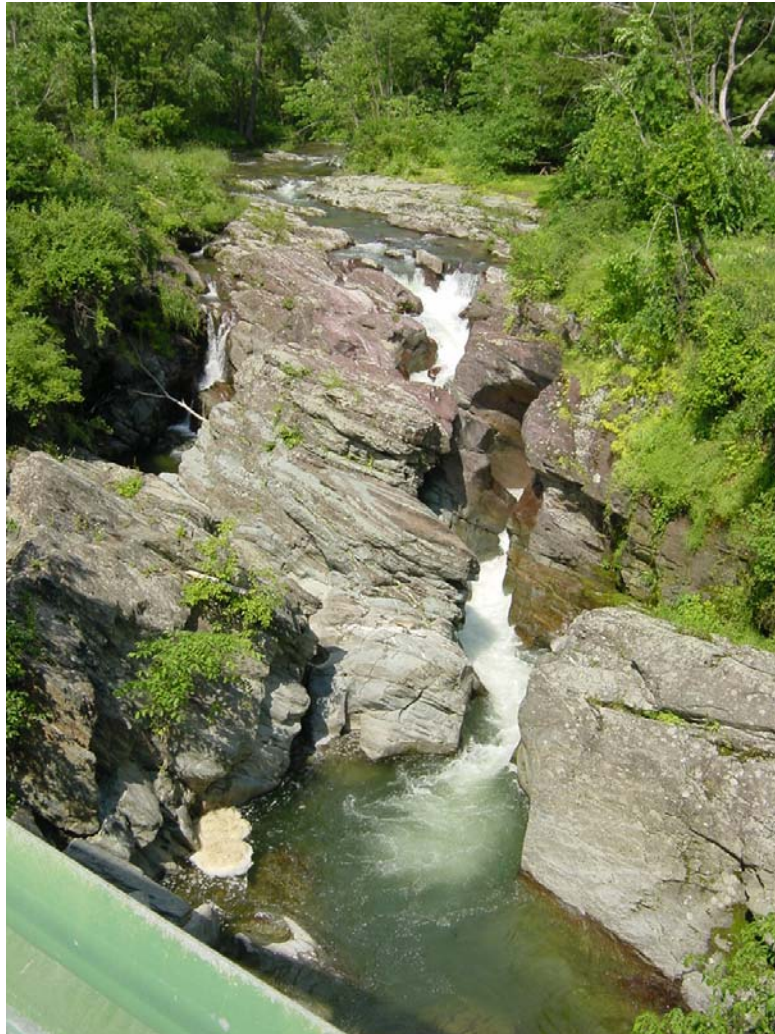


Poultney River Geomorphic Assessment and Stream Corridor Plan



**Prepared by the Poultney-Mettowee
Natural Resources Conservation District**

December 2006

<u>EXECUTIVE SUMMARY</u>	<u>1</u>
<u>PROJECT OVERVIEW</u>	<u>2</u>
<u>BACKGROUND</u>	<u>2</u>
GEOGRAPHIC SETTING.....	2
<u>PHASE 2 ASSESSMENT METHODS</u>	<u>4</u>
RAPID GEOMORPHIC ASSESSMENT	5
RAPID HABITAT ASSESSMENT.....	6
BRIDGE AND CULVERT ASSESSMENT.....	6
QAQC SUMMARY	7
CORRIDOR PLANNING	7
<u>PHASE 2 ASSESSMENT RESULTS</u>	<u>8</u>
Table 1: Summary of results of Phase 2 Stream Geomorphic Assessment	8
RAPID GEOMORPHIC CONDITION.....	9
Channel Alteration	11
Channel Constrictions.....	14
Aggradation.....	15
CHANNEL EVOLUTION STAGE	17
STREAM SENSITIVITY	20
RAPID HABITAT ASSESSMENT.....	23
Knotweed	28
<u>STREAM CORRIDOR PLANNING.....</u>	<u>30</u>
Table 2: River Segment Stressor Table	31
Table 3: River Corridor Restoration and Protection Project Table.....	33
POTENTIAL PROJECT RECOMMENDATIONS	38
Reach #: M13	38
Reach #: M14 Segment A.....	38
Reach #: M10.....	40
Reach #: M14 Segment C and M15.....	41
Reach #: M02.....	42
Reach #: M03.....	42
Reach #: M16C	43
Reach #: M16B	44
Reach #: M08.....	44
Reach #: M09A.....	45

Reach #: M09B	45
Reach #: M07	45
Reach #: M06	46
Reach #: M05	46
Reach #: M01	47
Reach #: M04	47
Reach #: M011A	47
Reach #: M12A	47
Reach #: M16A	47
Reach #: M17A	47
Reach #: M17B	48
<u>REFERENCES.....</u>	<u>49</u>
<u>ACRONYM LIST</u>	<u>50</u>
<u>GLOSSARY OF TERMS.....</u>	<u>50</u>
<u>APPENDIX A – RIVER MANAGEMENT PROGRAM PAPERS</u>	<u>52</u>
<u>APPENDIX B – STREAM CORRIDOR AND FIT MAPS</u>	<u>53</u>
<u>APPENDIX C - REACH NOTES.....</u>	<u>67</u>
<u>POULTNEY RIVER MAINSTEM</u>	<u>67</u>
M02	67
M04	67
M05	68
M06	68
M07	69
M08	69
M10	69
M11	70
M12	70
M13	71
M14	71
M16	72
M17	73
<u>APPENDIX D – PROJECT TABLE NOTES</u>	<u>74</u>
<u>APPENDIX E – PHASE 2 DATABASE REPORTS</u>	<u>77</u>

Executive Summary

Phase 2 Stream Geomorphic Assessments (SGA) were completed for 13 reaches of the Poultney River mainstem in 2006. Additional Phase 2 Assessments were completed on 4 reaches in 2005 by John Field and the Nature Conservancy. Methods for the assessments strictly followed the SGA protocols developed by the VT ANR DEC River Management Program (RMP). Please refer to the protocols for more information at:

http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassesspro.htm.

Channel straightening had affected geomorphic condition in many segments of the Poultney, mainly M02, M07, M08, M09, M10, M14A, M14C, and M15. This channel straightening led to increased channel slope, increased velocity, incision of the bed and reduction or loss of floodplain access. The resulting increased sediment transport capacity of the river results in increased erosion and increased sediment deposition somewhere downstream and ultimately in lake Champlain.

Sediment was depositing in areas where it would be expected; areas with shallow slopes, downstream of confined or heavily straightened sections, or at constrictions, bends, and debris jams. Addressing excessive sediment sources in the watershed and protecting these attenuation areas are key tasks to reduce sediment and nutrient loading of Lake Champlain.

Habitat conditions also appeared to suffer as a result of human activities. Reduction of riparian vegetation and unstable banks were key parameters affected. Stemming from these effects was increased fine sediments, embedded substrates, and reduced niche spaces for food and cover.

Project Overview

The Poultney-Mettowee Natural Resources Conservation District (PMNRCD) conducted Phase 2 Stream Geomorphic Assessments (SGA) on 13 reaches of the Poultney River mainstem in 2006. Additional Phase 2 Assessments were completed on 4 reaches in 2005 by John Field and the Nature Conservancy, for a total of 17 reaches.

The PMNRCD also began a stream corridor planning process by exploring potential stream corridor restoration and protection projects that were geomorphically compatible with the current channel condition and adjustments. The goals of the Stream Corridor Plan (SCP) were to develop projects with the goal of increasing the capacity for stream corridor capture and storage of sediment and nutrients in the watershed in order to reduce sediment and nutrient loading of Lake Champlain.

Overall River Management Program goals for stream corridor planning are:

- To define and achieve water resource goals and objectives,
- To assess the degree of stream departure from equilibrium and the condition of instream and riparian habitat,
- To identify potential restoration and protection projects that would support stream dynamic equilibrium conditions and reduce potential future conflicts between human investments and stream channels and their associated expenses.

The Phase 2 study utilized data collected from a Phase 1 study, which delineated the Poultney River watershed, major tributaries and their watersheds, and collected remote sensing data such as slopes, stream type, land use, riparian buffers, soils, and channel modifications. Through this stream assessment, the PMNRCD has increased its information base of channel conditions, adjustment, and evolution in the watershed, which can now be used to plan and complete other projects in the basin and to guide town planning and zoning in and near the river and riparian areas. Information from this assessment can be used to identify high risk areas and areas in need of restoration. This information base can also be used as an educational tool to help improve land use practices in the watershed and limit losses of infrastructure, houses, agricultural land and habitat, and reduce sedimentation and nutrient loading of Lake Champlain. Data from the assessment is provided to the VT DEC River Management Program to add to their Data Management System (DMS) of Vermont watersheds.

Background

Geographic Setting

Figure 1 shows the locations of the Poultney River watershed. The Poultney watershed encompasses 262 square miles in the towns of Poultney, Fair Haven, West Haven, Middletown Springs, Tinmouth, Ira, Castleton, Pittsford, West Rutland, Hubbardton, Benson, Orwell, Sudbury, and Wells.

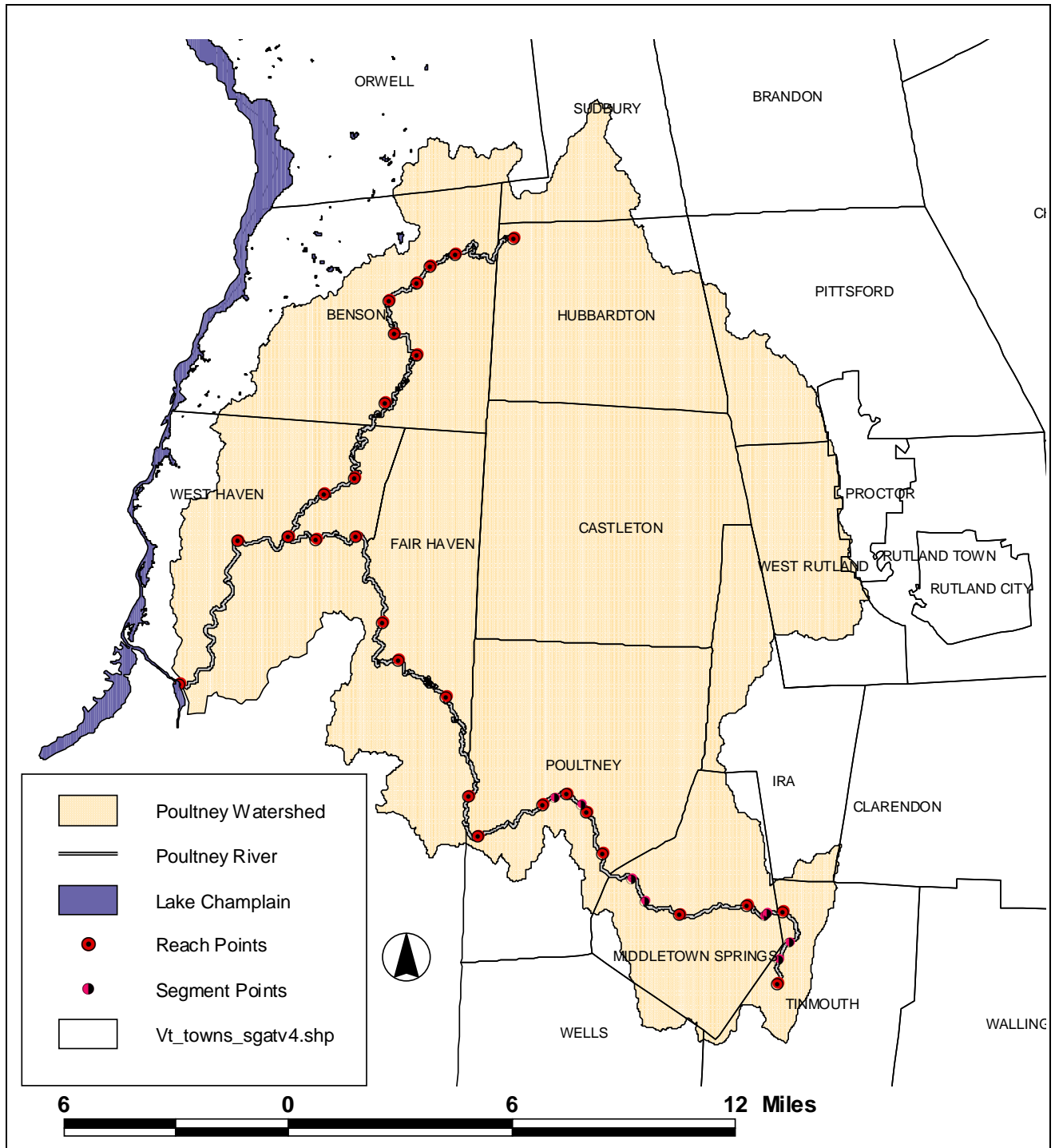


Figure 1. Poultney River watershed.

The Poultney River mainstem flows through Tinmouth, Middletown Springs, Poultney, Fair Haven, and West Haven before emptying into Lake Champlain. Many bedrock ledges (Figure 2) and waterfalls separate the valleys and shallower-sloped stream sections. Slate quarries are abundant in the watershed. Major tributaries to the Poultney River include the Hubbardton and Castleton Rivers, Cogman Creek, Mud Brook, Lewis Brook, Finel Hollow Brook, Laverly Brook, and South Brook.



Figure 2. Bedrock ledges in reach M06 and M11B.

Phase 2 Assessment Methods

This project exclusively used the VT DEC Stream Geomorphic Assessment Protocols (the Protocols) (April 2005) to perform the Phase 2 Assessment and utilized data and information collected in the Phase 1 Assessment.

The following tasks were completed in the Phase 2 Stream Geomorphic Assessments according to the Protocols:

- Notified landowners along study reaches before performing the assessment along their segment of river;
- Used the Phase 1 data, field checked reaches and types identified in Phase I and segmented or modify as necessary;
- Walked the length of each reach to map features and evaluate conditions;
- Photographed and mapped reaches and segments and collected GPS points;
- Identified natural and artificial features of the channel and adjacent valley (watershed zone, channel constraints, floodplain terrace, valley slope, habitat barriers);
- Measured channel dimensions, bankfull and flood elevations and depths, width-to-depth ratio, entrenchment ratio, riffle-step distribution, substrate size and verified stream typing;
- Evaluated stream banks, buffer strips, and riparian corridor;
- Documented flow modifiers such as impoundments, springs, wetlands, drainage ditches, constrictions, and condition of the upper watershed;
- Identified evidence of channel bed and planform changes;
- Conducted a Rapid Habitat Assessment (RHA) using the RHA field form developed by VT ANR;
- Conducted a Rapid Geomorphic Assessment (RGA) using the RGA field form developed by VT ANR;
- Entered all data into ANR Stream Geomorphic Assessment Data Management System.

Please refer to the Vermont DEC River Management Section website for more information about the protocols and methods at: http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassesspro.htm.

Rapid Geomorphic Assessment

The RGA is useful in evaluating current stream processes, departures from a reference condition, and stages of channel evolution for a given reach. Three separate RGA forms are used in the Phase 2 SGA, one for unconfined streams, one for confined streams, and one for naturally occurring Plane-Bed streams. Parameters evaluated in the RGA are summarized as follows:

- **Degree of channel degradation or incision** (sharp changes in slope, measured incision and entrenchment ratios, loss of riffle-pool characteristics, floodplain encroachment, historical channel or flow alterations).
- **Degree of channel aggradation** (filling of pools, loss of riffle-pool characteristics, mid-channel or diagonal bars, increases in fine sediments, high width-to-depth ratios, flow alterations, sediment deposition upstream of constrictions).
- **Degree of channel widening** (high width-to-depth ratios, scour on both banks at riffles, mid-channel or diagonal bars, historical channel or flow alterations).
- **Change in channel planform** (bank erosion on outside meander bends, flood chutes or channel avulsions, mid-channel or diagonal bars, additional deposition and scour features, floodplain encroachment, sediment deposition upstream of constrictions).

Please refer to the VT ANR Protocols for more on the RGA (VTANR, April 2005).

According to protocols, once a RGA is completed and a “condition” category selected, a stage of channel evolution is determined. One of two channel evolution models can be used; either the F-stage model or the D-stage model.

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

In the D-stage model, aggradation, widening, and planform changes are the main adjustment processes, with degradation being limited, sometimes by resistant bed material or grade controls. The D-stage process can include moderate entrenchment and loss of bed features (Stage IIb), channel widening and/or planform changes (Stage IIc), bed aggradation, bar formation (Stage IIId), and regaining a balance similar to reference condition (Stage III).

Please refer to the VT ANR Protocols Appendices for more information on channel evolution models (VTANR, April 2005).

Parameters for the RGA and RHA were scored and assigned to the correlating “condition” category describing departure from a reference condition and degree of adjustment (VTANR, April 2005) as follows:

- Reference – Reaches in dynamic equilibrium, having stream geomorphic processes and habitats found in mostly undisturbed streams.
- Good – Reaches having stream geomorphology or habitat that is slightly impacted by human or natural disturbance, showing signs of minor adjustment, but functioning for the most part.

- Fair – Reaches in moderate adjustment, having major changes in channel form, process or habitat.
- Poor – Reaches experiencing extreme adjustment or departure from their reference (expected) stream type or habitat condition.

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

A “Stream Sensitivity Rating” was then generated for each reach or segment according to stream type and geomorphic condition. The range of sensitivity ratings includes: Very Low, Low, Moderate, High, Very High, and Extreme. These indicate the sensitivity of a reach or segment to ongoing disturbance or stressors.

Rapid Habitat Assessment

The RHA is useful in determining the ability of a given reach to support aquatic biota, the extent to which a given reach is impaired, and potential factors affecting habitat. Two separate RHA forms are used in the Phase 2 SGA, one for low gradient streams and one for high gradient streams. Parameters evaluated in the RHA are summarized as follows:

- Presence of a variety of substrate types suitable for aquatic insect colonization and cover for fish, reptiles and amphibians;
- Degree to which gravel, coble and boulder particles are surrounded by fine sediments;
- Type of bed material in pools;
- Presence of a variety of water speeds and depths to include fast-shallow, fast-deep, slow-shallow, and slow-deep;
- Variety of pool sizes to include large-shallow, large-deep, small-shallow, small-deep;
- Increase in sediment deposition on the channel bed or bars;
- Degree to which the channel bottom is exposed, reference being minimal channel bed exposed;
- Extent of channel alteration including dredging, straightening, berms, or riprap;
- Frequency of riffles or steps along the channel length;
- Channel sinuosity or degree of channel meandering;
- Amount of bank erosion;
- Amount and types of bank vegetation;
- Width of naturally vegetated riparian buffer.

Please refer to the VT ANR Protocols for more on the RHA (VTANR, April 2005).

Bridge and Culvert Assessment

Phase 2 Bridge and Culvert Assessments were also performed according to the VT ANR Protocols. Bridges and culverts crossing study reaches were assessed and field data entered into the VT ANR Data Management System. Data from these assessments can be used to guide planning for bridge and culvert maintenance or replacement. Refer to the VT ANR Protocols for more on Bridge and Culvert Assessments (VTANR, April 2005).

QAQC Summary

The VT ANR Protocols were followed exclusively in conducting the Phase 2 SGA. The project's consultant had completed the required Phase 2 training conducted by personnel from the Vermont DEC River Management Division. As part of the VT DEC Quality Control program for stream geomorphic assessments, a member of the VT DEC's River Management Division, Shannon Hill, observed assessment procedures in the field to assure the Protocols were followed appropriately. All data entered into the States DMS have been reviewed as part of the quality control program.

Corridor Planning

The corridor planning section of this report followed guidelines developed by the River Management Program and described in papers included in Appendix A.

Phase 2 Assessment Results

Table 1 presents results for each reach assessed in the Phase 2 SGA. Included in the table are the reach number, stream type, geomorphic condition category from the RGA, stage of channel evolution, stream sensitivity rating, and habitat condition category from the RHA. Please refer to the Appendices for maps showing the stream corridor and indexed features (Appendix B), summaries of each reach (Appendix C), and database reports (Appendix E) according to parameters evaluated during the assessment. Segments in rock gorges (M11B, M12B, M16B) did not have RGA, RHA or cross sections completed for them as outlined in the Protocols.

Table 1: Summary of results of Phase 2 Stream Geomorphic Assessment

Poultney Segment	Stream Type	Geomorphic Condition	Evolution Stage	Sensitivity	Habitat Condition
M01	C5c R-P	Good	I F	Moderate	Fair
M02	C5 D-R	Fair	II F	Very High	Fair
M03	C4c R-P	Good	V F	Very High	Fair
M04	F5 Plane Bed *B to F	Poor	III F	Extreme	Fair
M05	C4 R-P	Good	IV F	High	Good
M06	C5 R-P	Good	IV F	High	Good
M07	E5 D-R	Poor	IV F	Very High	Fair
M08	C5 R-P	Fair	IV F	Very High	Fair
M09 Segment A	C4c R-P	Fair	III F	Very High	Fair
M09 Segment B	C4c R-P	Fair	III F	High	Fair
M10	F4 R-P *C to F	Poor	III F	Extreme	Fair
M11 Segment A	C4 R-P	Fair	III F	Very High	Fair
M11 Segment B	A1 Cascade				
M12 Segment A	C4 R-P	Good	III F	High	Fair
M12 Segment B	A1 Cascade				
M13	C4 R-P	Fair	IV F	Very High	Fair
M14 Segment A	C4 R-P	Fair	IV F	Very High	Fair
M14 Segment B	F4 Plane Bed *B to F	Poor	III F	Extreme	Good
M14 Segment C	F4 R-P *B to F	Poor	III F	Extreme	Fair
M15	C4c R-P	Good	I F	High	Good
M16 Segment A	C4 Plane Bed	Good	I F	High	Good
M16 Segment B	A1 Cascade				
M16 Segment C	C4 R-P	Fair	IV F	Very High	Good
M17 Segment A	B4 S-P	Good	I F	Moderate	Good
M17 Segment B	B4 S-P	Good	I F	Moderate	Good

* Stream Type Departure

Rapid Geomorphic Condition

Figure 3 shows RGA Condition categories for each of the study reaches and segments. Main factors affecting RGA condition were historical channel straightening, aggradation, migration, and channel obstructions and constrictions, which are discussed in more detail below.

