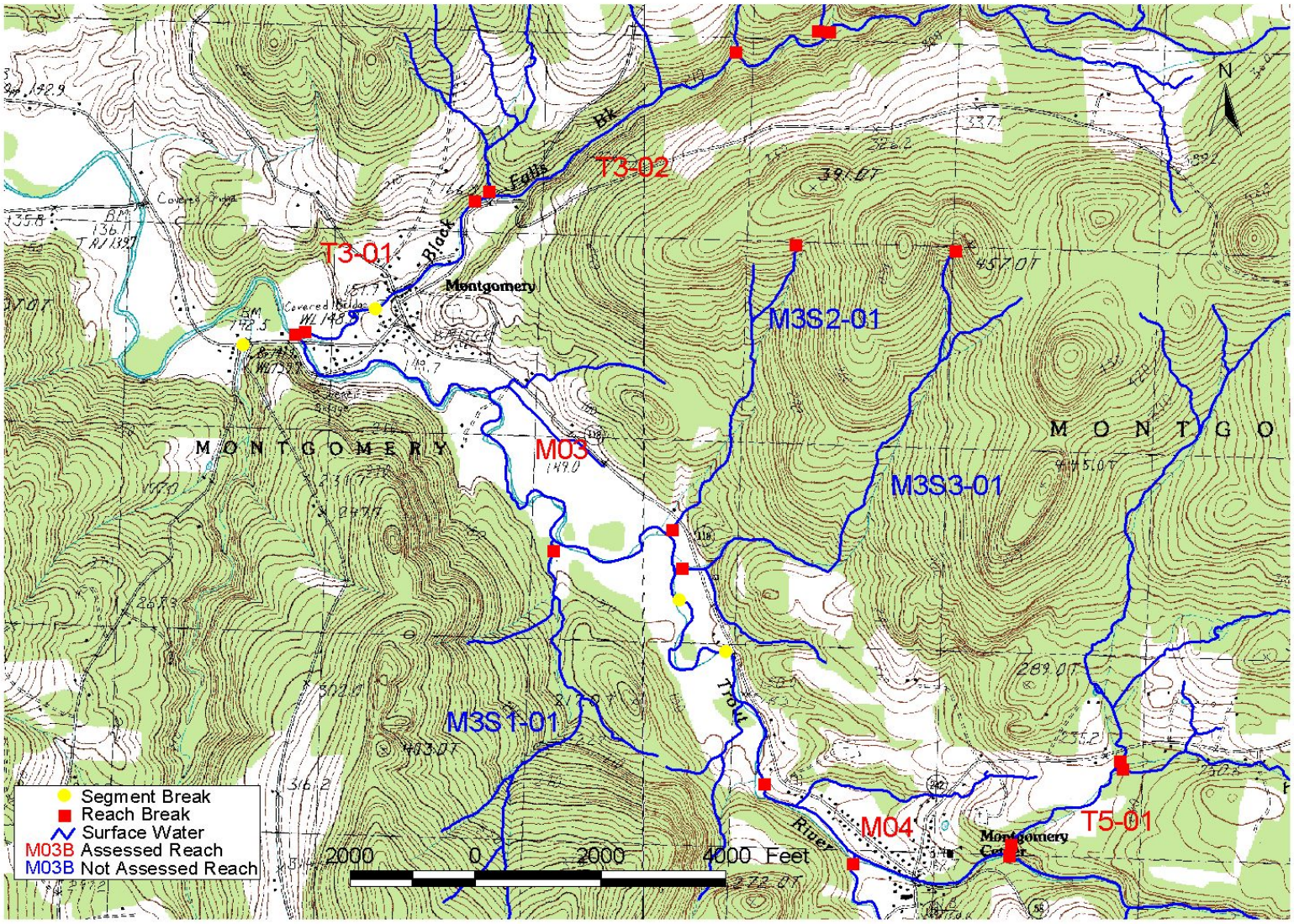

Plate 2 Locations of Reaches M03, M04, T3-01, T3-02 and T5-01 along the Trout River watershed.