Geomorphic condition appeared “good” in many of the downstream reaches (M01, M03, M05, M06) as well as some upstream reaches (M12A, M15, M16A, M17A and B). These segments were in areas with little historical channel management or were recovering rapidly from disturbance. Reaches with extensive channel straightening (M02, M08, M09, M10, M14) appeared in “Fair” condition. In these reaches, straightening led to channel incision, bank erosion, and reduction in stream function.

Reach M04 appeared in “Poor” condition, resulting from severe channel incision attributed to dam operations and reduction in sediment load downstream of the dam (Figure 4). Reach M07 also appeared in “Poor” condition. Factors affecting M07 were channel straightening for highway construction resulting in extreme channel planform adjustments, bank erosion, and pending neck cutoffs.



Figure 4. Carver Falls Dam between Reaches M04 and M05.

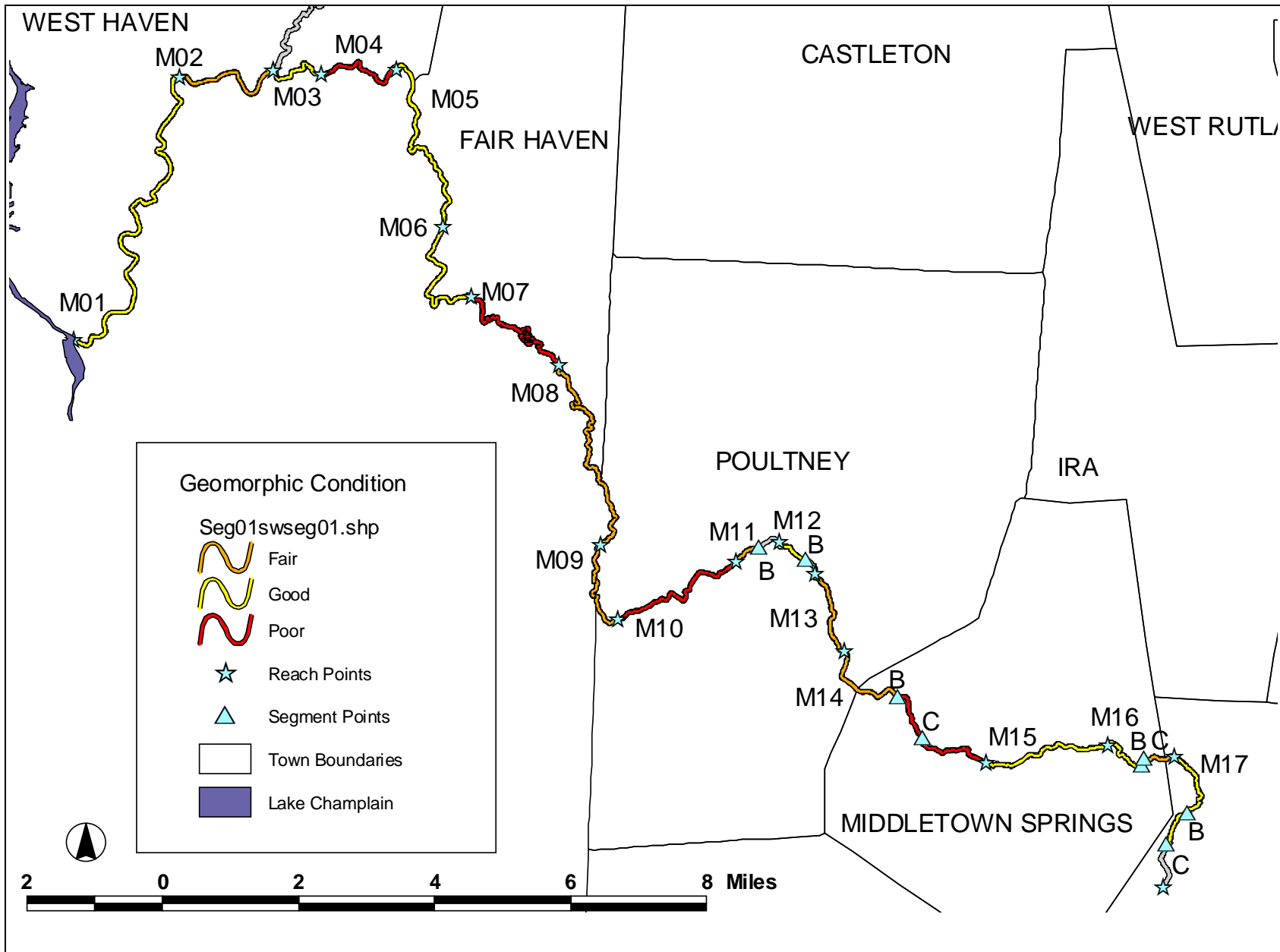


Figure 3. Rapid Geomorphic Assessment Condition category for study reaches.

Channel Alteration

Historical channel straightening appeared to have affected many of the valley reaches of the Poultney as tillable land area was increased. Along with channel straightening and heavy agricultural land use came reduction or elimination of woody riparian vegetation (Figure 5) and thus Large Woody Debris (LWD). Straightening and reduction of LWD have reduced geomorphic and habitat conditions in many of the segments, and in some cases have led to extreme adjustment or stream type departure, such as in M10, M14A, M14C, and M08. Straightening and lack of riparian vegetation increased channel slope and reduced roughness, leading to higher velocities.



Figure 5. Lack of woody riparian vegetation along M07 and M14A.

Reach M08 had been and continues to be straightened. This reach would have a very wide valley, but appeared to have been straightened and pushed over to the right valley wall (Figure 6). Under unmanaged conditions, the river would have meandered across the valley, depositing nutrient rich sediment, perfect for agriculture.

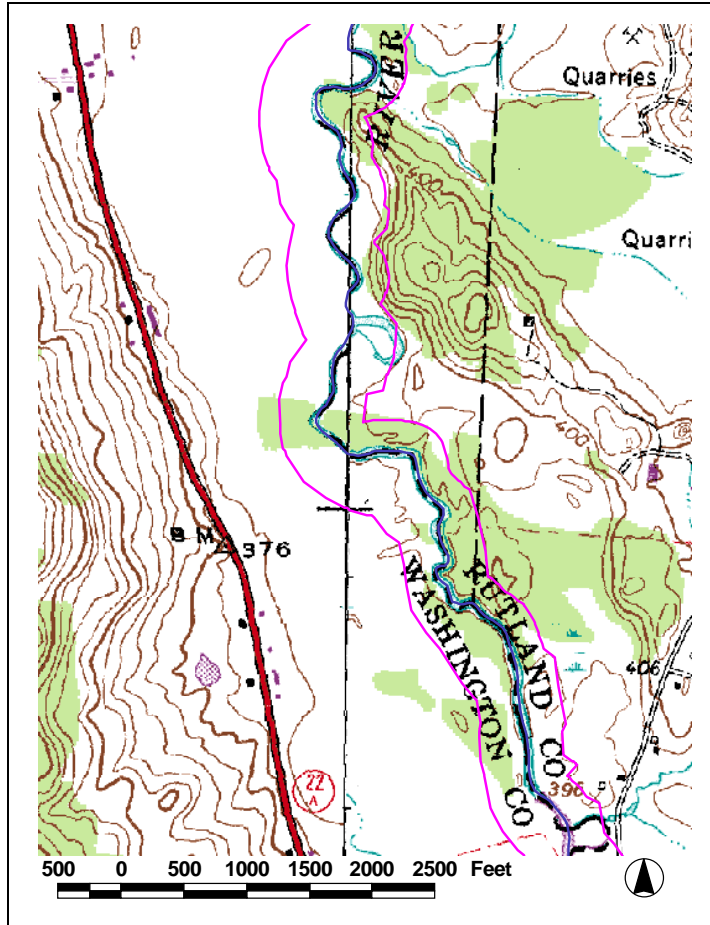


Figure 6. Topographic map showing a portion of reach M08 up against the right valley wall with a wide, flat valley on the left.

Reach M10 also appeared to have been straightened in the past. This reach is just downstream of narrower, steeper reaches and would likely have been a natural attenuation zone, where sediment would drop out of the system and where the channel would meander. This reach was also in a very wide valley just south of downtown Poultney. The assessment revealed channel incision, likely a result of channel straightening with aggradation as the current adjustment process. Much fine gravel and sand were present, with pools filled with sediment and almost absent.

Segments M14A and M14 C also had been straightened. Higher velocities in M14A were working against a gravel hill (Figure 7), which was eroding and contributing a significant amount of sediment to the system. Large bars were present downstream of the erosion site (Figure 8).



Figure 7. Gravel hill eroding and contributing sediment.



Figure 8. Large sediment deposits downstream of the gravel hill.

Reach M07 was highly sinuous with some areas straightened for fields and some recently straightened for highway construction. These straightened areas were beginning to meander again, and the reach was experiencing major planform adjustments.

Reach M02 was assessed in “Fair” condition and appeared to have incised historically following channel straightening. The reach has floodplain access at high flows, but not at bankfull flows. The reach appeared to have been straightened and was now confined by a high bank on the left and a road and a berm on the right. Some breaks in the berm provided floodplain access and the berm could be overtopped by high flows. The stream may have been moved over to the left bank to increase tillable land on the right bank. This would help explain the higher left bank. A mass failure was observed on the left bank where the river had been pushed up against the valley wall on the left and was confined

by the road and berm on the right. The increase in channel slope from straightening and reduction in floodplain access from incision and berms have likely increased the erosive pressure on this site and the tendency for bank failure.

Channel Constrictions

Undersized bridges and culverts act as channel or floodplain constrictions. These structures block the free passage of water, sediment and organic debris, and can result in flooding of land, severe aggradation of the channel and floodplain, and severe degradation downstream. Channel obstructions and constrictions along the Poultney River interfered with natural geomorphic functions. Examples of undersized bridges and culverts along the Poultney River include the Rail Trail Bridge in reach M10, the M13/14A site at the road bend, and a bar upstream of the bridge in segment M14A. (Figures 9 and 10)



Figure 9. Bridge at the Rail Trail with heavy sediment deposits upstream.



Figure 10. Sediment deposited upstream of this bridge on M14A. Photo view is looking upstream through the bridge.

The dam at the M04/M05 reach break (Carver Falls Dam) also altered stream geomorphology. The downstream area of M05 has become a pond, where sediment deposits. As the water flows over the dam to reach M04, it increases in velocity, but lacks an appropriate sediment load, termed “hungry water.” This hunger for sediment is satiated by eroding the bed and banks of the downstream area (M04). Reach M04 has experienced channel incision and now minor widening, resulting in a stream type departure from a B to an F type and appears in “Poor” condition.

Aggradation

Aggradation was a significant adjustment process in segments M03, M04, M09A, M10, M11A, M12A, M13, M14A, M14B, M15, and M16C. (Figures 11-14).



Figure 11. Aggradation upstream of debris in M08.



Figure 12. Sediment deposition upstream of a bridge channel constriction on M14A.

Aggradation was seen in segments where the channel had been straightened and was progressing through channel adjustments to regain equilibrium. Figures 11 and 12 show examples of aggradation in such straightened segments. The channel will soon begin to meander if allowed to continue along the evolution process.

Other areas of aggradation were areas with shallow slopes downstream of confined or steeper sections. In these segments, aggradation would be expected naturally as the stream has reduced power in these shallow sloped sections and sediment would naturally deposit. Figures 13 and 14 show examples of these natural sediment attenuation zones. These areas are of great value to the river system to moderate and store sediment and slow its progression to Lake Champlain. Such attenuation assets are high priority corridor protection areas.



Figure 13. Aggradation and braiding in a sediment attenuation zone in M13.

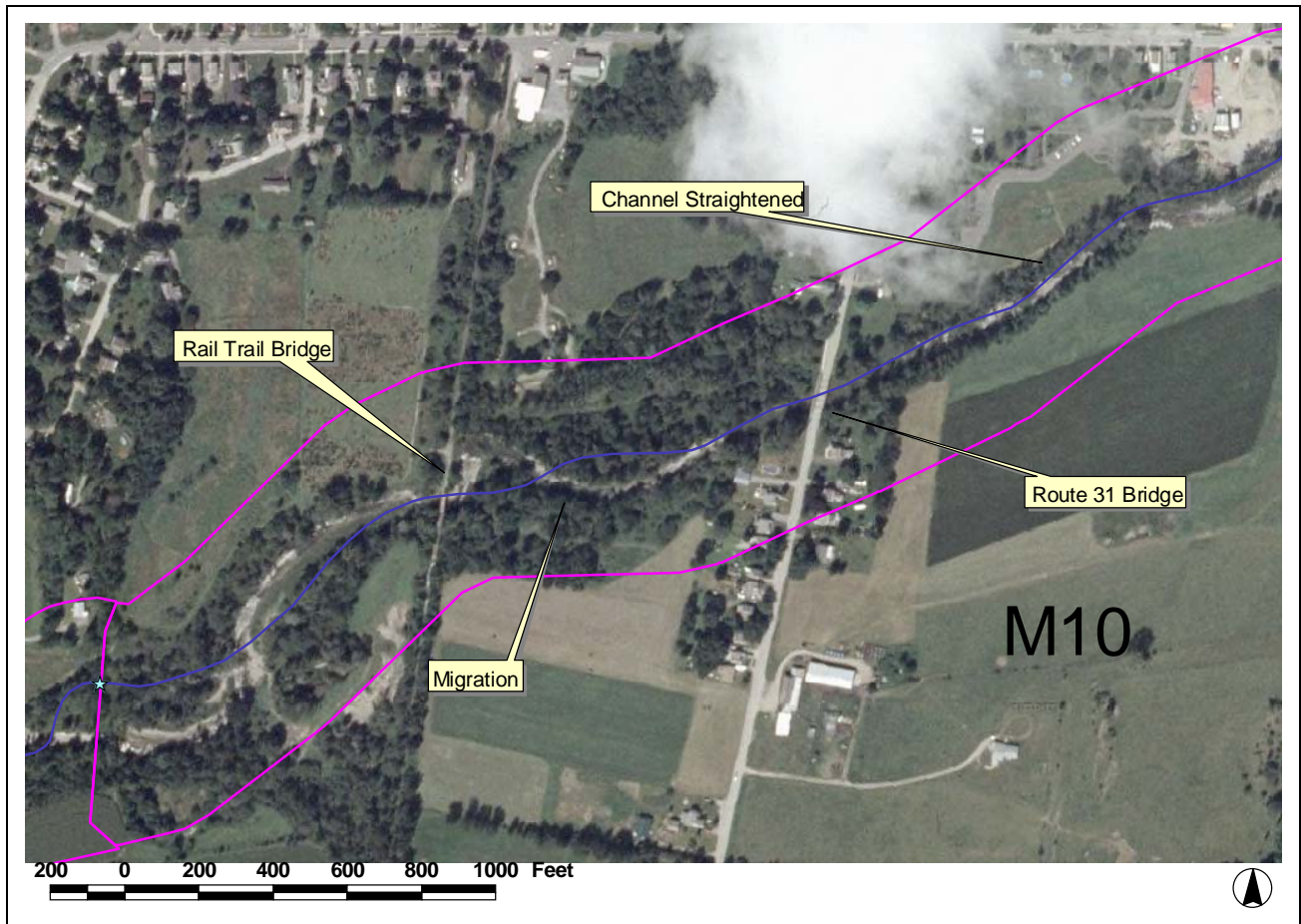


Figure 14. Aggradation and resulting migration in reach M10 is seen in this photo. This area would be a natural attenuation zone, being in an unconfined valley setting downstream of confined areas in segments M11B and M12B. The sedimentation is exacerbated by channel straightening upstream and an undersized structure for the Rail Trail.

Channel Evolution Stage

Figure 15 shows the stage of channel evolution for study reaches.

Reach M01 appeared to be “in regime” with only minor planform adjustments fitting for a low-gradient, meandering stream. Reach M15 and segments M16A, M17A, and M17B also appeared to be “in regime.” Many reaches appeared to have incised and widened and were now in stage IV, experiencing aggradation and planform adjustments. Continued bank armoring on some of these reaches was limiting their ability to complete the evolution process and regain equilibrium.

M08 appeared to be in stage IV with planform adjustments dominant. The channel was attempting to migrate (Figure 16), however continued straightening and bank armoring of this reach has inhibited the ability of the channel to regain equilibrium. Similarly, Reaches M07, M10, and segments M14A and C have experienced recent straightening and continue to attempt planform adjustments. Allowing these reaches to complete the current adjustment processes will increase overall stream stability and benefit upstream and downstream reaches by attenuating flow and sediment and improving water quality for downstream reaches, as well as reducing pressures.

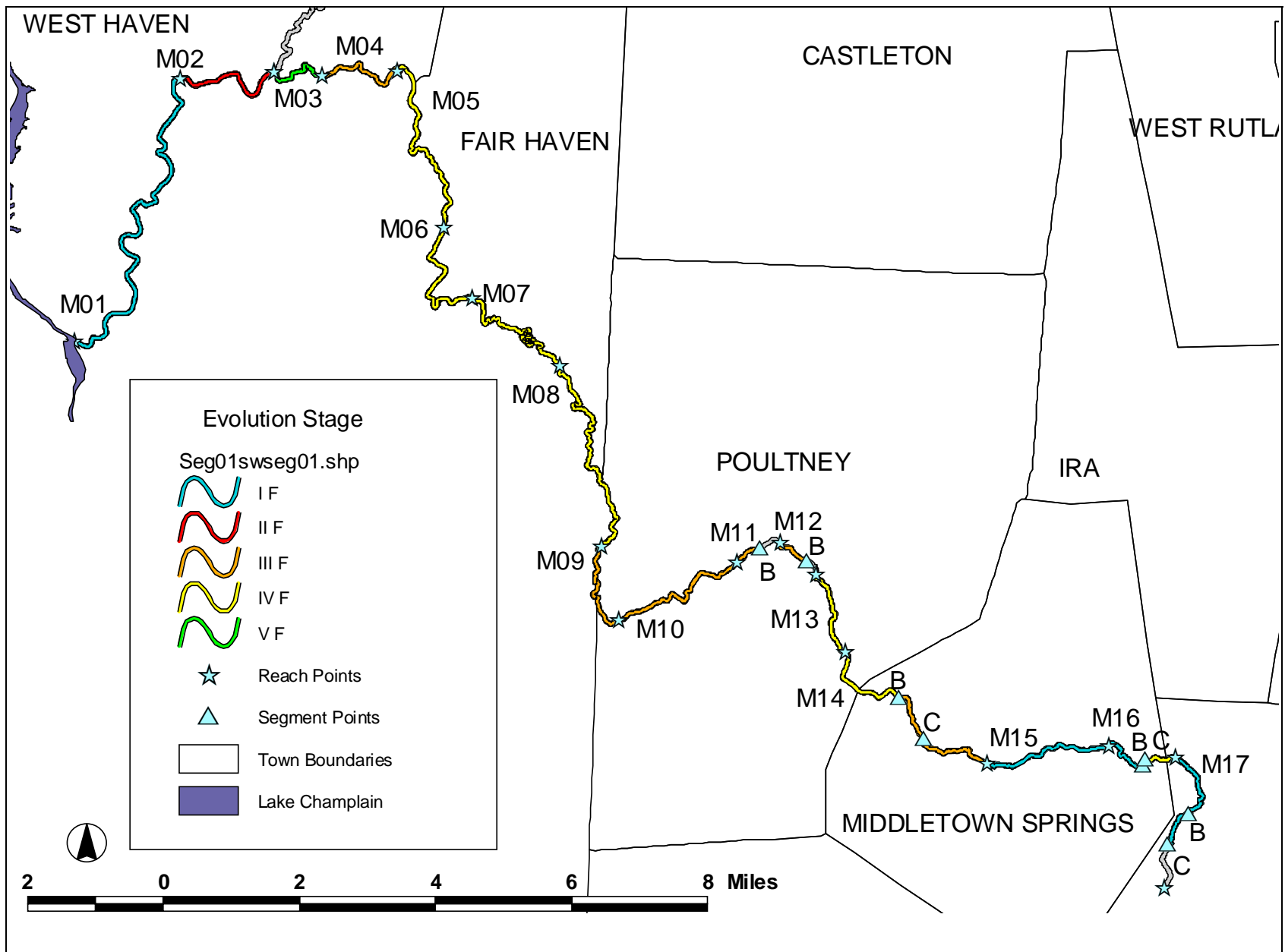


Figure 15. Stage of channel evolution for study reaches.