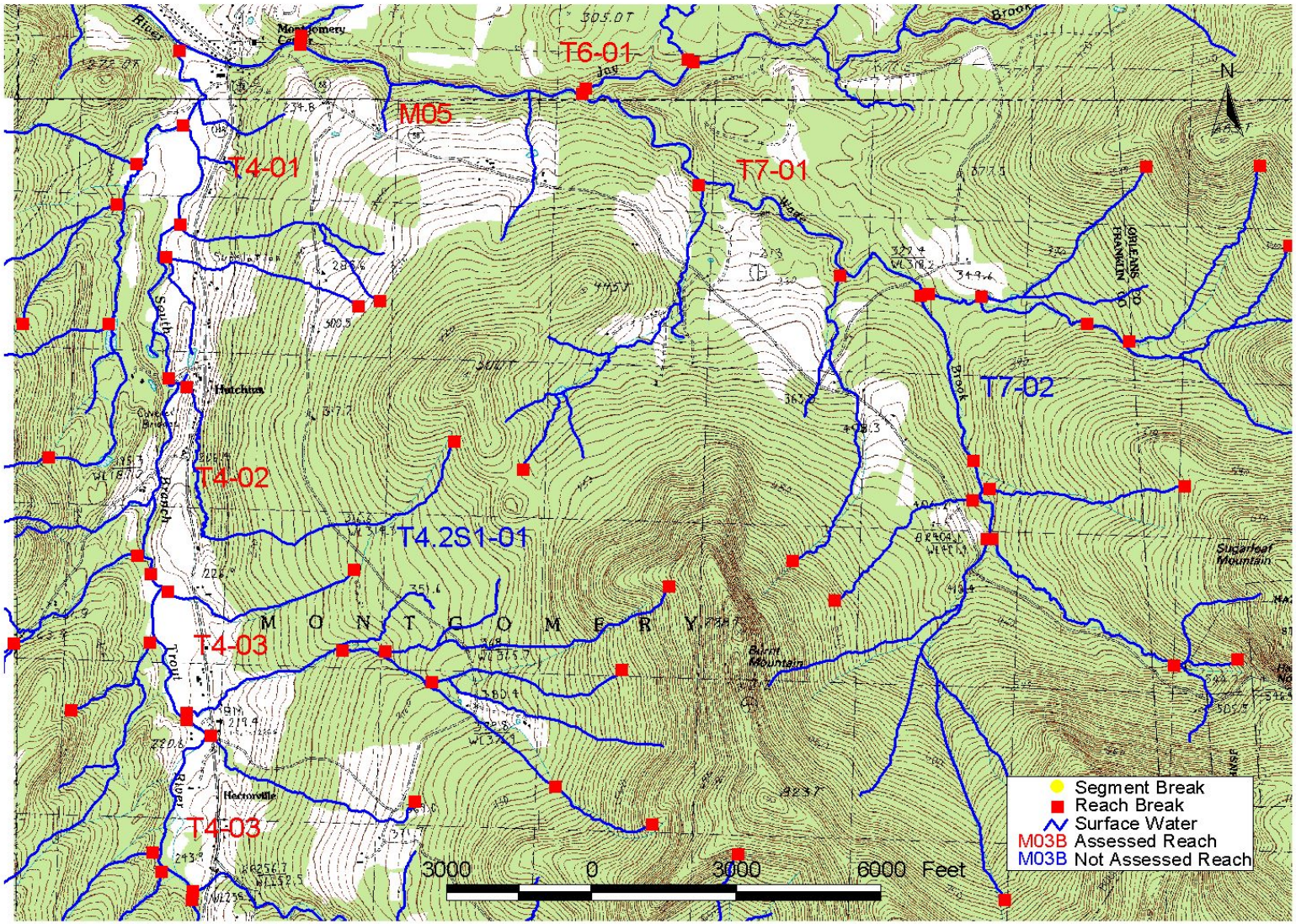

Plate 3 Locations of Reaches M05, T4-01, T4-02, T4-03, T4-04, T6-01, and T7-01 along the Trout River watershed.