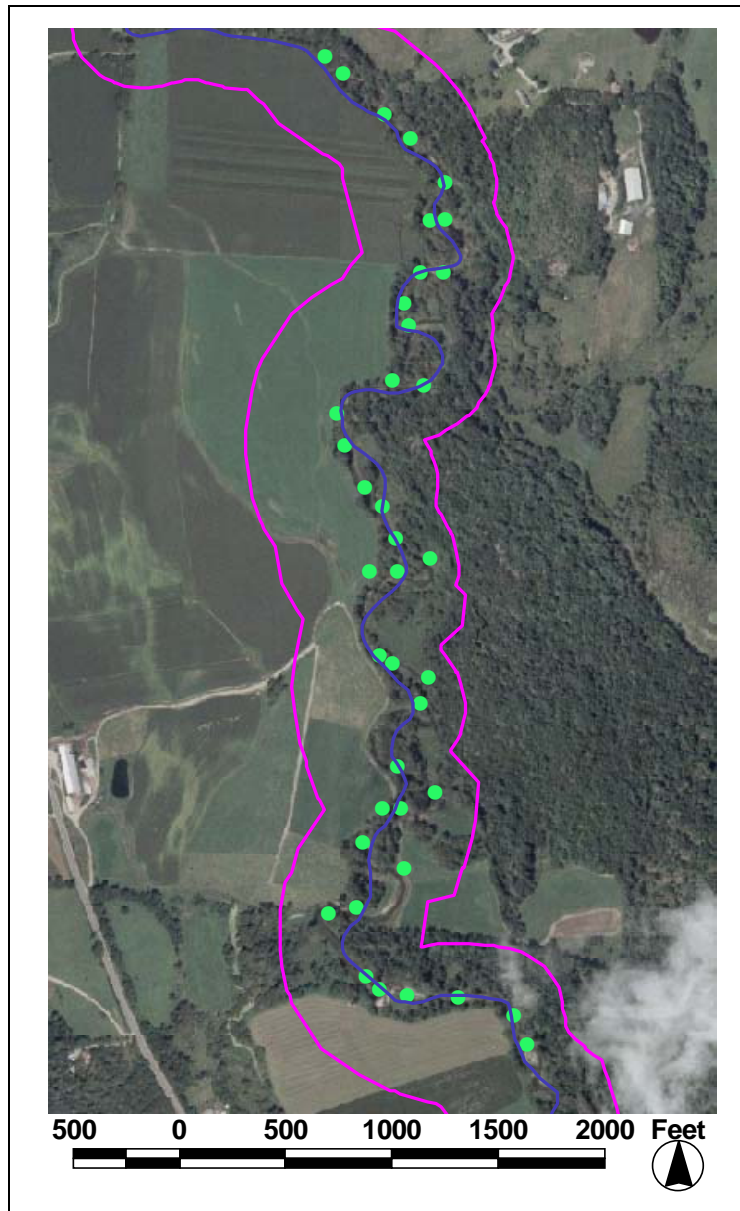


Figure 16. Reach M08, straightened and moved over to the right valley wall, was attempting to regain an equilibrium meander geometry, however continued bank armoring was limiting migration. The blue line shows a past channel pattern (stream layer) while the green GPS points show current channel pattern as traveled during the assessment.

Reach M02 appeared to be in Stage II of the F-stage channel evolution process. Channel straightening resulting in a high bank on the left and a berm along the right bank are working to prevent the channel from progressing along the channel evolution path. As pressure builds, the channel is likely to widen, resulting in more riprap and berms or loss of farm fields. Addressing these conflicts through corridor conservation can greatly reduce conflicts and expenses in the long term.

Stream Sensitivity

Figure 17 shows stream sensitivity ratings for study reaches and segments. Stream sensitivity ranged from high to extreme with only segments M01, M17A, and M17B having “moderate” sensitivity. This implies that continued or increased adjustments are likely with ongoing channel or watershed disturbance. Reaches M05 and M06, which were in “good” geomorphic condition and stage IV of the F-stage evolution process, were highly sensitive. Continued or increased stressors from upstream could push these lower reaches further into adjustment or departure. Addressing stressors such as stream alteration and channel constrictions could alleviate pressures and reduce potential for further departure or help reaches and segments achieve a dynamic equilibrium state.

The three segments with “moderate” sensitivity were located at the extreme ends of the watershed and were considered “in regime.”

Reaches M04 and M10 and segments M14B and M14C were “extremely” sensitive to disturbance. These segments had experienced stream type departures from their “reference” stream type. Reach M04 resulting from dam effects and reach M10 and segments M14B and C from channel straightening.

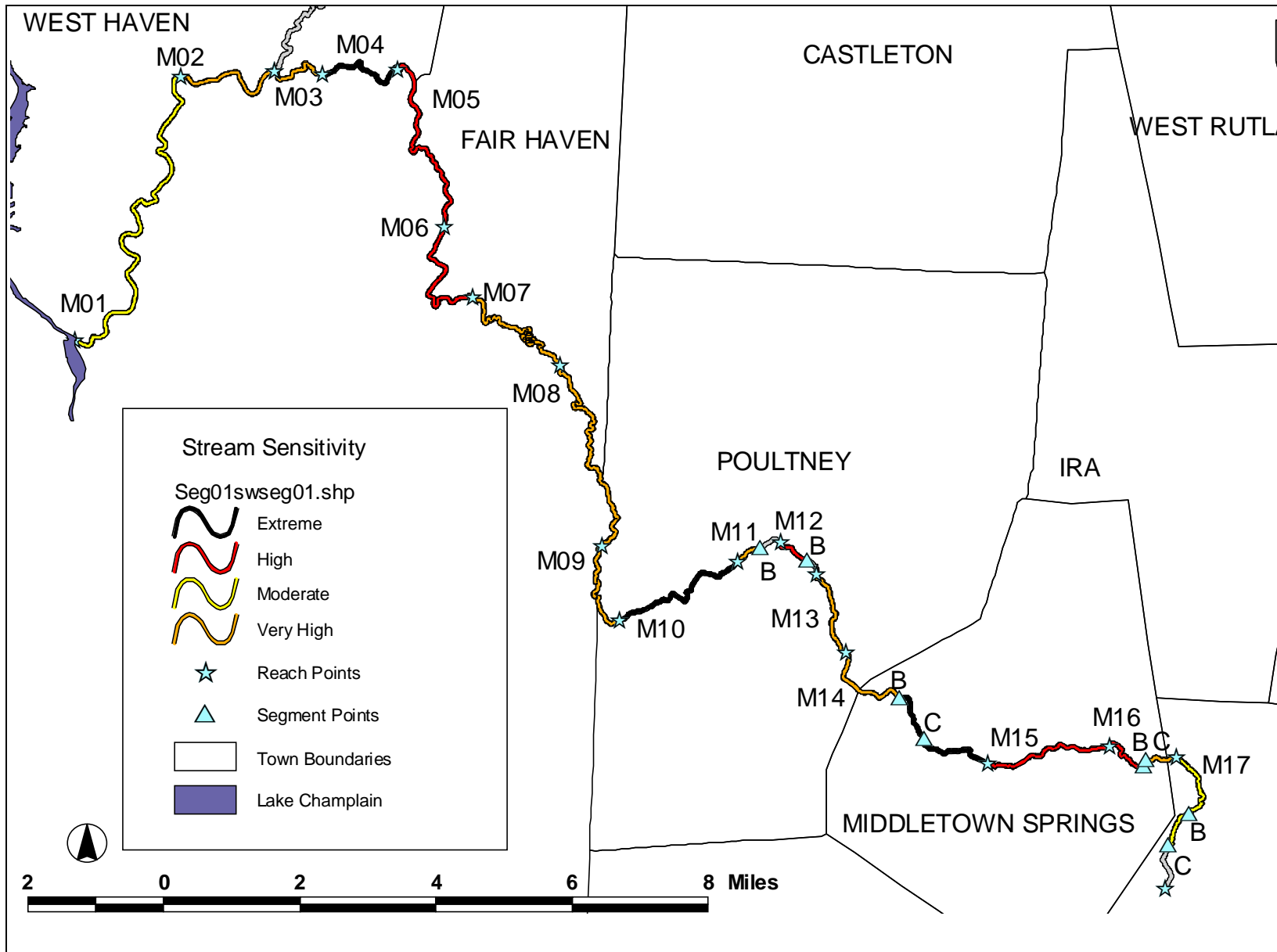


Figure 17. Stream Sensitivity Rating for study reaches. Note only segments M01, M17A, and M17B had “moderate” sensitivity.

Reach M07 was “Extremely” sensitive to disturbance. This reach was a highly meandering segment of stream with sand/silt/clay banks. Old abutments (Figures 18) constrict the channel and have been outlined as potential removal/replacement projects in Table 3: River Corridor Restoration and Protection Project Table. One abutment is just downstream of an actively migrating channel (Figure 19), some of which might be resulting from the channel being constricted at this point.



Figure 18. Old abutments constricting the channel in reach M07.

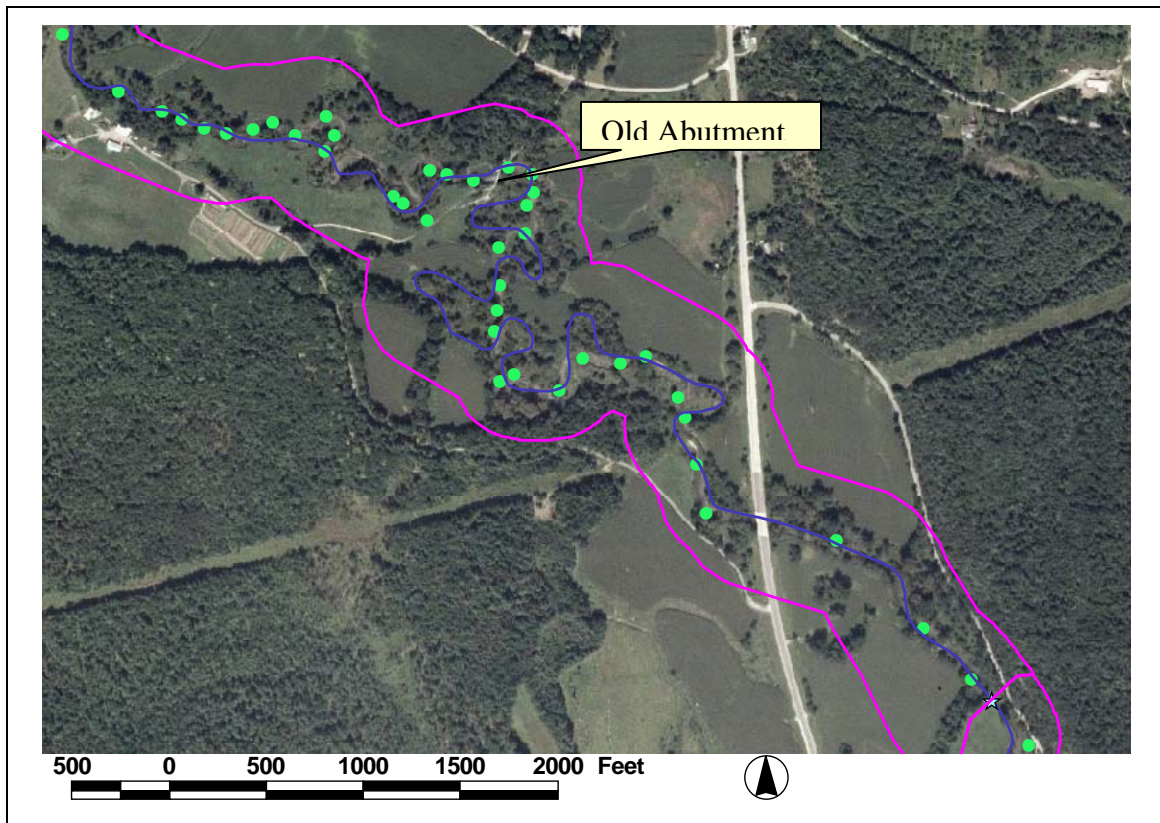


Figure 19. Aerial view of channel migration upstream of old abutment in M07 with less migration downstream of the abutment. GPS points showing actual travel along the current stream channel are in green. Stream corridor is in pink.

Rapid Habitat Assessment

Figure 20 shows RHA condition categories for the study reaches. Habitat condition was rated as “Fair” for most segments, 17 out of 25 assessed segments. Typically, reduced riparian and bank vegetation, bank instability (Figure 21), increased sediment deposition and related embeddedness of bed substrates, reduced morphological diversity, and reduced epifaunal substrate and cover were the main contributors to the low habitat condition scores. Bank instability was less of a factor in segments M12A, M11A,

Channel alteration in the form of straightening and rip-rap on both banks affected habitat scores in reach M08. Channel alteration also affected habitat in M07, which was assessed as a Low-Gradient stream.

Segment M11A was rated “Poor” for epifaunal substrate and cover, embeddedness, sediment deposition and right bank riparian buffer width. M12A also had a “Poor” rating for sediment deposition.

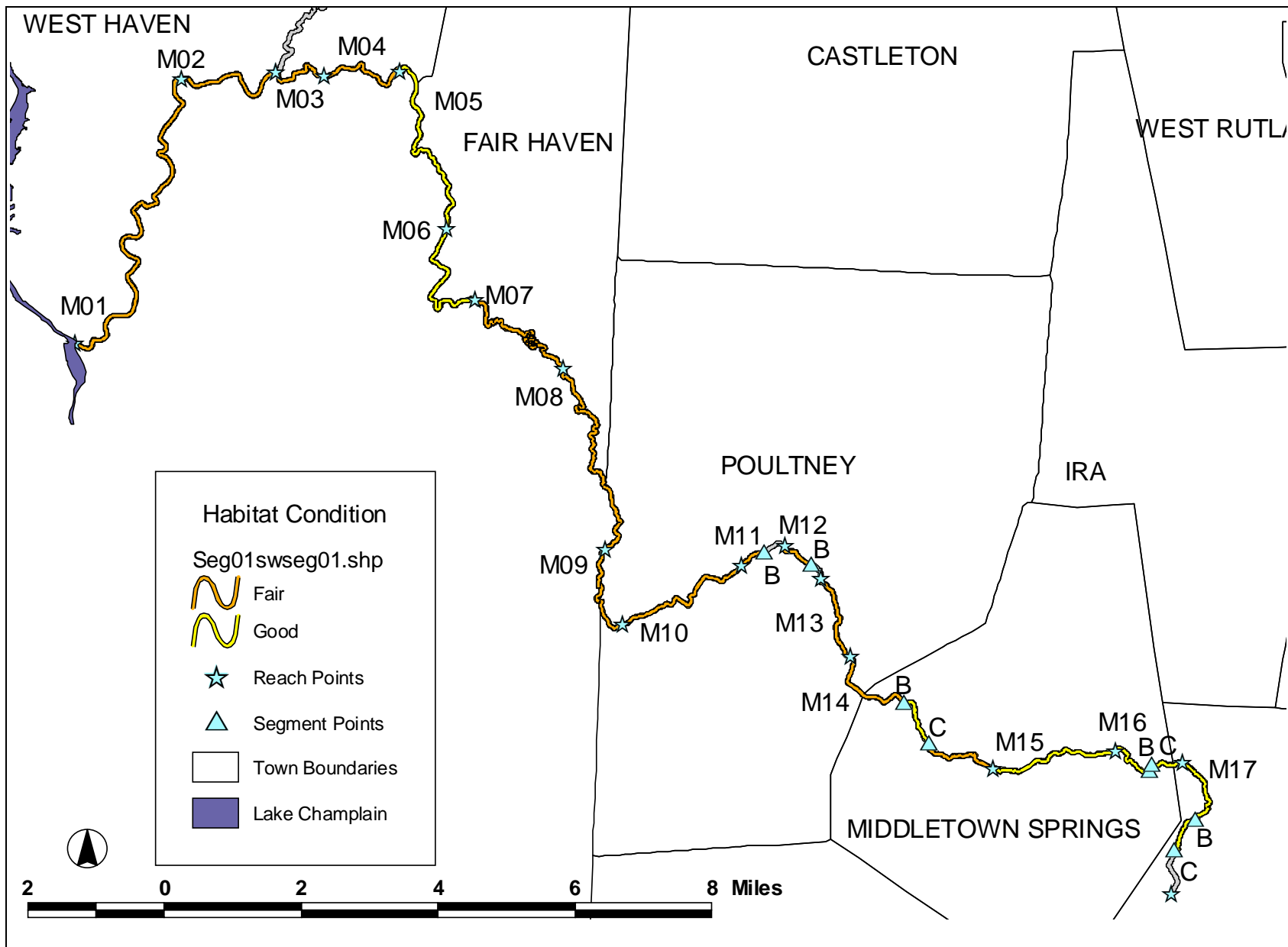


Figure 20. Rapid Habitat Assessment Condition Category for study reaches.



M03



M04



M06



M16A

Figure 21. Examples of bank instability along the Poultney River.

Only 8 out of the 25 assessed segments had habitat condition rated as “Good.” Segments Having “Good” habitat condition included M05, M06, M14B, M15, M16A, M16C, M17A, and M17B. No segments were assessed as having “Poor” or “Reference” habitat condition.

Segment M14B had “Good” habitat while having “Poor” geomorphic condition. In this segment, although the stream has experienced a stream type departure, forest cover, bank vegetation, bank stability, morphological diversity and velocity/depth mix aided habitat condition. Similarly, Segment M16C had “good” habitat condition with “Fair” geomorphic condition. Bank instability and increased sediment deposition were the main factors affecting habitat in this segment.

Segments M17A and B appeared to have habitat in “Good” condition with scores affected by sediment deposition, exposed channel substrate, somewhat embedded substrates, some bank instability and in Segment M17B reduced riparian and bank vegetation on the right bank.



Figure 22. Deer and fishing in reach M06.

Reach M06 had “Poor” left bank riparian buffer width and “Fair” epifaunal substrate and cover. But overall the habitat quality appeared higher than most other reaches. Deer were seen and the fishing (catch and release) was good (Figure 22).

Reach M05 had “Fair” bank stability due to several mass failures (Figure 23) and “Fair” embeddedness and epifaunal substrate and cover.



Figure 23. One of several mass failures in reach M05 resulting in reduced habitat and geomorphic condition.



Figure 24. While not good for boating, LWD and debris jams contribute to quality habitat by providing food, cover, and protection from high flows.

Reach M04 had “Poor” ratings for embeddedness, morphological diversity, and bank stability with several mass failures also present in this reach. Rejuvenating tributaries (Figure 25) also contributed to increased sediment in this reach as well as M02, M03, M05, and M06.



Figure 25. Rejuvenating tributaries in reaches M11 from Finel Hollow Brook (top), M03 (left), and M04 (right) with delta bars.

Knotweed

Sites where invasive Japanese Knotweed (Figure 26) was observed were marked with a GPS unit and are included in a shapefile. Sightings of Knotweed were concentrated near the town of Poultney in reaches M07, M08, M10, M11, M12, and M16. Reach M08 had knotweed all along the reach, ending in reach M07. Knotweed was not observed in reaches M02, M03, M04, M05, M06, M13, M14, and M17. Reaches M01, M03, M09, and M15 were not assessed for Knotweed.

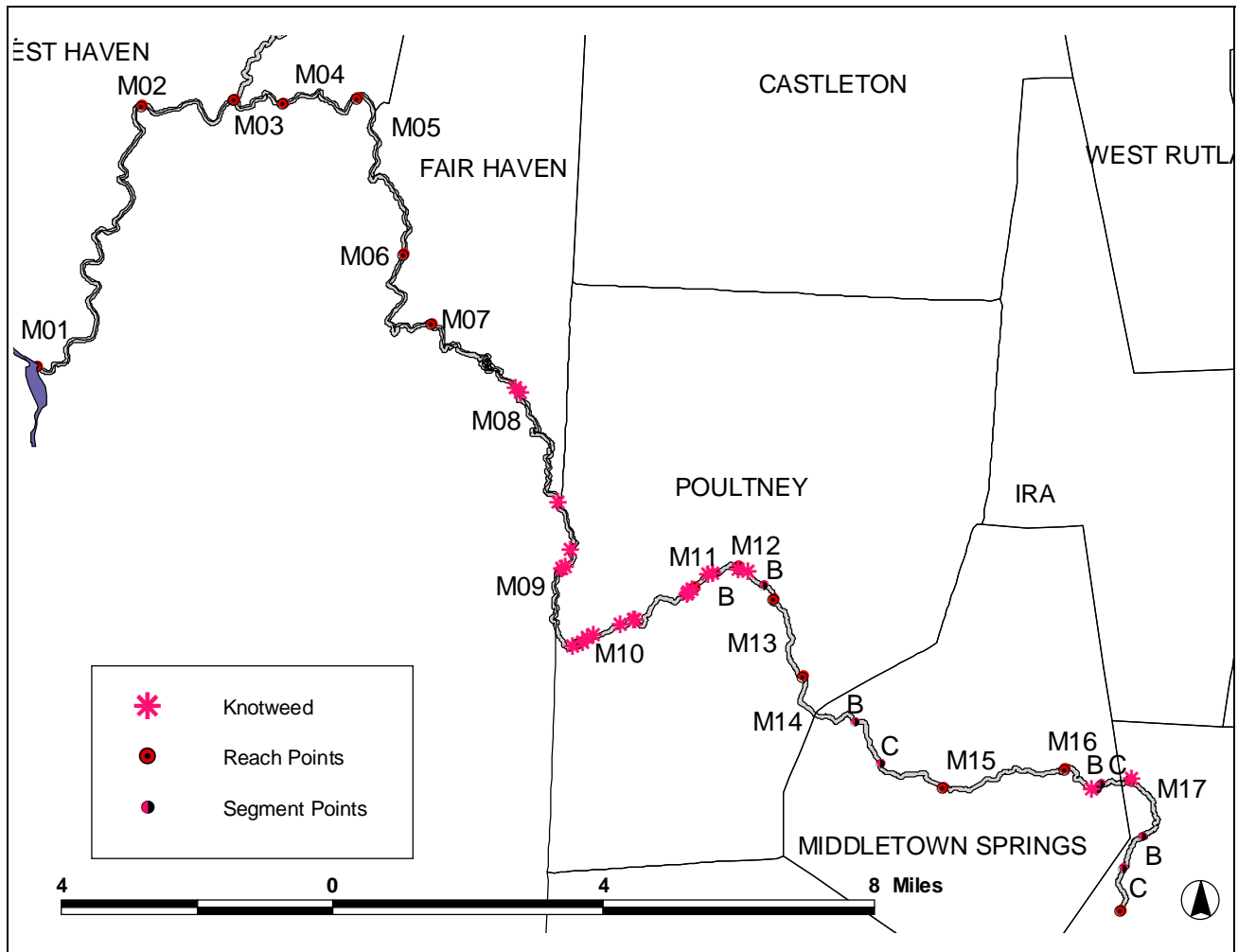


Figure 26. Sites where Japanese Knotweed was observed. Note that reach M08 had knotweed along the entire reach and GPS points were not collected for that reach. Knotweed appeared concentrated in the area between the upper portion of M07 and M12 with some seen in M16 and lower M17A.



Figure 27. Ferns and Knotweed in segment M11A at the cross section location.

Stream Corridor Planning

Following outlines developed by the River Management Program, tables 2 and 3 were developed to list river segment stressors by segment and potential projects that could lead the channel to a dynamic geomorphic equilibrium. The projects outlined meet the criteria for geomorphically compatible projects as outlined in Step 6: Preliminary Project Identification (Appendix A).

Types of projects include:

- Protecting River Corridors
- Planting Stream Buffers
- Stabilizing Stream Banks
- Arresting Head Cuts and Nick Points
- Removing Berms
- Removing or Replacing Structures
- Restoring Incised Reaches
- Restoring Aggraded Reaches

Corridor protection and conservation is an effective tool for stream restoration. Protecting stream corridors helps avoid future conflicts between streams and human investments while allowing streams room to establish their desired dynamic equilibrium. Vegetated buffers, whether planted or allowed to establish on their own, protect water quality, stabilize banks, and provide riparian habitat. Protecting the river corridor and allowing the stream to recreate its own equilibrium geometry can be more cost effective long-term than attempting to impose a calculated stream geometry in the short-term. Analyzing the desired time frame for results can help determine if a “passive” approach to channel restoration is feasible, or if a more active approach for more immediate results is desired.

A “passive” approach can be sought through perpetual corridor easements, which include the purchase of channel and riparian vegetation management rights within the river corridor. Costs of such easements have yet to be established and a holder of such an easement would need to be identified. Goals of such easements are:

- To achieve a less erosive system
- To improve water quality
- To improve instream and riparian habitat.

By allowing the stream more room to perform its geomorphic functions, the risks of disastrous channel avulsions and extreme flood damage are reduced, therefore reducing property loss and damage in the long-term. A corridor protection easement would define the protected area, define the allowed uses in that area, and dictate the river course management options.

Table 2: River Segment Stressor Table

	Watershed Input Stressors		Reach Modification Stressors	
River Segment (Evolution Stage)	Hydrologic	Sediment Load	Stream Power Bold =increase Plain=decrease	Boundary Resistance Bold =increase Plain=decrease
M01 (I)		Some deposition – trib. rejuvenation (lake level fluctuations)	Straightening	Rip-rap Reduced riparian vegetation
M02 (II)		Incision so likely transporting more; trib. rejuvenation	Straightening, berm, incision	Reduced riparian vegetation
M03 (V)	Deforestation leading to aggradation	Aggradation, Historical degradation; trib. rejuvenation	Straightening, incision	Reduced riparian vegetation
M04 (III)		Dam (R-O-R) decreasing sediment; aggradation likely from bank failures and trib. rejuvenation	Dam at us end	
M05 (IV)	Dam (R-O-R)@ downstream end	Aggradation upstream of dam; incision and minor aggradation	Grade controls Dam at downstream end	Grade controls
M06 (IV)	Ditching	Tributary Rejuvenation		Reduced riparian vegetation (minor)
M07 (IV)	Ditching		Straightening Bridge	Reduced riparian vegetation Rip-rap
M08 (IV)	Ditching		Straightening, incision	Rip-rap Reduced riparian vegetation
M09 Segment A (III)		Historical aggradation	Straightening	Grade controls, Rip-rap Dredging
M09 Segment B (III)		Aggradation	Straightening, berm	Rip-rap Reduced riparian vegetation
M10 (III)		Aggradation, historical degradation	Straightening, encroachments Bridge at Anderson's	Rip-rap Reduced riparian vegetation
M11 Segment A (III)		Aggradation, historical degradation	Sediment at Finel Hollow confl. Straightening (unsure)	Grade controls Reduced riparian vegetation

M11 Segment B			Gorge	Grade controls
M12 Segment A (III)		Aggradation		Reduced riparian vegetation
M12 Segment B			Gorge	Grade controls
M13 (IV)		Aggradation	Aggradation	Reduced riparian vegetation Grade controls Rip-rap
M14 Segment A (IV)	Ditching	Aggradation, sediment from gravel hill	Straightening Aggradation	Rip-rap Reduced riparian vegetation
M14 Segment B (III)	Ditching	Aggradation, historical degradation	Historical incision and widening, Aggradation	Rip-rap, Grade control
M14 Segment C (III)	Ditching	Historical degradation, now widening	Straightening Incision	Rip-rap Reduced riparian vegetation
M15 (I)	Ditching	Aggradation	Straightening Increased sediment at mass failure	Reduced riparian vegetation Grade control
M16 Segment A (I)		Minor aggradation	Minor widening	
M16 Segment B				Grade controls
M16 Segment C (IV)		Aggradation		Reduced riparian vegetation (minor)
M17 Segment A (I)		Minor aggradation	Straightening	
M17 Segment B (I)		Minor aggradation		Reduced riparian vegetation

Table 3: River Corridor Restoration and Protection Project Table

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps
M01	Protect River Corridor	L	L	Y	Pursue landowner agreements, Secure funding.
M01	Plant Stream Buffers	L	L	Y	Pursue landowner agreements, Secure funding, Organize volunteers.
M02	Restore Incised Reach	H	H	NA	Analyze active vs. passive approach, Study watershed scale stressors, Pursue landowner agreements, Complete more detailed survey & design, Secure funding.
M02	Plant Stream Buffers	L	L	N	Pursue landowner agreements, Secure funding, Organize volunteers.
M03	Protect River Corridor	H	H	Y	Pursue landowner agreements, Secure funding.
M03	Plant Stream Buffers	H	L	Y	Pursue landowner agreements, Secure funding, Organize volunteers.
M03	Potential Restoration/Protection Project	H	H	NA	Analyze watershed scale stressors, Pursue landowner agreements, Complete more detailed survey & design, Secure funding.
M04	Protect River Corridor	L	L	Y	Pursue landowner agreements, Secure funding.
M04	Best Management Practices				
M05	Protect River Corridor	L	L	Y	Pursue landowner agreements, Secure funding.
M05	Plant Stream Buffers	L	L	Y	Pursue landowner agreements, Secure funding, Organize volunteers.
M05	Stabilize Stream Banks	L	L	Y	Analyze feasibility and materials (hard vs. soft), Pursue landowner agreements, Secure permits & funding.
M05	Replace Structures	L	L	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M06	Protect River Corridor	H	L	Y	Pursue landowner agreements, Secure funding.

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps
M06	Plant Stream Buffers	H	H	Y	Pursue landowner agreements, Secure funding, Organize volunteers.
M06	Remove/Replace Structures	L	L	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M07	Protect River Corridor	H	H (Due to M8)	Y	Pursue landowner agreements, Secure funding.
M07	Plant Stream Buffers	H	L	Y	Pursue landowner agreements, Secure funding, Organize volunteers.
M07	Remove Structures (Old Abutment)	H	L	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M08	Protect River Corridor	H	H	Y	Pursue landowner agreements, Secure funding.
M08	Potential Restoration/Protection Project	H	H	NA	Analyze watershed scale stressors, Pursue landowner agreements, Complete more detailed survey & design, Secure funding.
M09 Segment A	Protect River Corridor	H	H	Y	Pursue landowner agreements, Secure funding.
M09 Segment A	Replace Structures	L	L	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M09 Segment A	Restore Incised Reach	H	H	NA	Analyze active vs. passive approach, Study watershed scale stressors, Pursue landowner agreements, Complete more detailed survey & design, Secure funding.
M09 Segment B	Remove Berm	H	H	N	Pursue landowner agreements,

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps
M09 Segment B	Replace Structures	U	U	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M09 Segment B	Potential Restoration/Protection Project	H	H	NA	Analyze watershed scale stressors, Pursue landowner agreements, Complete more detailed survey & design, Secure funding.
M09 Segment B	Protect River Corridor	H	H	N	Pursue landowner agreements, Secure funding.
M10	Remove/Replace Structures	H	H	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M10	Restore Incised Reach	H	H	NA	Analyze active vs. passive approach, Study watershed scale stressors, Pursue landowner agreements, complete more detailed survey & design, Secure funding.
M10	Protect River Corridor	H	H	N	Pursue landowner agreements, Secure funding.
M10	Stabilize Stream Banks	L	L	N	Analyze feasibility and materials (hard vs. soft), Pursue landowner agreements, Secure permits & funding.
M11 Segment A	Protect River Corridor	H	L	N	Pursue landowner agreements, Secure funding.
M11 Segment A	Plant Stream Buffers	L	L	N	Pursue landowner agreements, Secure funding, Organize volunteers.
M11 Segment B	NA				
M12 Segment A	Protect River Corridor	H	L	N	Pursue landowner agreements, Secure funding.
M12 Segment A	Plant Stream Buffers	L	L	N	Pursue landowner agreements, Secure funding, Organize volunteers.
M12 Segment B	NA				

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps
M13	Replace Structures	L	H	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M13	Protect River Corridor	H	H	N	Pursue landowner agreements, Secure funding.
M13	Remove Berm	L	L	Y	Pursue landowner agreements, Secure funding.
M14 Segment A	Replace Structures	H	H (Also due to 14B)	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M14 Segment A	Restore Aggraded Reach - Stabilize Stream Banks	H	H	NA	Analyze feasibility and materials (hard vs. soft), Pursue landowner agreements, Secure permits & funding.
M14 Segment A	Protect River Corridor	H	H	Y	Pursue landowner agreements, Secure funding.
M14 Segment B	Best Management Practices				Pursue landowner agreements,
M14 Segment C	Protect River Corridor	H	H	N	Pursue landowner agreements, Secure funding.
M14 Segment C	Replace Structures	H	L	N	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M14 Segment C	Restore Incised Reach	H	H	NA	Analyze active vs. passive approach, Study watershed scale stressors, Pursue landowner agreements, complete more detailed survey & design.
M15	Plant Stream Buffers	H	L	Y	Pursue landowner agreements, Secure funding, Organize volunteers.

River Segment	Project Type	Reach Priority	Watershed Priority	Independent of Reach Restoration	Next Steps
M15	Stabilize Stream Banks	H	H	N	Analyze feasibility and materials (hard vs. soft), Pursue landowner agreements, Secure permits & funding.
M15	Remove/Replace Structures	H	L	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M16 Segment A	Protect River Corridor	H	L	Y	Pursue landowner agreements, Secure funding.
M16 Segment B	Remove Structures (Old Abutment)	H	H	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M16 Segment C	Protect River Corridor	H	H	Y	Pursue landowner agreements, Secure funding.
M17 Segment A	Protect River Corridor	L	L	Y	Pursue landowner agreements, Secure funding.
M17 Segment A	Replace Structures	H	L	Y	Pursue landowner agreements, Pursue town &/or VTRANS agreements, Complete more detailed survey and design, Analyze property protection & bed stabilization measures needed, Secure funding.
M17 Segment B	Protect River Corridor	H	H	Y	Pursue landowner agreements, Secure funding.
M17 Segment B	Plant Stream Buffers	H	L	Y	Pursue landowner agreements, Secure funding, Organize volunteers.

Y – Yes; N – No; H – High; L – Low; NA – Not Applicable (in cases that the project is reach restoration).

Potential Project Recommendations

The following list of potential projects details those outlined in Table 3 and are roughly in order of watershed priority.

Reach #: M13

Location: Downstream section

Landowner(s): Gombozi

Project Type: Protect River Corridor

Background: This area appears to be actively migrating and has a wooded wetland adjacent to the channel. After traveling through multiple small gorges, the river enters this flat area, which is a good place for sediment attenuation. Active agriculture did not appear to be in the corridor here, possibly prohibited by the channel migration. Therefore conserving/protecting the corridor here could be relatively easy – very little current use here. A stream crossing for fields to the southwest was present. A bridge for that crossing would benefit the instream habitat and banks, however migration makes placement difficult. Preserving this crossing as an in-stream crossing might be the only option here. This area appears to be an attenuation zone for sediment, which would help alleviate pressures from upstream straightening.



Additional projects identified for M13:

- Replace Structures – Resize the bridge as it is up for replacement.
- Remove Berm – A small area of berm (145 feet) was present in the reach and did not appear to be protecting anything. It was a sediment source and could be removed to prevent that sediment from entering the system.

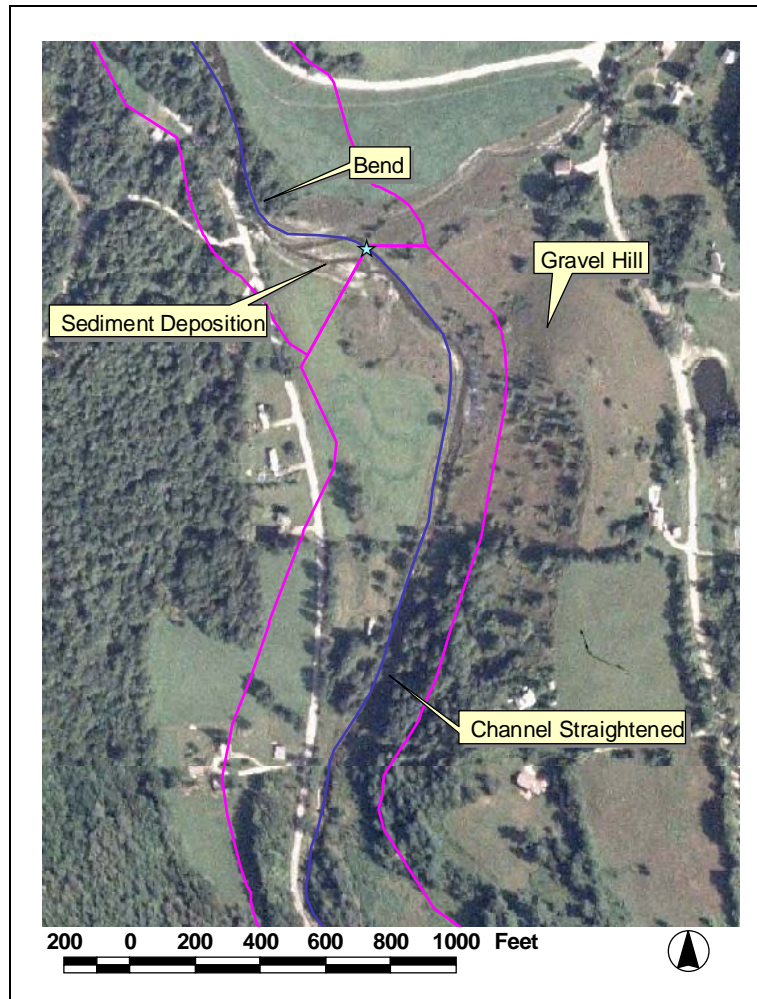
Reach #: M14 Segment A

Location: At the downstream end of the reach

Landowner(s): Seamens

Project Type: Stabilize Stream Banks, Meandering, and Protect River Corridor

Background: On the right bank, a large gravel hill was deposited by glacial activity. Now, the river is up against this non-resistant hill, eroding the gravel and carrying it downstream. Large sediment deposits have built up in the channel and migration is evident. Just downstream of this area, the channel runs up against the road on the left bank (rip-rapped) and must make a sharp turn to the right. Stabilizing the bank of the gravel hill could help by reducing sediment inputs from this source. Protecting the corridor here would help by allowing the channel to migrate and continue to deposit the sediment just downstream of the hill. Placing investments in this area would not be good. A more intensive project would be to recreate meanders upstream to reduce the pressures on the gravel hill. This could either be in an “active” way, or with placed wood to “aim” flow at opposite banks to induce meanders. One trailer on the left bank is a potential constraint. This meandering with wood placement could be carried out upstream of this site as well where the stream has been straightened for the road and what appears to be previous agricultural use. Active agriculture does not appear to be a factor, although some new houses have been built on the right bank and would need to be protected from excessive migration.





Additional projects identified for M14A:

- Replace Structure – Resize bridge as it is up for replacement to improve sediment continuity.

Reach #: M10

Location: Just upstream of the D&H Rail Trail Bridge and downstream of the Rte 31 Bridge; the remainder of the reach as lower priority.

Landowner(s): Anderson, multiple.

Project Type: Protect River Corridor, Plant Stream Buffers, Remove/Replace Structure, Stabilize Stream Banks.

Background: Aggradation and planform adjustments were observed in the area between Rte 31 and the Rail Trail Bridge. The Rail Trail Bridge appeared to constrict the channel, resulting in deposition, ponding and channel migration upstream. Reach M10 appeared to be in stage III of the F-stage evolution process with dominant adjustments being aggradation. Signs of widening and planform adjustments were also observed. The reach appeared to have been straightened in the past, which may have contributed to the incision seen in the cross section measurements and planform adjustments. Habitat condition appeared to be “Fair.” Factors affecting habitat were sediment deposition and embedded substrate, and reduced riparian buffer width. Japanese knotweed was noted in several places in the reach.

Protection of the stream corridor could help limit placing future investments and infrastructure in the corridor and associated potential future conflicts in this dynamic area. Corridor protection would also allow the river to continue to use this area to attenuate its flow and sediment load. Planting more woody buffer species is a potential project in the upstream portion of the reach where wooded buffer was limited, while the downstream portion appeared well vegetated.

Remove or resize the Rail Trail bridge to allow for sediment to pass. Monitor banks near bridges and houses for any necessary bank stabilization measures and materials (hard vs. soft stabilization techniques).



Reach #: M14 Segment C and M15

Location: Just downstream of the Coy Hill Bridge/Fox Bridge Ave and upstream in to Reach 15.

Landowner(s): Tarbell

Project Type: Plant Stream Buffers, Protect Stream Corridor, and Meandering

Background: This area currently has some bank vegetation and buffer before the cropland. Some trees exist, but more could be planted in areas where tree cover is thin. If the landowner were willing to add to the buffer width, it would help, especially in the areas where buffer width is very narrow. This is another area where wood could be used to induce meandering, although that may conflict with the current adjacent land use. The roads are constraints, upstream on the left bank, downstream on the right bank. Upstream of the bridge, the stream lacks floodplain access. Here, incision is likely related to straightening of the channel and more active floodplain re-creation could be a project, although expensive and current land use is a constraint. Resizing of the undersized bridge as it is up for replacement would help with sediment continuity.



Reach #: M02

Location: Downstream of bridge

Project Type: Protect Stream Corridor, Restore Incised Reach

Background: Berms along the road constrict the channel on the right bank, a high bank on the left limits floodplain access in that area. The incision ratio at the cross section location was 1.9 and would be reduced to 1.6 without the berm. This means that even with berm removal, the reach would still be incised. Additional restoration measures could be explored (active vs. passive restoration based on watershed-scale stressors).

The land on the left bank or maybe both banks in some areas has been conserved (Mike Kline mentioned he worked on a project here to conserve habitat). Conservation information signs were along the stream in areas, and this section of stream has the most diversity of fish species in VT. There was active farming adjacent to the channel and the berm likely helped protect that land use. A mass failure was observed in the reach and may have been exacerbated by increased velocities resulting from channel straightening and berming.

Corridor protection here would be great for habitat as well as for the stream geomorphic condition. (Compensation to the landowner for not using the fields, or they can be used, but remove the berm and plant some trees). The gravel road is a constraint; maybe it could be relocated to the valley wall rather than along the river.



Reach #: M03

Location: Reach

Project Type: Potential Restoration/Protection Project, Protect Stream Corridor, Plant Stream Buffers

Background: This reach appeared to be affected by increased sediment from M04 and tributary rejuvenation. Its location in the watershed was an area that would be sensitive to deposition; downstream of the falls and confined reach M04. The reach appeared incised with no apparent adjacent channel to recapture. More exploration of watershed stressors could help determine suitability of any restoration activities.

Some corridor protection or increase in buffer planting would help habitat here and possibly increase bank stability (Bank erosion was noted as we floated through, with GPS points taken). Active agriculture on the right bank could be a constraint. The landowner might not be willing to give up the entire valley (as shown in the stream corridor map layer) but maybe 100 feet for tree planting or corridor protection. Stream migration in this area could be a constraint to tree planting adjacent to the stream banks.

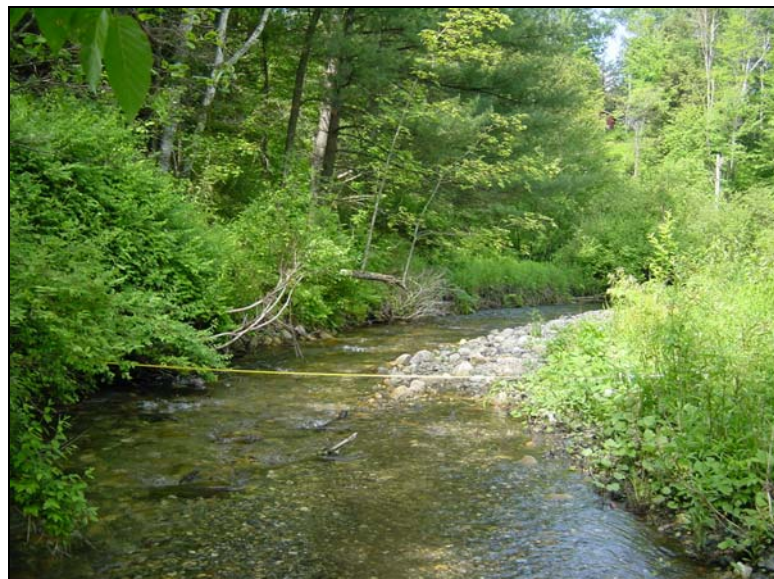


Reach #: M16C

Location: A 700 ft section just upstream of the gorge and falls

Project Type: Protect River Corridor

Background: This section appeared to be undergoing planform adjustments and had large sediment deposits. The segment had alternating large point bars and erosion of outside banks and multiple flood chutes. This appeared to be an important sediment attenuation zone and should be protected from development so it can continue this function and help relieve watershed pressures on downstream reaches. Planting would not be necessary here.



Reach #: M16B

Location: Old abutment just upstream of the falls.

Project Type: Remove Structure

Background: A large old abutment constricts the channel before the river flows over a set of waterfalls. This abutment may be contributing to sediment deposition upstream and subsequent channel migration. Removal of this structure could improve sediment continuity in the reach.

**Reach #: M08**

Location: Reach

Project Type: Protect Stream Corridor, Potential Restoration/Protection Project

Background: Reach M08 ran along one edge of a very broad valley and appeared to have been significantly straightened in the past, with continued straightening and riprap evident. Riprap was limiting channel migration to the left bank and the channel's ability to progress in the channel evolution process. Most of the issue here appeared to be on the left bank (NY side), which may mean options are limited or that projects would be more complicated due to the multi-state coordination. Working with the landowner to protect the corridor and plant some more buffer vegetation would be ideal. Such projects might be more long term, depending on the landowner situation. Defer action on passive restoration and riprap removal until landowners are ready to protect the corridor. Some recently abandoned channels may be available to recapture for restoration purposes.

Japanese knotweed was observed all along the reach. Addressing this invasive species could also help improve habitat.



Reach #: M09A

Location: Reach

Project Type: Protect Stream Corridor, Replace Structures, and Restore Incised Reach.

Background: Protecting the river corridor here is important to alleviate pressures from upstream. This segment may not adjust to an equilibrium condition if upstream areas are not addressed. Restore Incised Reach through protecting the corridor and allowing for passive restoration (and addressing upstream issues). Removal of riprap could help the segment reach equilibrium. Resize the undersized bridge as it comes up for replacement.

Reach #: M09B

Location: Reach

Project Type: Remove Berm, Replace Structures, Potential Restoration/Protection Project, and Protect Stream Corridor.

Background: Remove the berm if adjacent land use (right bank) is compatible with more frequent flooding and if landowners are willing (more information needed). Riprap removal could also help the segment reach equilibrium. Protect the downstream river corridor (M09A) as a high priority to mitigate for this segment if restoration is not feasible in the near term.

Reach #: M07

Location: Reach

Project Type: Remove Structures, Protect Stream Corridor, and Plant Stream Buffers.

Background: Two old abutments constrict the channel and do not appear to be used (no deck). Removal could improve sediment and flow continuity and reduce back up.

Protect the corridor to prevent investments from being placed in the corridor and to help reduce impacts from M08 straightening. Planting of buffer vegetation could be a project in selected areas where not likely to be removed by channel migration.



Left photo is abutment highlighted in Figure 16. Right photo is upstream of Route 22A.

Reach #: M06

Location: Reach

Project Type: Replace Structures, Protect Stream Corridor, and Plant Stream Buffers.

Background: Remove or replace undersized rail bridge to regain floodplain and sediment continuity.

Protect the corridor to allow the stream to complete channel adjustments (currently planform) and regain equilibrium. Plant stream buffers in areas away from actively migrating banks.



Reach #: M05

Location: Reach

Project Type: Protect Stream Corridor, Plant Stream Buffers, Stabilize Stream Banks, and Replace Structures.

Background: The stream corridor was free of encroachments, so protection now could prevent future encroachments and provide for habitat and channel adjustments. Areas with limited woody buffer could be planted or allowed to revegetate on their own. Bank stabilization measures could be used in

areas of mass failures (9 present in reach) to reduce sediment load. Resize the undersized bridge as it comes up for replacement.

Reach #: M01

Location: Reach

Project Type: Protect Stream Corridor, Plant Stream Buffers.

Background: This reach appeared in regime. Protecting the corridor would ensure that encroachments and investments do not interfere with stream and corridor functions in the future. Planting in areas in need of woody vegetation could improve habitat, or vegetation could be allowed to return naturally with corridor protection. Analysis of historical vegetation removal if any and the types of vegetation that would occur here should be done before planting is undertaken.

Reach #: M04

Location: Reach

Project Type: Protect Stream Corridor, Best Management Practices.

Background: This reach was affected by an increase in stream power from reduced sediment supply at the dam. These conditions are not likely to be addressed in the next 5 years as the dam is likely a permanent structure. So follow BMPs here and investigate reducing or mitigating the dam effects. Protect the corridor here as part of a long-term plan to protect the corridor along the length of the Poultney. This is a fairly low priority area due to isolation and no apparent development pressure at this time.

Reach #: M011A

Location: Reach

Project Type: Protect Stream Corridor, and Plant Stream Buffers.

Background: Protect the corridor, plant buffers and allow for passive restoration if landowners are willing (more information needed) and if sediment issues in M13-M14A and Finel Hollow Brook can be addressed.

Reach #: M12A

Location: Reach

Project Type: Protect Stream Corridor, and Plant Stream Buffers.

Background: Protect the corridor, plant buffers and allow for passive restoration if landowners are willing (more information needed) and if sediment issues in M13-M14A can be addressed.

Reach #: M16A

Location: Reach

Project Type: Protect Stream Corridor

Background: Protect the corridor, as it is undeveloped at this time. Removing the structure in M16B would help sediment continuity.

Reach #: M17A

Location: Reach

Project Type: Replace Structures, Protect Stream Corridor.

Background: Replace the undersized culvert to accommodate bankfull flow or higher. Protect the corridor here as part of a long-term plan to protect the corridor along the length of the Poultney.

Reach #: M17B

Location: Reach

Project Type: Protect Stream Corridor, and Plant Stream Buffers.

Background: Clearing and reduced riparian vegetation are possibly leading to bank instability. Protect the river corridor, plant stream buffers, and stabilize stream banks to increase bank stability and reduce sediment load. Replacing the structure is a low priority. Proceed with BMPs until sediment supply is identified (bank erosion from upstream? – the upper mainstem, M17C, was not in SGAT) and addressed possibly through stabilizing stream banks and corridor protection.

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Acronym List

DMS – Data Management System (Developed by the DEC)
GIS – Geographic Information System
GPS – Global Positioning System
LWD – Large Woody Debris
PMNRCD – Poultney Mettowee Natural Resources Conservation District
RGA – Rapid Geomorphic Assessment
RHA – Rapid Habitat Assessment
RIT – Reach Indexing Tool
RMP – River Management Program
RRPC – Rutland Regional Planning Commission
SCP – Stream Corridor Plan
SGA - Stream Geomorphic Assessment
SGAT – Stream Geomorphic Assessment Tool
VT ANR DEC – Vermont Agency of Natural Resources Department of Environmental Conservation

Glossary of Terms

Aggradation - The build up of sediment in a streambed.

Avulsion – A change in a river’s course; a section of channel that has moved laterally from its bed to create another segment of channel some distance from the previous bed location.

Bankfull width - The width of the channel at a height corresponding to the level of stream flow that would overtop the natural banks in a reference stream system, occurring on average 1.5 to 2 years.

Bankfull maximum depth – The depth of the channel from the bankfull elevation to the thalweg (see below).

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

Debris jam - A collection of large woody debris that has lodged in a stream channel and spans the channel from bank to bank.

Degradation or incision - Down cutting of the streambed by erosion of bed material.

Embedded – Larger bed substrate particles (gravels, cobbles, boulders) surrounded by fine sediment, reducing the oxygen in the substrata and the ability of organisms to retreat into the substrata for cover.

Entrenched - A state where a channel has lowered significantly and floodwaters can no longer overtop the banks and access the floodplain.

Flood chute - A small side channel crossing the inside of a meander bend where flood waters will bypass the main channel, taking a shorter route through the chute.

Floodprone width - The area outward from the channel that is at an elevation that could be inundated by a flood, measured in Phase 2 SGA as at an elevation of 2 times the bankfull maximum depth.

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

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

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

Impervious surface – A hard surface, such as concrete or a rooftop, which prevents water from infiltrating the soil.

In Regime – Referring to a stream that is in an equilibrium state, one that would be expected given the stream setting.

Large woody debris - Pieces of wood in the active channel (within the bankfull width) usually from trees falling into the channel and with minimum dimensions of 12 inches in diameter (at one end) by 6 feet long.

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

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

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

Thalweg – Deepest point along the length of the stream, as if the deepest point of all cross sections were connected. The thalweg of a meandering channel typically alternates from right to left bank connecting pools.






Width/depth Ratio – The ratio of channel bankfull width to the average bankfull depth. An indicator of channel widening or aggradation.

Windrowing - Digging material from the channel bed and piling it on the bank, creating berms.

Appendix A – River Management Program Papers

Appendix B – Stream Corridor and FIT Maps













Poultney Corridor and FIT Impact Maps

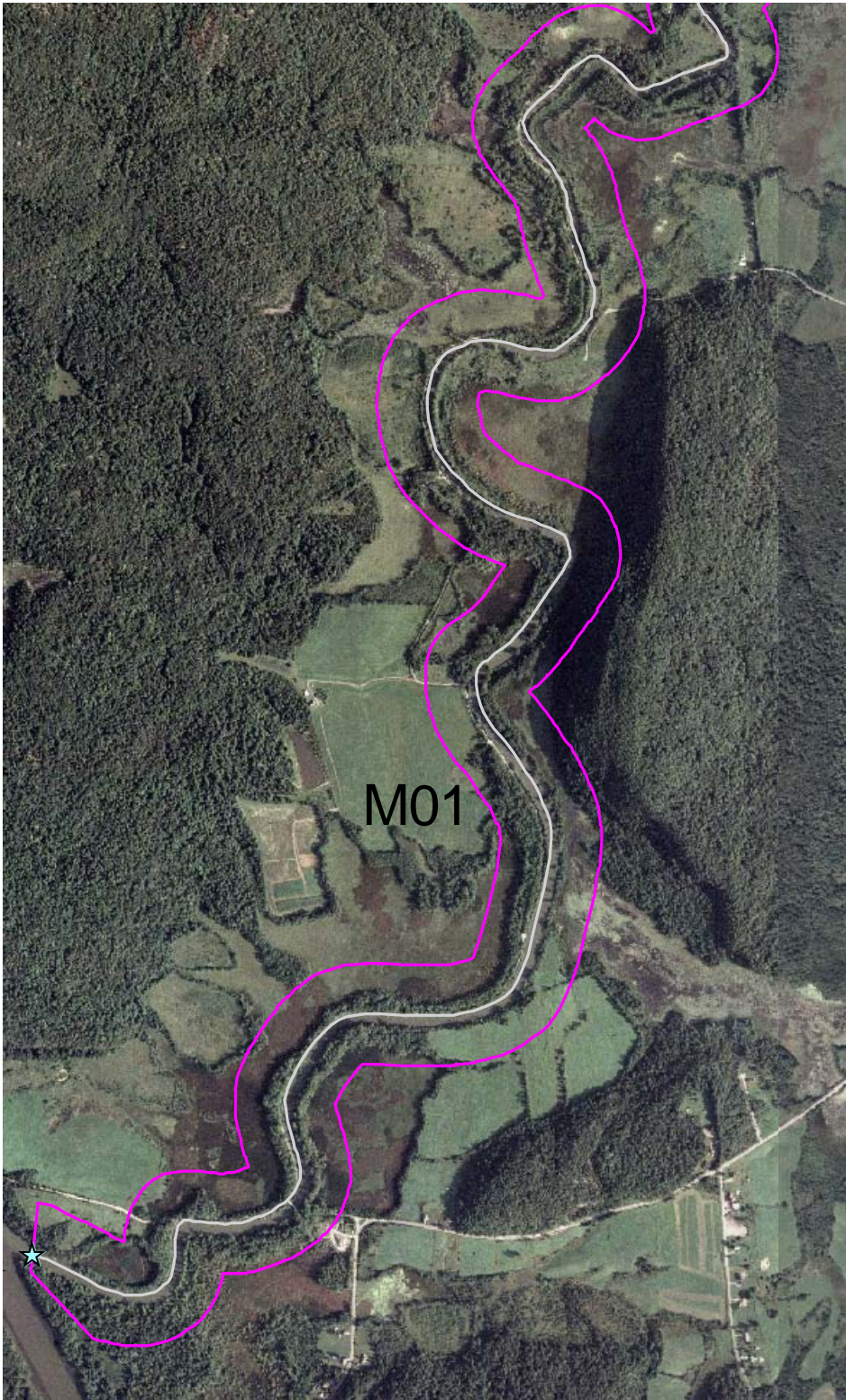
-  Reach Points
-  Segment Points
-  Cross Sections
-  Stream Corridor
-  Poultney River

Fit01Inimpactseg.shp

-  Bank Armoring or Revetment
-  Bridge or Culvert
-  Development
-  Encroachment
-  Erosion
-  Straightening

Fit01ptimpactseg.shp

-  Alluvial Fan
-  Dredging
-  Grade Control
-  Migration
-  Stream Crossing
-  Mass Failure
-  Debris Jam
-  Stormwater Input
-  Beaver Dam
-  Migration
-  Steep Riffle or Head Cut
-  Stream Crossing
-  Gully



M01

M01



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M01

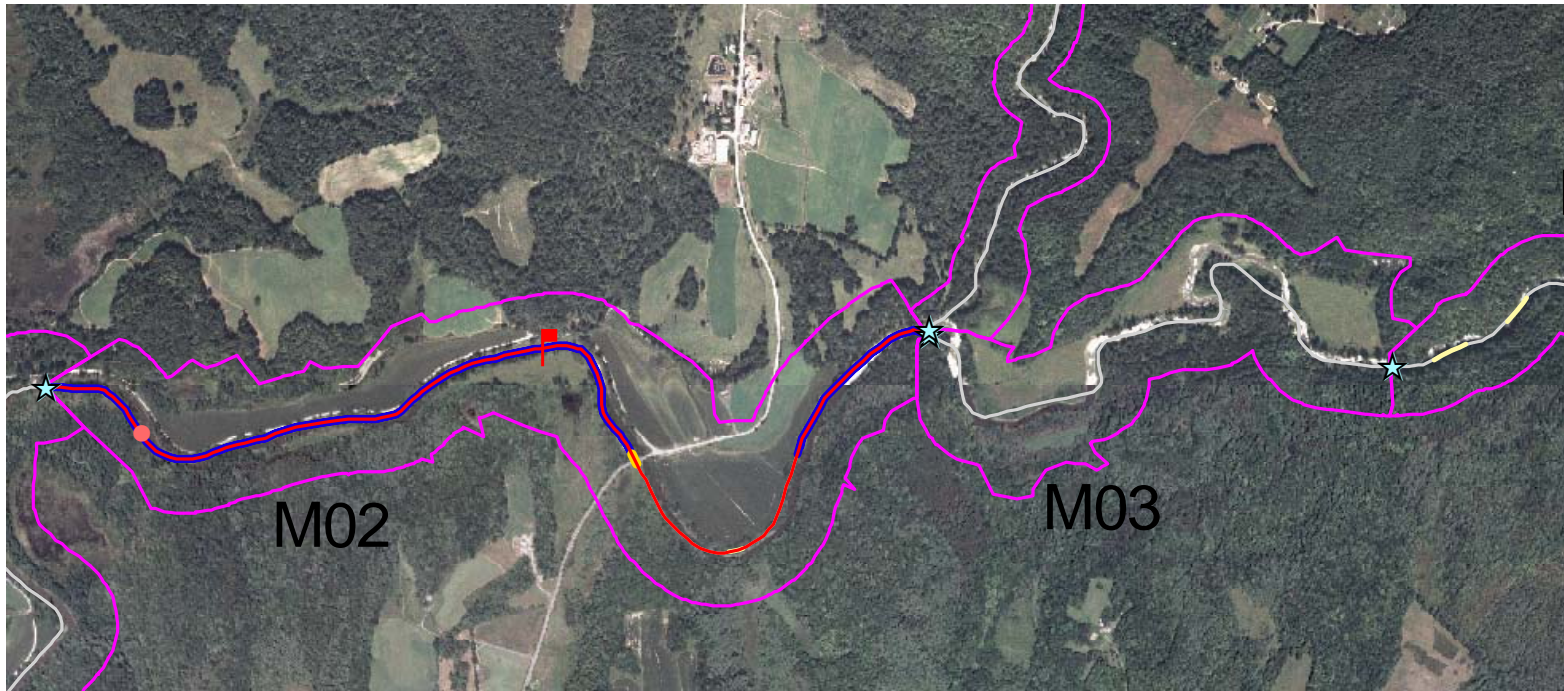
Page2

M02

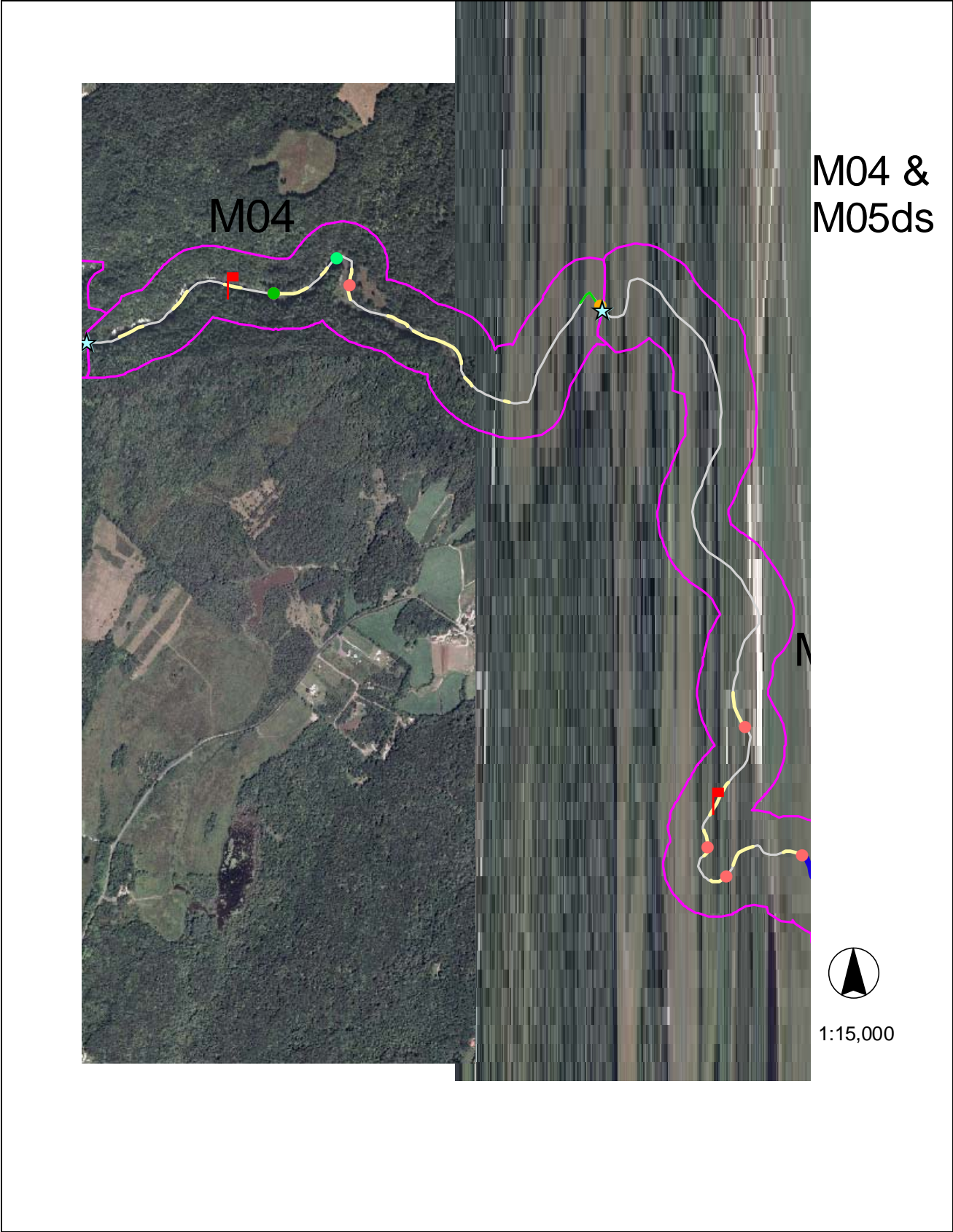


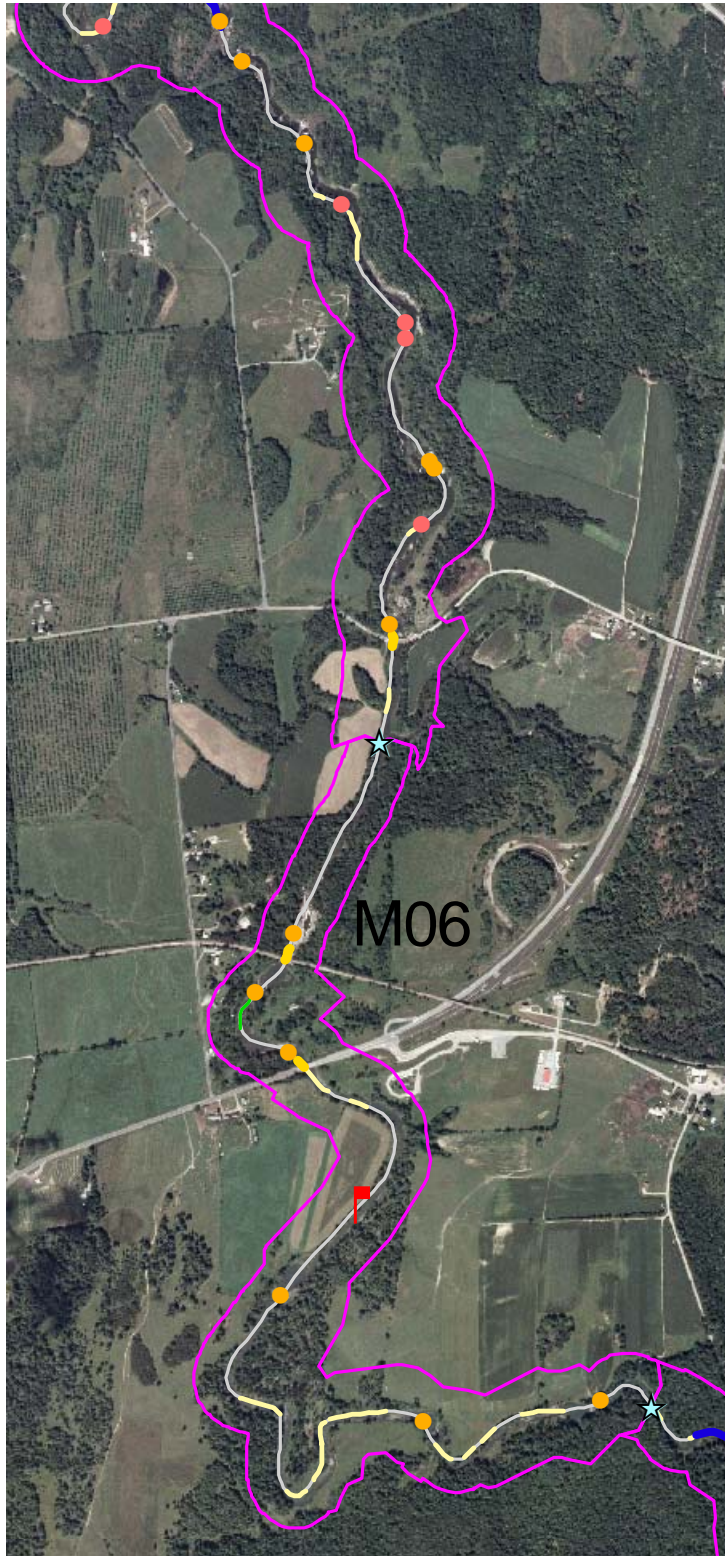
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M02 & M03



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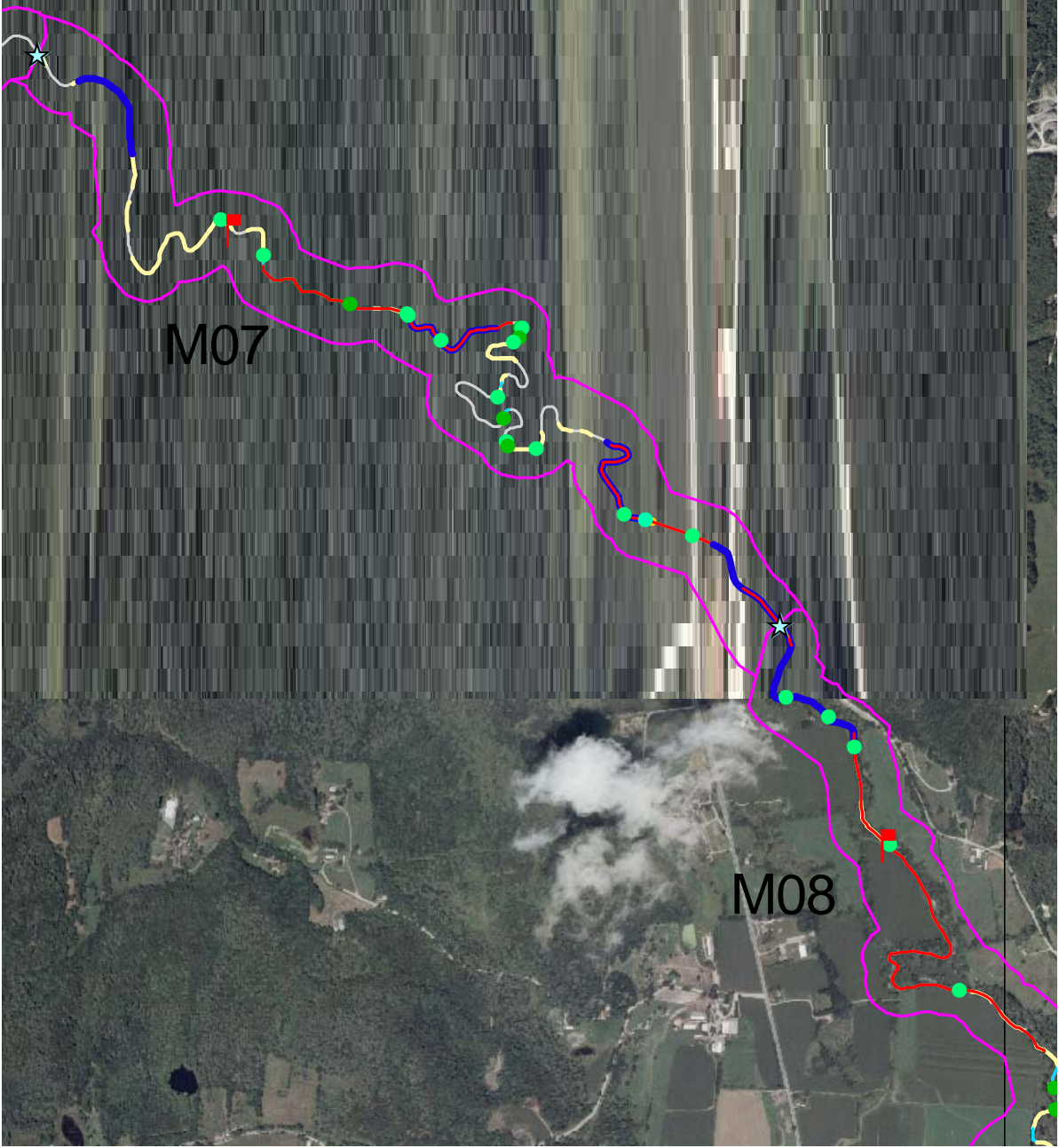


M05us
& M06



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M07 &
M08ds

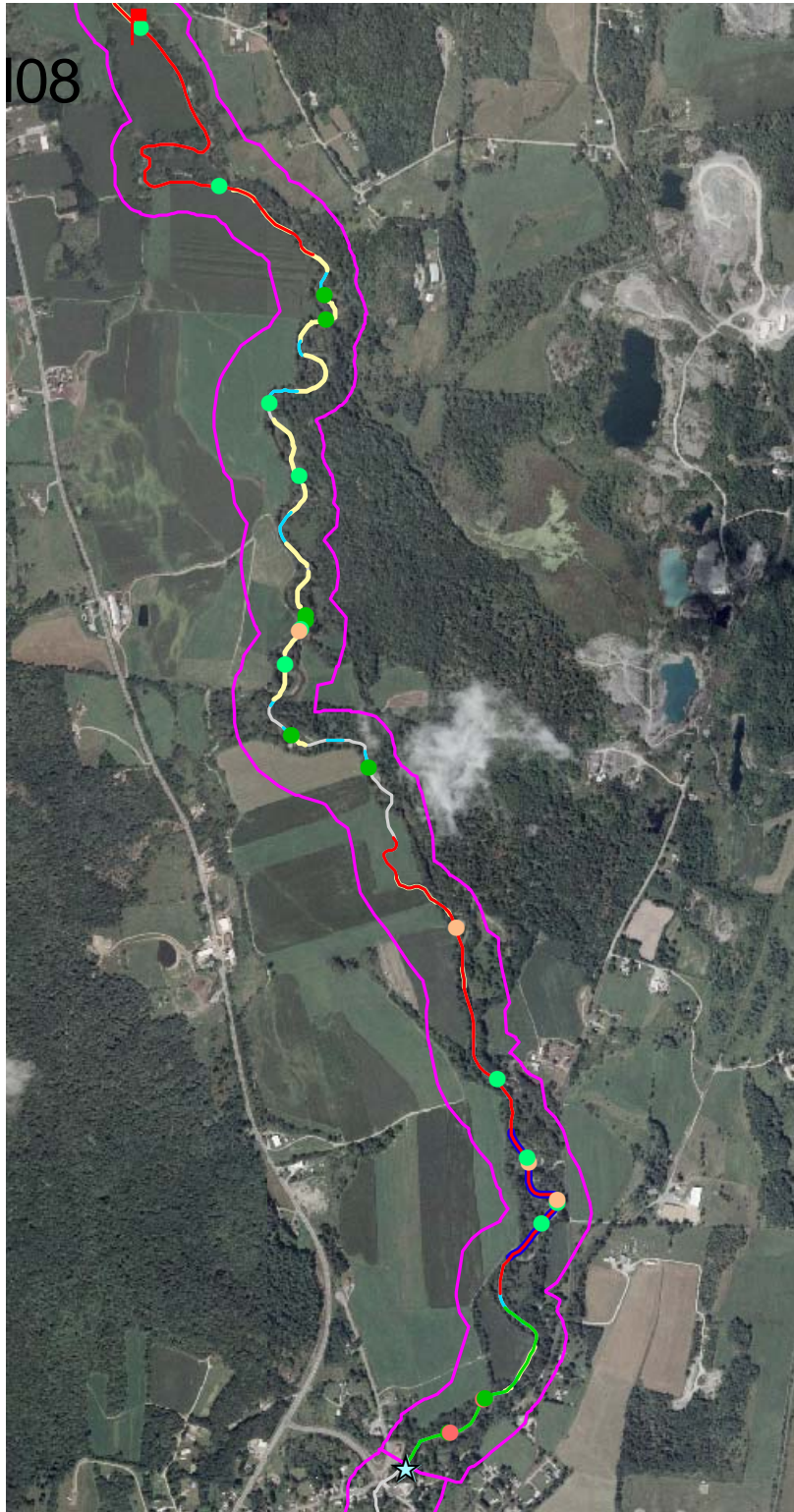


M07

M08

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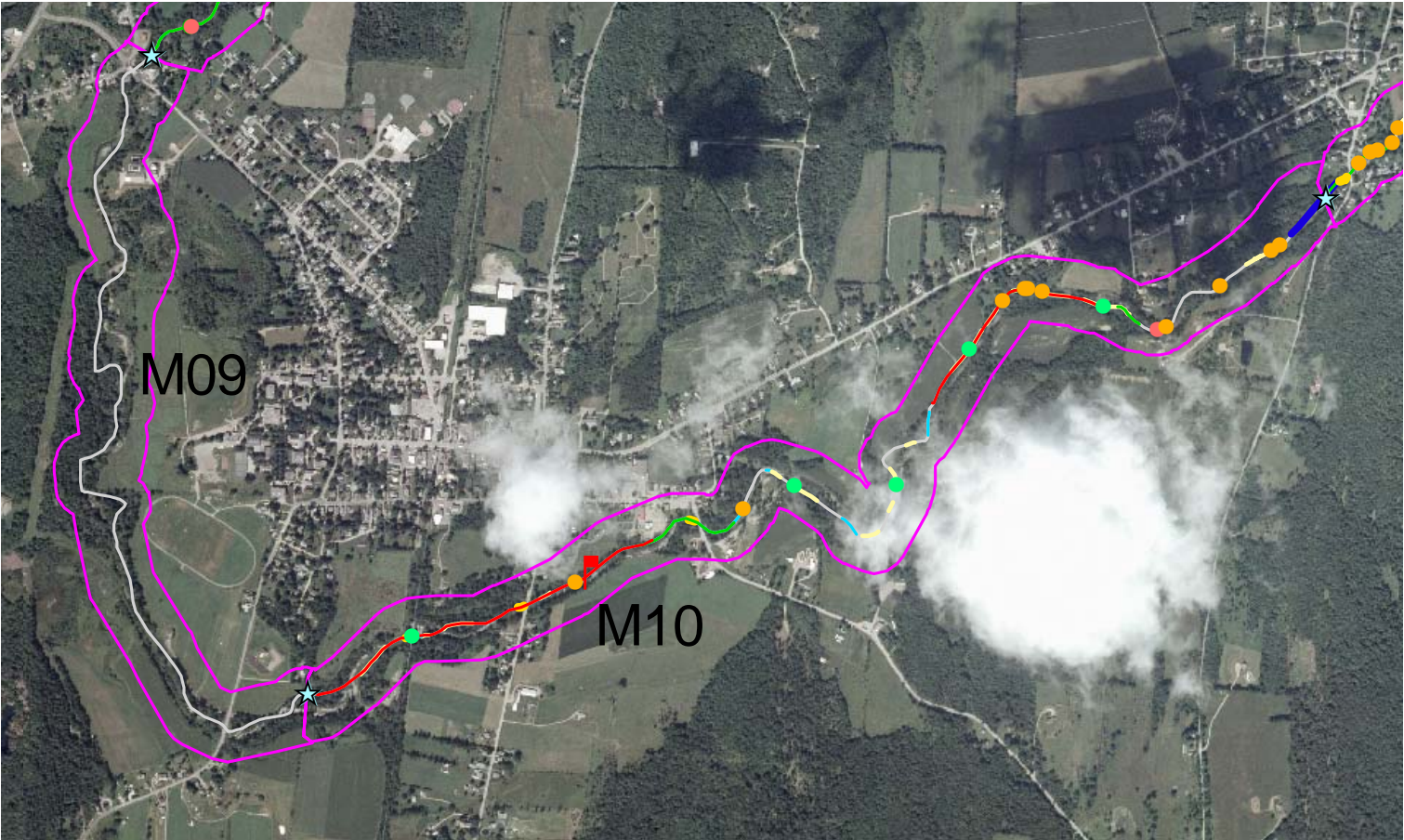
108

M08us



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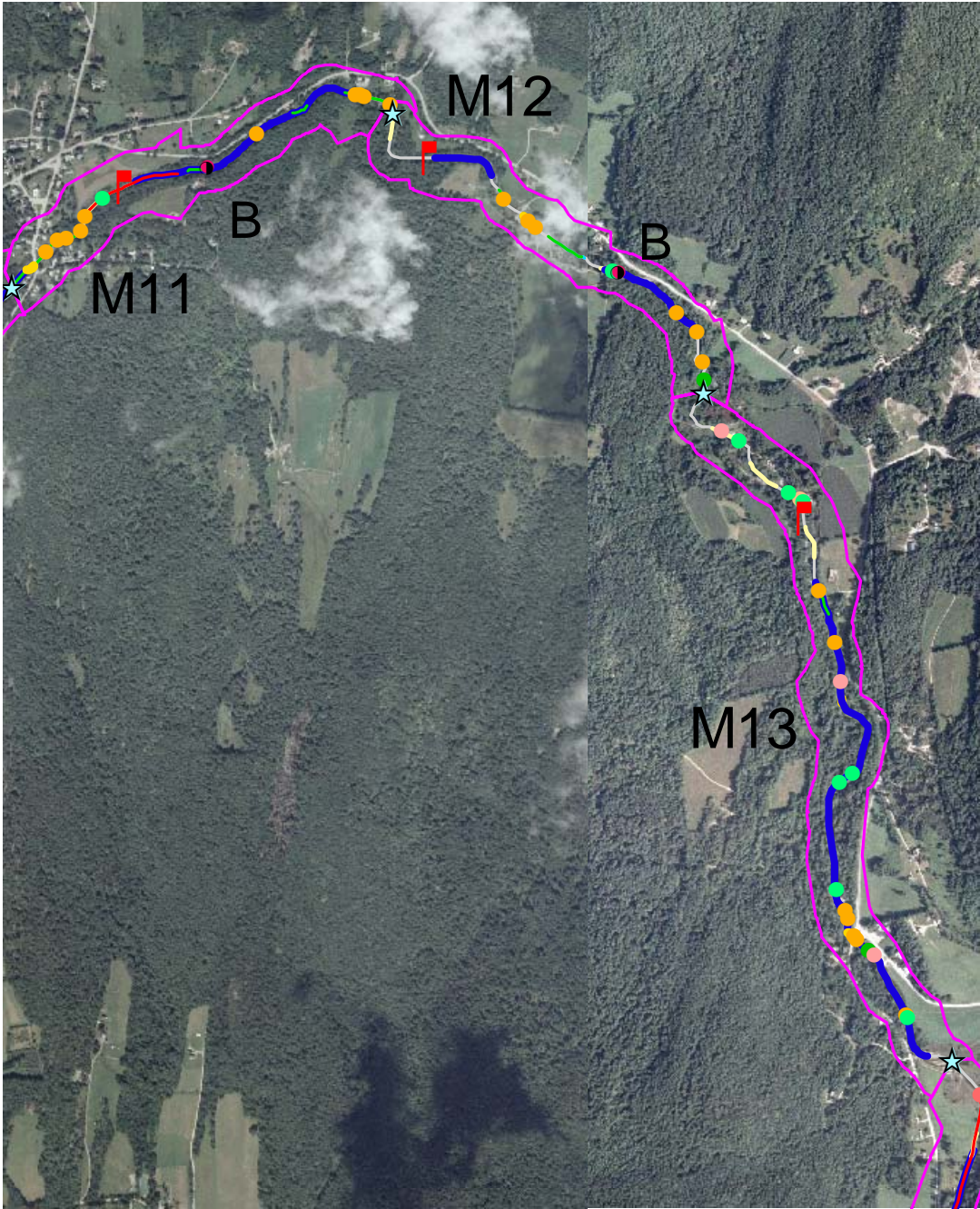
M09 & M10



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M11, M12, M13

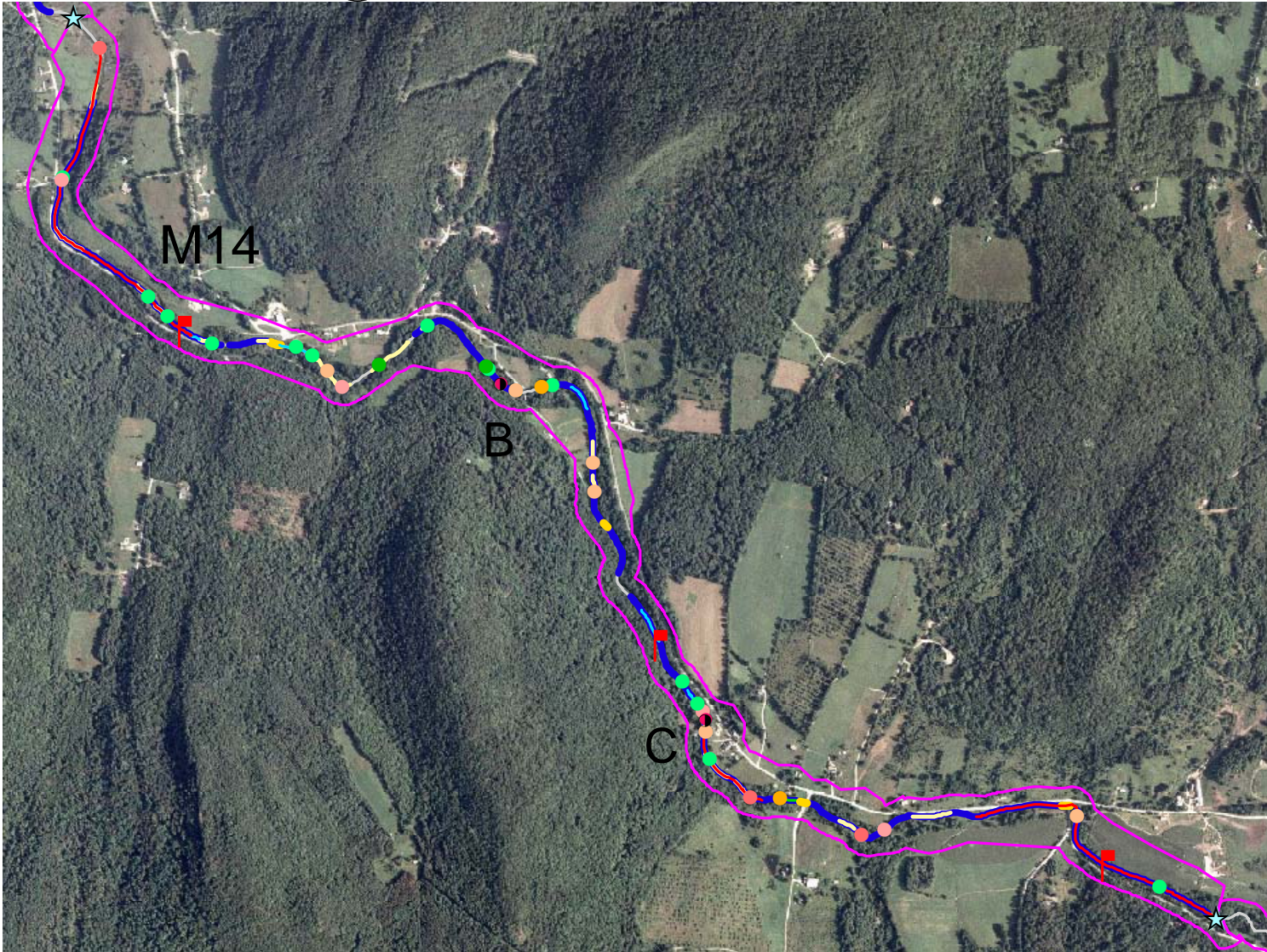


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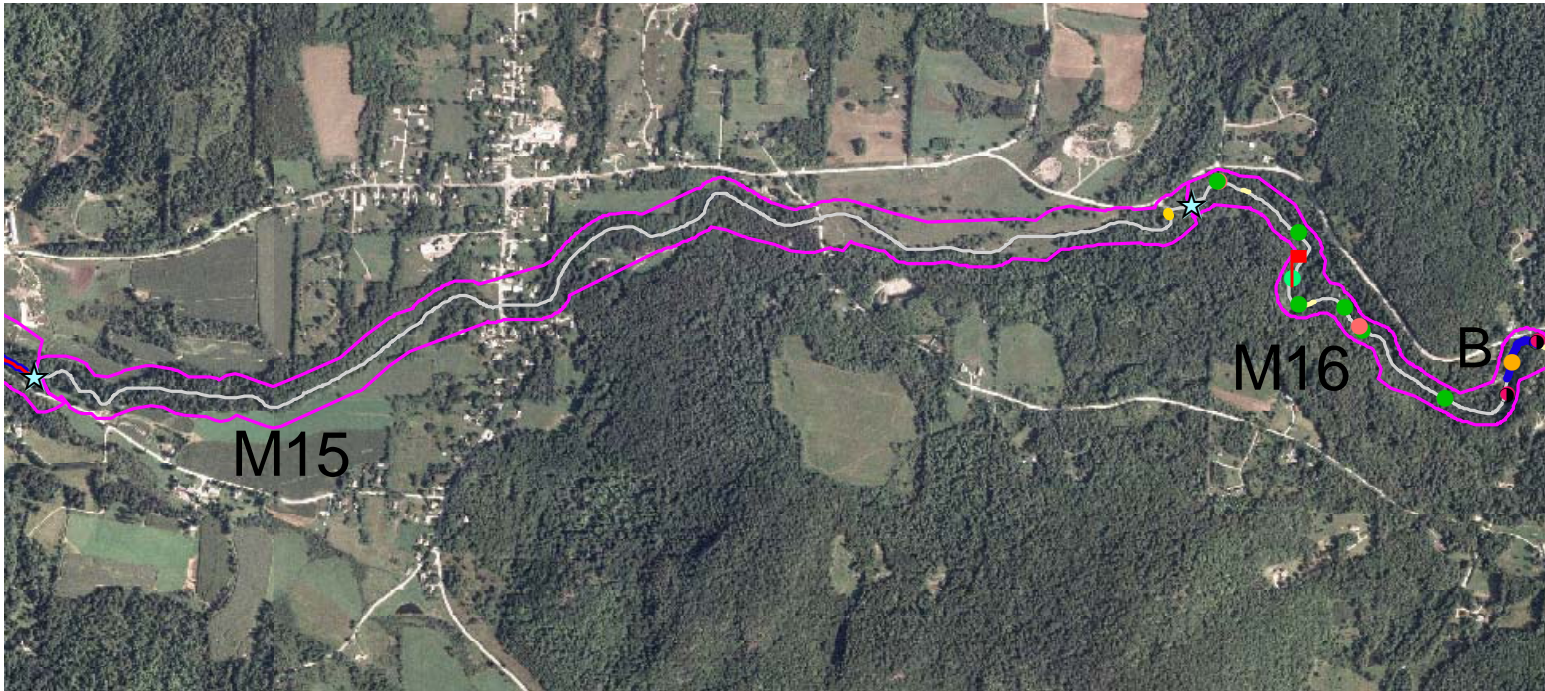


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M14



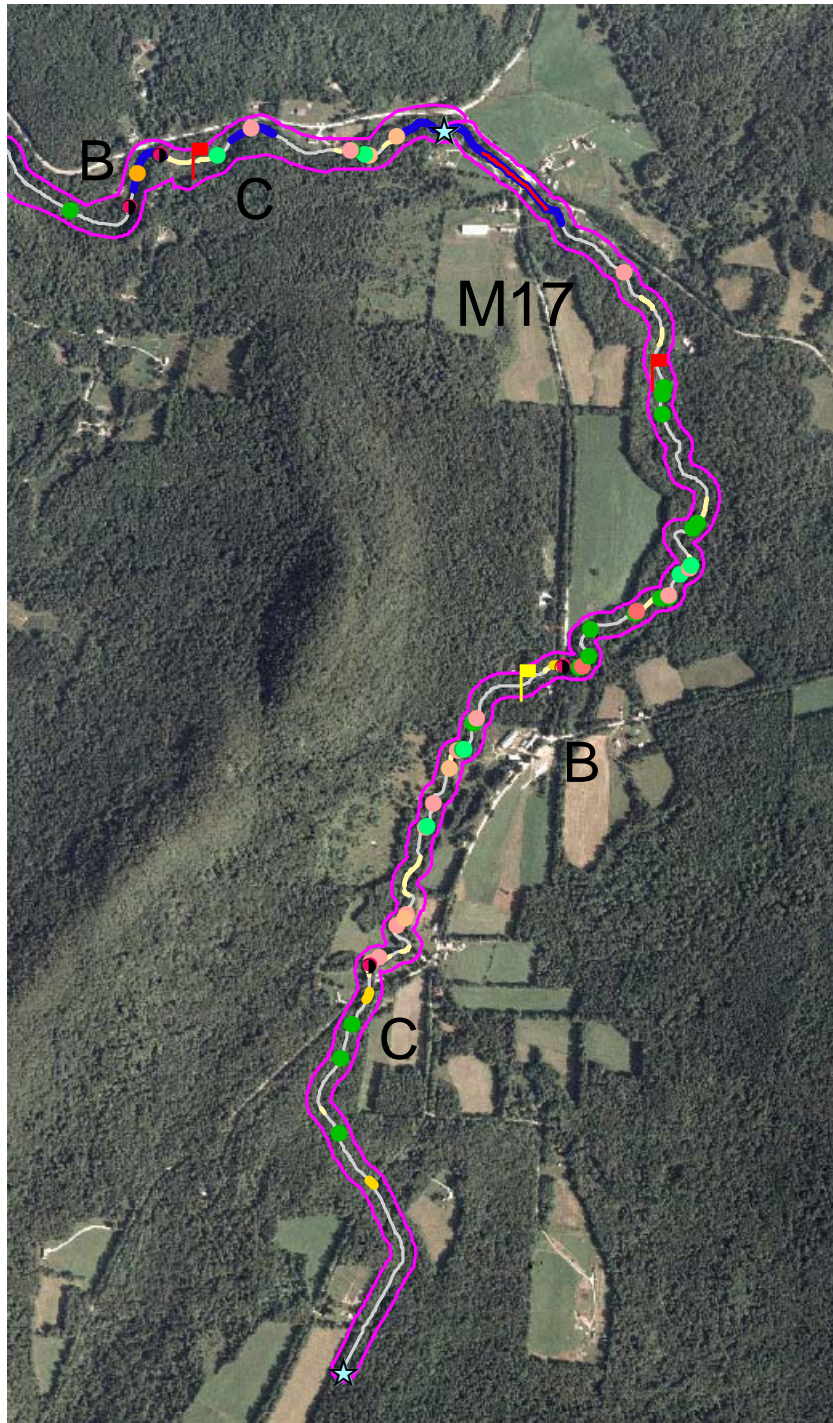
M15 & M16ds



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M16us & M17



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Appendix C - Reach Notes

Poultney River Mainstem

M02

Slow moving, mostly sandy bottom channel. Channel was likely straightened in the past to increase tillable land. Berms confine the channel on the right bank and the left bank is higher than the right in many areas, another sign that the channel may have been straightened and moved over to enlarge fields. A road runs along the right bank for most of the reach, downstream of Book Rd and the bridge. Very high diversity of fish species here, several fishermen were seen and one commented that he always catches something different. The valley here is fairly narrow. Restoration of floodplain access on the right bank and increased meandering could be good restoration projects. The berm could be removed and the road relocated to the toe of the right valley side slope.

Reach M02 appeared to be a C Dune-Ripple stream type with sandy bed substrate. The reach appeared incised, although not entrenched and had floodplain access at high flows and at small breaks in the berm. The reach appeared to be in “Fair” condition and in stage II of the F-stage channel evolution process and stream sensitivity to disturbance was “Very High.”

Habitat condition was “Fair” and appeared to be affected by channel straightening, reduced riparian buffer, bank instability, and little mix of substrate types for epifaunal colonization and fish cover. The reach had some adjacent wetland areas and habitat could be improved through projects mentioned above. Japanese knotweed was not observed in this reach.

One bridge at Book Road constricted the bankfull width. No problems were noted.

M04

A dam at the upstream end controls this reach. The dam holds water upstream, at the lower section of reach M05. The reach is in a Semi-confined valley setting with “Very Steep” side slopes. There did not appear to be any road access to the channel in this reach, although a cable car and some sort of data transmittal station were noted. No encroachments (development, roads, berms) were observed.

The reach appeared to have experienced a stream type departure from a B type to an F Plane Bed. Identifying bankfull indicators in this reach was difficult, due to the altered hydrology from the dam. An increase in fine gravel and sand was noted, likely from bank failures and tributary rejuvenation. Riffles had likely been eroded and then were accumulating fine sediment.

RGA condition appeared to be “Poor” with entrenchment (stream type departure) and flow alterations from the dam the main factors affecting geomorphic condition. Sediment supply was likely reduced by the dam, however 3 mass failures and rejuvenating tributaries were contributors to sediment load. Pools were limited and filled with sediment. Overall, the reach appeared to be in stage III of the F-stage channel evolution process. However, depending on dam operations, the channel could be set back to stage II with further incision from excess flows or sediment reduction.

Habitat appeared to be “Fair” condition. “Embeddedness” received a “Poor” rating (gravel, cobble and boulder particles more than 75% surrounded by fine sediment). Riffle and step frequency was also “Poor” as was bank stability. Bank vegetation and riparian buffer width were considered “Reference.” Japanese knotweed was not observed in this reach.

Dam removal is not likely an option here, but regulation of flows in such a way that they do not create excessively high flows of “hungry water” could help limit incision and tributary rejuvenation. More investigation into the dam operations is needed.

M05

Reach M05 was in a semi-confined valley with hilly to steep side slopes. Many bedrock ledges provided grade control. Multiple mass failures (9) were observed, adding fine sediment to the reach. Bed composition was a mix of ledges and riffles with large substrate, then large pools and runs. A dam at the downstream end caused ponding upstream. Water in this area moved more slowly and the bed substrate was finer, although some bedrock was exposed.

Riparian buffer vegetation was mostly deciduous with some areas of shrub-sapling vegetation. Buffer width was greater than 100 feet, although some areas buffer width was 50-100 feet. 258 feet of road encroached into the stream corridor in this reach.

RGA condition appeared to be “Good” and the stream appeared to be in stage IV of the F-stage evolution process. The channel appeared to have incised in the past and now had minor widening, aggradation, and planform adjustments.

Habitat also appeared to be in “Good” condition. Bank stability was “Fair” due to the many mass failures present. Embeddedness was also “Fair” and a “Fair” mix of epifaunal substrate and cover was noted. Japanese knotweed was not observed in this reach.

One bridge constricts the channel toward the upstream end of the reach.

The steep slopes leading down to the river valley have likely kept development and encroachments out of the corridor. Protection of this unencumbered corridor is important.

M06

Reach M06 had relatively slow moving water with several ledges and falls providing grade control and slope change. Dominant buffer width was 5-25 feet on the left bank and greater than 100 feet on the right bank. Riparian corridor land use was crop and hay on the left and forest with some pasture on the right bank.

RGA condition was “Good” and the reach appeared to be in stage IV of the F-stage channel evolution process. The channel appeared to have slightly incised in the past and now had minor planform and widening adjustments.

RHA condition appeared “Good.” During the assessment, deer, muskrat, mergansers, and turkey were seen. Field assistant caught 6 trout in this reach. Factors affecting habitat condition included a “Fair” mix of substrates, some sediment deposition, reduced channel sinuosity, bank instability and lack of riparian buffer on the left bank. Japanese knotweed was not observed in this reach.

Two bridges were present, one for the new Route 4, which constricted the floodprone width and one for a railroad, which constricted the bankfull width.

Planting of riparian buffer vegetation and allowing the channel room to complete planform adjustments could improve stream condition.

M07

Reach M07 appeared to have had some channel straightening in the past. More recent straightening was done for Route 22A, however this area has begun to meander again. Water in the channel was slow moving and deep and the stream type was E Ripple-Dune. The width to depth ratio measured in the cross section indicated a C type channel, but a terrace and flood chute were included in the cross section, so the E type was given.

RGA condition appeared to be in “Poor” condition due to the extreme planform adjustments occurring in the reach. Minor widening was also an adjustment process. The channel appeared slightly incised. The reach appeared to be in stage IV of the F-stage channel evolution process. Stream sensitivity was “Very High.”

Habitat condition for M07 was “Fair.” Bank instability and limited riparian buffer width (5-25 feet) were the main factors affecting habitat condition. Japanese knotweed was observed in the upper section of the reach.

Two old abutments constricted the channel width and one bridge (Route 22A) constricted the floodprone width.

M08

Reach M08 ran along one edge of a very broad valley and appeared to have been significantly straightened in the past, with continued straightening and riprap evident. Japanese knotweed was observed all along the reach and taking GPS points was not practical. One sick fish and one dead fish were seen and the field assistant who fished the reach had no bites. Riparian buffer was 26-50 feet of deciduous and herbaceous species.

RGA condition appeared to be “Fair” with historical degradation likely related to channel straightening. Current adjustments appeared to be planform, aggradation, and minor localized widening. Riprap was limiting channel migration to the left bank. Channel evolution stage appeared to be IV F. Sensitivity to disturbance was “Very High.”

Habitat appeared to be in “Fair” condition. The main factors affecting habitat condition were sediment deposition and embeddedness, channel alteration, bank instability, and limited riparian buffer width.

M10

Reach M10 flows from East Poultney along the southern edge of the Town of Poultney. Several bedrock ledges provide grade control. Riparian buffer was 26-50 feet of deciduous trees.

Aggradation of fine gravel and sand was noted. The reach appeared to be in stage III of the F-stage evolution process with dominant adjustments being aggradation. The reach appeared to have been

straightened in the past, which may have contributed to the incision seen in the cross section measurements. Signs of minor widening and planform adjustments were also observed.

Habitat condition appeared to be “Fair.” Factors affecting habitat were sediment deposition and embedded substrate, and reduced riparian buffer width. Japanese knotweed was noted in several places in the reach.

Planting more woody buffer species is a potential project. Protection of the stream corridor could help limit placing future investments and infrastructure in the corridor and associated potential future conflicts.

M11

Reach M11 was segmented with a gorge in Segment B.

Segment A

Segment A appeared to be a C4 Riffle-Pool stream type, although pools were mostly filled with sediment and the riffle areas were very shallow. The segment was incised but retained floodplain access. The segment may have been dredged or straightened in the past, but signs of these activities were weak. One bridge constricted the bankfull width toward the downstream end of the segment.

The RHA indicated the habitat to be in “Fair” condition. The bed and banks had “Poor” mix of substrates and cover types. Sediment deposition and embeddedness were also rated as “Poor.” Riffle frequency was “Fair” and banks and buffers were mostly vegetated, although the right bank had riparian buffer width of less than 5 feet.

The RGA indicated the segment to be in “Fair” condition. The segment appeared to have incised historically, and now showed signs of widening and aggradation, with much fine sediment. The segment appeared to be in stage III of the F-stage evolution process.

Segment B

Segment B encompassed a gorge with very steep side slopes comprised of bedrock. Bank vegetation was comprised of coniferous and deciduous trees. Left bank buffer width was greater than 100 feet and right bank buffer width was 26-50 feet. A delta bar was noted at the confluence with Finel Hollow Brook.

M12

Segment A

Segment A was in an area of mostly herbaceous vegetation and fields. The segment may have been straightened in the past to improve the fields. Banks were composed of sandy material. The segment was a C4 Riffle-Pool type, although the pools were sedimented.

RHA condition was “Fair” and was affected by having few substrate types, sediment deposition and embeddedness, and limited riparian buffer width.

RGA condition was “Good.” Major aggradation was the dominant adjustment process, with minor widening and planform adjustments evident. The segment appeared to be in stage III of the F-stage evolution process.

Segment B

Segment B was a gorge with steep, bedrock side slopes. A nice swimming hole was at the downstream end with a small parking area on the road. Bank and buffer vegetation was mixed deciduous and coniferous trees. Riparian corridors were forested, although the road was in the right bank corridor.

M13

This reach was characterized by sections of gorges with deep pools alternating with wide, relatively flat run areas. Pools in these areas were mostly filled with fine sediment. The downstream section of this reach appears to be an important sediment attenuation zone with large deposits, braiding, and a good buffer in most areas. More trees could be planted in this area, but corridor protection is most important here.

The RHA condition appeared “Fair.” Sediment deposition and embeddedness of bed particles affected condition. Also, right bank riparian buffer was only 5-25 feet wide in some places.

RGA condition was also “Fair.” The reach appeared to have incised historically from an earlier terrace. A new lower terrace and floodplain had developed. Dominant adjustments were aggradation and planform. The reach appeared to be in stage IV of the F-stage evolution process and sensitivity was “Very High.”

M14

Segment A

Segment A runs through a flatter valley and appeared to have been straightened. The segment was confined by the road on the left bank in some areas. Most notably, at the downstream end of the segment was a gravel hill on the right bank. The stream had migrated over to the base of the hill and was eroding the gravel. This appeared to be a large sediment source and extreme aggradation, large bars and braiding were observed directly downstream.

The segment appeared to be a C4 Riffle-Pool type in “Fair” condition. Dominant adjustment processes were aggradation and planform. The segment appeared to be in stage IV of the F-stage evolution process. Identification of bankfull elevation was difficult in this segment due to straightening and bank modifications for residential and agricultural purposes. A small flood chute was identified on the right bank and the far side of that was used for bankfull.

Habitat was also assessed in “Fair” condition. Loss of adequate riparian buffer width and increased sediment deposition were the main factors affecting habitat condition. Other contributing factors were channel straightening and lack of mix of substrate types.

Segment B

Segment B was in a narrower valley, confined by the valley wall on the left bank and the road on the right bank. Some areas of the segment were wider with some floodplain area, but overall the segment appeared confined.

Stream type for this segment was F4 Plane Bed, representing a stream type departure from B (considered reference for this segment). The current adjustment process appeared to be aggradation following historical degradation and widening. The segment appeared to be in stage III of the F-stage evolution process.

Habitat condition appeared “Good.” Sediment deposition, few substrate types, low channel flow, and channel alteration were the main contributors. Riparian buffer was narrow on the right bank and some areas of bank erosion were noted.

Segment C

Segment C also appeared to have experienced a stream type departure from a C type to an F4c Riffle-Pool. This segment appeared to have been straightened for agriculture and the roads. Roads encroach into the stream corridor along either the right or left bank. Riparian buffer width was only 5-25 feet and comprised of deciduous trees and herbaceous species.

Dominant adjustment processes appeared to be widening and minor aggradation, following historical degradation. The segment appeared to be in stage III of the F-stage evolution process and in “Fair” condition.

Habitat appeared to be in “Fair” condition. Lack of riparian buffer, especially on the right bank, sediment deposition, and bank instability were the main factors affecting habitat condition. Few substrate types were present and gravel and boulder particles were somewhat embedded.

M16

Segment A

This segment was downstream of a waterfall segment. It appeared to be a C4 Plane Bed stream type. The segment had a good buffer of mixed trees. The channel is up against the bedrock valley wall in some places. Sediment deposits were noted upstream of boulders and debris jams. The segment appeared overwidened with multiple islands. This segment appeared to have less bank erosion than Segment C. This segment may have a Plane Bed stream type by reference, rather than the Step-Pool described in Phase 1. Multiple mass failures were observed.

Overall, the segment appeared to be in “Good” condition and “In Regime.” Signs of minor widening, aggradation and planform were noted. Stream sensitivity to disturbance was “High.”

Habitat was assessed in “Good” condition. Some areas of bank erosion were noted. Sediment deposition did affect habitat condition and led to moderate embeddedness of bed substrate.

Recommendations here were to protect the corridor, reduce sediment inputs, and reduce the trash in the stream.

Segment B

Segment B encompassed a gorge with a waterfall with an estimated height of 60 feet. Valley side slopes were very steep bedrock. Buffer width was good with coniferous and deciduous trees. An old bridge abutment was at the upstream end of the segment.

Segment C

Segment C appeared to be an important sediment attenuation area. The segment had alternating large point bars and erosion of outside banks and multiple flood chutes. Aggradation and planform appeared to be the dominant adjustment processes. The segment appeared to be in “Fair” condition and in stage IV of the F-stage evolution process. Sensitivity to disturbance was “Very High.”

Habitat in this segment appeared to be in “Good” condition. Riparian buffer was good with deciduous trees and some coniferous trees and shrubs/saplings. Sediment deposition appeared to affect habitat condition and reduced the channel flow status. Bank erosion was another main factor affecting habitat condition.

Buffer protection was recommended for this reach to preserve the attenuation functions at work here.

M17

Segment A

Segment A appeared to be a B4 Step-Pool stream type. Riffles were sedimented. Buffer was good and comprised of mixed trees. Multiple mass failures were noted. One culvert constricted the channel at the upstream end of the segment.

The RGA indicated the segment appeared to be in “Good” condition and “In Regime,” with only minor aggradation and planform adjustments. The sensitivity to disturbance was “Moderate.”

Habitat condition for Segment A was “Good.” Some bank erosion and sediment deposition affected condition and embeddedness and flow status.

Segment B

Segment B also appeared to be a B4 Step-Pool stream type. Riffles were sedimented. Buffer was fairly good and comprised of mixed trees. This segment may have been straightened in the past, but indicators were weak.

The RGA indicated the segment appeared to be in “Good” condition and “In Regime,” with minor widening, aggradation and planform adjustments. The sensitivity to disturbance was “Moderate.”

Habitat appeared to be in “Good” condition. Factors affecting habitat were reduced riparian buffer and bank vegetative protection on the right bank, sediment deposition, and low channel flow status.

Recommendations included bank and buffer planting and buffer protection.

Appendix D – Project Table Notes

M01

Some riprap in areas and lack of riparian buffer vegetation in areas.

M02

Without the berm at the cross section location, incision ratio would be 1.6, down from 1.9 with the berm. No recently abandoned channel to recapture as restoration. No development or improved road, but a dirt farm road on right bank. Check for landowner willingness.

M03

Affected by increased sediment from M04 and tributary rejuvenation. Watershed location is sensitive to deposition. Reach is straightened and incised, no recently abandoned channel to recapture, no fixed constraints. Potential land use constraints include farming. Potential flow and sediment alterations from M04 and the dam may inhibit active restoration. This could be a potential restoration/protection project with additional information needed.

M04

Increase in stream power from reduced sediment supply at the dam, not likely to be addressed in the next 5 years. So use BMPs here and investigate reducing or mitigating dam effects.

M05

Replace the bridge, but not the dam. Stabilize stream banks refers to multiple mass failures. Protect river corridor to allow for adjustments related to the dam.

M06

Reach is adjusting laterally, remove or replace rail bridge

M07

Reach in Stage IV, near V. Assuming lack of riparian vegetation is contributing to increased migration. Reach is in a watershed area with high deposition so bank stabilization projects not recommended. Remove derelict bridge abutment, this may help to alleviate migration pressures upstream and may induce more meandering downstream.

M08

Farming is a land use constraint to restoration. Landowner not likely to consider corridor protection, so defer action on passive restoration and riprap removal until landowner is ready to protect corridor. Some abandoned channels (if not filled in) may be available for restoration. Knotweed all along reach, is there a removal program? So Potential Restoration/Protection Project here with additional information needed.

M09A

Protecting the river corridor here is important to alleviate pressures from upstream. This segment may not adjust to an equilibrium condition if upstream areas are not addressed. Restore incised reach through protecting the corridor and allowing for passive restoration. Removal of rip-rap could help the segment reach equilibrium.

M09B

Remove the berm if adjacent land use is compatible with more frequent flooding (information needed). Is the rail grade still used? Could it be removed or moved? Or, protect the downstream river corridor as a high priority to mitigate for this segment.

M10

Replace structure at the rail trail, and protect the corridor. Restore Incised Reach through River Corridor Protection and gather information on additional landowners interested in corridor protection. Monitor sites near roads and buildings for any bank stabilization necessary to protect those investments.

M11A

Check for landowner willingness to protect the corridor to restore the incised reach. If sediment supply issues can be addressed upstream (M13-14) then Protect the River Corridor and Plant Stream Buffers.

M12A

If sediment can be addressed upstream (M13-14) then Plant Stream Buffers.

M13

Addressing the upstream sediment supply (M14) is important for this reach to achieve equilibrium and is recommended before actions take place here. A small berm on the left bank could be removed so it does not become a sediment source as the reach works toward equilibrium. Replace the bridge and protect the corridor to allow for passive restoration and to protect this attenuation area. A recently abandoned channel at the cross section location could be recaptured as a restoration measure.

M14A

Widen bridge, making sure houses would not be affected by #22. Stabilize bank to reduce sediment from gravel hill. Increase sediment transport through sharp bend if sediment can be attenuated downstream.

M14B

Road occupies most of the north valley. Some areas have about 50 feet of floodplain area. Likely to remain a transport reach unless more floodplain could be gained on the left bank, some bedrock is present so confining the segment. So #35 – high priority to protect the river corridor of the downstream reach.

M14C

Protect River Corridor, replace structures. Landowner willingness unknown. Unknown if sediment supply is high enough to restore equilibrium (meanders). If landowner willing, (39). LWD could be added to catch sediment and induce meanders.

M15

Stabilize stream bank if erosion is within 50 feet of road or building (10). If not, stabilize stream bank and plant buffer to arrest lateral movement and achieve long-term stability. Replace or remove structures (bridge and old abutment). Address upstream sediment supplies. Protect river corridor to allow for increased meanders post straightening.

M16A

In regime, corridor undeveloped. Possibly remove abutment from M16B to improve sediment continuity.

M16B

Possibly remove abutment from M16B to improve sediment continuity.

M16C

Protect river corridor. Plant buffer vegetation or let vegetation return.

M17A

Protect river corridor. Replace culvert to accommodate bankfull flow. Possibly increased peak flows from clearing and roads contributing to bank instability and increased sediment load.

M17B

Possibly clearing and reduced riparian vegetation are leading to bank instability. Protect river corridor, plant stream buffers, and stabilize stream banks. No to 11, replace structure is low priority. Proceed with BMPs until sediment supply is identified (bank erosion from upstream? – off SGAT) and addressed possibly through stabilizing stream banks.

Appendix E – Phase 2 Database Reports

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Field Geology Services**
 Segment Length (ft): **31,718**

Phase 2 Segment Summary
 Reach # **M01**
 Observers: **J Field/ A. Patmos**
 Segment Location: **West Haven. In Ward Marsh area.**

page 1 of 2
 Segment: **0**
 Why Not assessed:

November 30, 2006
 Completion Date: **June 1, 2005**
 FIT: **No**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Very Steep	
Continuous w/	Never	Never	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Bedrock	Bedrock	
<u>1.5 Valley Features</u>			
Valley Width (ft)	2,273		
Width Determination			
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Flows through marsh area on both sides of channel- tributary fans in valley may control position of meanders. Lake level fluctuations may lead to minor tributary rejuvenation but the rejuvenation is not indicative of widespread incision or instabilities.

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width	115	
2.2 Max Depth (ft)	7.90	
2.3 Mean Depth (ft)	5.40	
2.4 Floodprone Width (ft)	500	
2.5 Aband. Floodpln	7.90	
2.6 Width/Depth Ratio	21.30	
2.7 Entrenchment Ratio	4.35	
2.8 Incision Ratio	1.00	
2.9 Sinuosity	Moderate	
2.10 Riffles Type	Complete	
2.11 Riffle/Step Spacing (ft)	495	
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	0 %	
Coarse Gravel	0 %	
Fine Gravel	10 %	
Sand	90 %	
Silt/Clay Present?	Yes	
Detritus	0 %	
# Large Woody	8	
<u>2.13 Average Largest Particle on</u>		
Bed	16.0	mm
Bar	0.0	mm
<u>2.14 Stream Type</u>		
Stream Type:	C	
Bed Material:	Sand	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	0	0	
Erosion Height (ft)	0.00	0.00	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	282	4,189	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Bare	Bare	
Sub-dominant	Herbaceous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	51-75	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	51-100	51-100	
Sub-dominant	5-25	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	Hay	Hay	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	26.67	
Gullies		0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Abundant		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	24		
4.5 Impoundments	Large		
Impoundmt. Location	Upstream		
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow	Run-of-river		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	2	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
11	0	4	1
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
17	0	Yes	
5.4 Stream Ford or Animal Yes			
5.5 Straightening Yes			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M02** Segment: **0**
 Observers: **LG, TG** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **July 11, 2006**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
	Berms	5,857	0
	Roads	8,866	0
	Railroads	0	0
	Improved Paths	0	0
	Development	0	0
<u>1.4 Adjacent Side</u>			
		<u>Left</u>	<u>Right</u>
	Hillside Slope	Steep	Steep
	Continuous w/	Sometimes	Sometimes
	W/in 1 Bankfill	Sometimes	Sometimes
	Texture	Not Evalua	Not Evalua
<u>1.5 Valley Features</u>			
	Valley Width (ft)	797	
	Width Determination	Estimated	
	Confinement Type	Broad	
	Rock Gorge?	No	
	Human-caused changed valley width?	No	

Notes:

<u>Step 2. Stream Channel</u>	
2.1 Bankfull Width	97
2.2 Max Depth (ft)	6.50
2.3 Mean Depth (ft)	5.50
2.4 Floodprone Width (ft)	306
2.5 Aband. Floodpln	12.50
2.6 Width/Depth Ratio	17.64
2.7 Entrenchment Ratio	3.15
2.8 Incision Ratio	1.92
2.9 Sinuosity	Low
2.10 Riffles Type	Not
2.11 Riffle/Step Spacing (ft)	N/A
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	0 %
Cobble	0 %
Coarse Gravel	2 %
Fine Gravel	10 %
Sand	88 %
Silt/Clay Present?	Yes
Detritus	0 %
# Large Woody	39
<u>2.13 Average Largest Particle on</u>	
Bed	N/A
Bar	N/A
<u>2.14 Stream Type</u>	
Stream Type:	C
Bed Material:	Sand
Subclass Slope:	None
Bed Form:	Dune-Ripple
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

<u>Step 3. Riparian Features</u>		
<u>3.1 Stream Banks</u>		
Typical Bank Slope Steep		
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Silt/Clay	Silt/Clay
Consistency	Cohesive	Cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	1,306	915
Erosion Height (ft)	17.86	14.00
Revetmt. Type	None	Rip-Rap
Revetmt. Length (ft)	0	591
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Herbaceous	Herbaceous
Sub-dominant	Deciduous	Deciduous
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	26-50	26-50
Mid-Channel Canopy	Open	
<u>3.2 Riparian Buffer</u>		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	5-25	5-25
Sub-dominant	None	None
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Deciduous
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin
<u>3.3 Riparian Corridor</u>		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Pasture	Crop
Sub-dominant	None	None
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	One	40.00
Gullies	None	0.00

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Abundant		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	0		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	1	1
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	1	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	Yes	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
Yes			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Field Geology Services**
 Segment Length (ft): **6,308**

Phase 2 Segment Summary page 1 of 2
 Reach # **M03** Segment: **0**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **Upstream of Hubbardton confluence on old sod farm owned by TNC**

November 30, 2006
 Completion Date: **May 31, 2005**
 FIT: **No**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	
Roads	0	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Extremely	
Continuous w/	Never	Never	
W/in 1 Bankfill	Never	Sometimes	
Texture	Sand	Sand	
<u>1.5 Valley Features</u>			
Valley Width (ft)	986		
Width Determination			
Confinement Type	Narrow		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Cross section repeated for four years.
 Channel evolution complete after incision through 14 feet of post-European settlement deposits

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width		83
2.2 Max Depth (ft)		7.90
2.3 Mean Depth (ft)		5.70
2.4 Floodprone Width (ft)		350
2.5 Aband. Floodpln		12.10
2.6 Width/Depth Ratio		14.56
2.7 Entrenchment Ratio		4.22
2.8 Incision Ratio		1.53
2.9 Sinuosity		High
2.10 Riffles Type	Sedimented	
2.11 Riffle/Step Spacing (ft)		574
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	0 %	
Coarse Gravel	0 %	
Fine Gravel	0 %	
Sand	100 %	
Silt/Clay Present?	Yes	
Detritus	0 %	
# Large Woody	3	
<u>2.13 Average Largest Particle on</u>		
Bed	2.0	mm
Bar	0.0	mm
<u>2.14 Stream Type</u>		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Undercut			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	1,712	3,070	
Erosion Height (ft)	12.00	12.00	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Bare	Bare	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	1-25	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	51-100	5-25	
Sub-dominant	>100	<5	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous Shrubs/Saplin		
Sub-dominant	Deciduous	Deciduous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Hay	
Sub-dominant	Hay	Forest	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies		0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Low		
4.4 # of Debris Jams	0		
4.5 Impoundments	Large		
Impoundmt. Location	Upstream		
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow	Run-of-river		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	1	2	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	1	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	Yes	
5.4 Stream Ford or Animal	No		
5.5 Straightening	Yes		
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M04** Segment: **0**
 Observers: **LG, TG** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **July 11, 2006**
 Rain: **No**

Step 1. Valley and Floodplain			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	313	0	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Very Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
	<u>Texture</u>	<u>Sand</u>	<u>Sand</u>
<u>1.5 Valley Features</u>			
Valley Width (ft)	205		
Width Determination			
Confinement Type	Semi-confined		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Step 2. Stream Channel	
2.1 Bankfull Width	80
2.2 Max Depth (ft)	5.40
2.3 Mean Depth (ft)	4.07
2.4 Floodprone Width (ft)	92
2.5 Aband. Floodpln	10.10
2.6 Width/Depth Ratio	19.53
2.7 Entrenchment Ratio	1.15
2.8 Incision Ratio	1.87
2.9 Sinuosity	Low
2.10 Riffles Type	Not
2.11 Riffle/Step Spacing (ft)	N/A
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	0 %
Cobble	0 %
Coarse Gravel	8 %
Fine Gravel	25 %
Sand	67 %
<u>2.13 Average Largest Particle on</u>	
Bed	N/A
Bar	N/A
<u>2.14 Stream Type</u>	
Stream Type:	F
Bed Material:	Sand
Subclass Slope:	None
Bed Form:	Plane Bed
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

Step 3. Riparian Features			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Sand	Silt/Clay	
Consistency	Cohesive	Cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	1,322	1,532	
Erosion Height (ft)	27.14	9.60	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	51-75	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	>100	
Sub-dominant	None	None	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Mixed Trees	Mixed Trees	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	None	None	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	70.00	
Gullies	None	0.00	

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps	Abundant		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	1		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	0	3
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	1	4	2
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	Yes	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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.			

Notes:

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M05** Segment: **0**
 Observers: **LG, TG** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **July 10, 2006**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	
Roads	258	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	370		
Width Determination	Measured		
Confinement Type	Semi-confined		
Rock Gorge?	No		
Human-caused changed valley width?	No		

<u>Step 2. Stream Channel</u>	
2.1 Bankfull Width	91
2.2 Max Depth (ft)	4.90
2.3 Mean Depth (ft)	3.55
2.4 Floodprone Width (ft)	370
2.5 Aband. Floodpln	7.10
2.6 Width/Depth Ratio	25.63
2.7 Entrenchment Ratio	4.07
2.8 Incision Ratio	1.45
2.9 Sinuosity	Moderate
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	1,000
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	0 %
Cobble	16 %
Coarse Gravel	29 %
Fine Gravel	13 %
Sand	42 %
<u>2.13 Average Largest Particle on</u>	
Bed	N/A
Bar	N/A
<u>2.14 Stream Type</u>	
Stream Type:	C
Bed Material:	Cobble
Subclass Slope:	None
Bed Form:	Riffle-Pool
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope	Moderate		
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Silt/Clay	Silt/Clay	
Consistency	Cohesive	Cohesive	
Lower			
Material Type	Mix	Mix	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	1,464	1,302	
Erosion Height (ft)	9.43	14.40	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Herbaceous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	26-50	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	>100	
Sub-dominant	51-100	51-100	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	None	None	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	26.88	
Gullies	None	0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	0		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	4	5	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	1
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	Yes	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M06** Segment: **0**
 Observers: **LG, TG** Why Not assessed:

November 30, 2006
 Completion Date: **July 7, 2006**
 FIT: **Yes**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	260	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Flat	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	455		
Width Determination	Measured		
Confinement Type	Narrow		
Rock Gorge?	No		
Human-caused changed valley width?	No		

<u>Step 2. Stream Channel</u>	
2.1 Bankfull Width	83
2.2 Max Depth (ft)	6.80
2.3 Mean Depth (ft)	5.56
2.4 Floodprone Width (ft)	455
2.5 Aband. Floodpln	8.30
2.6 Width/Depth Ratio	14.93
2.7 Entrenchment Ratio	5.48
2.8 Incision Ratio	1.22
2.9 Sinuosity	Moderate
2.10 Riffles Type	Not
2.11 Riffle/Step Spacing (ft)	N/A
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	0 %
Cobble	0 %
Coarse Gravel	0 %
Fine Gravel	0 %
Sand	100 %
<u>2.13 Average Largest Particle on</u>	
Bed	N/A
Bar	N/A
<u>2.14 Stream Type</u>	
Stream Type:	C
Bed Material:	Sand
Subclass Slope:	None
Bed Form:	Riffle-Pool
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope	Undercut		
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Silt/Clay	Silt/Clay	
Consistency	Cohesive	Cohesive	
Lower			
Material Type	Silt/Clay	Silt/Clay	
Consistency	Cohesive	Cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	1,692	1,019	
Erosion Height (ft)	6.50	7.83	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Deciduous	
Sub-dominant	Deciduous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	26-50	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	5-25	>100	
Sub-dominant	>100	51-100	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Mixed Trees	Deciduous	
Sub-dominant	Mixed Trees	Deciduous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Crop	Forest	
Sub-dominant	Forest	Pasture	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies	None	0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	0		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	4	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	1	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	Yes	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M07** Segment: **0**
 Observers: **LG, TG** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **July 7, 2006**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	4,217	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	747	0	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	1,993		
Width Determination	Estimated		
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

<u>Step 2. Stream Channel</u>	
2.1 Bankfull Width	74
2.2 Max Depth (ft)	4.60
2.3 Mean Depth (ft)	2.93
2.4 Floodprone Width (ft)	440
2.5 Aband. Floodpln	6.30
2.6 Width/Depth Ratio	25.36
2.7 Entrenchment Ratio	5.92
2.8 Incision Ratio	1.37
2.9 Sinuosity	High
2.10 Riffles Type	Not
2.11 Riffle/Step Spacing (ft)	N/A
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	0 %
Cobble	0 %
Coarse Gravel	0 %
Fine Gravel	15 %
Sand	85 %
<u>2.13 Average Largest Particle on</u>	
Bed	N/A
Bar	N/A
<u>2.14 Stream Type</u>	
Stream Type:	E
Bed Material:	Sand
Subclass Slope:	None
Bed Form:	Dune-Ripple
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Sand	Silt/Clay	
Consistency	Cohesive	Cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	3,298	3,600	
Erosion Height (ft)	6.11	6.24	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	1,066	552	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Deciduous	Deciduous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	1-25	1-25	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	5-25	5-25	
Sub-dominant	>100	>100	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Deciduous	Deciduous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Hay	Hay	
Sub-dominant	Forest	Forest	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies	None	0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	6		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	1		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	12	1
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
7	4	1	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal No			
5.5 Straightening Yes			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M08** Segment: **0**
 Observers: **LG, TG** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 25, 2006**
 Rain: **Yes**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	
Roads	3,182	0	
Railroads	0	0	
Improved Paths	0	0	
Development	1,970	0	
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Flat	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	880		
Width Determination	Measured		
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	Yes		

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width		80
2.2 Max Depth (ft)		3.90
2.3 Mean Depth (ft)		2.27
2.4 Floodprone Width (ft)		880
2.5 Aband. Floodpln		4.90
2.6 Width/Depth Ratio		35.24
2.7 Entrenchment Ratio		11.00
2.8 Incision Ratio		1.26
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		700
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	0 %	
Coarse Gravel	9 %	
Fine Gravel	20 %	
Sand	71 %	
<u>2.13 Average Largest Particle on</u>		
Bed	2.0	inches
Bar	2.0	inches
<u>2.14 Stream Type</u>		
Stream Type:	C	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Silt/Clay	Silt/Clay	
Consistency	Cohesive	Cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	3,522	3,725	
Erosion Height (ft)	5.47	5.57	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	4,792	1,158	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Deciduous	
Sub-dominant	Deciduous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	51-75	
Mid-Channel Canopy		Open	
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	26-50	26-50	
Sub-dominant	>100	>100	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Herbaceous	None	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Crop		
Sub-dominant			
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	22.50	
Gullies	None	0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps			Some
4.2 Adjacent Wetlands			Some
4.3 Flow Status			Moderate
4.4 # of Debris Jams			8
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs			0
4.7 Upstream Flow			
4.9 # of Beaver Dams			0
Affected Length (ft) 0			
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	17	26	5
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	1
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
12	0	0	1
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>		<u>Trib Rejuv.</u>
0	0		No
5.4 Stream Ford or Animal Yes			
5.5 Straightening Yes			
5.5 Dredging None			

Notes:

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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Field Geology Services**
 Segment Length (ft): **7,704**

Phase 2 Segment Summary page 1 of 2
 Reach # **M09** Segment: **A**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **GMC land past wastewater treatment facility in village of Poultney.**

November 30, 2006 **FIT: No**
 Completion Date: **June 1, 2005**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>	
Berms	0	0	
Roads	0	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Steep	
Continuous w/	Sometimes	Never	
W/in 1 Bankfill	Sometimes	Never	
Texture	Boulder	Gravel	
1.5 Valley Features			
Valley Width (ft)	3,050		
Width Determination			
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Glacial lake clay at base of banks and possible post European sediment deposition and artificial fill in upper bank, very active depositional area. Minor bedrock constraints throughout including at bridge at downstream end so no channel adjustments observed at bridge.

Step 2. Stream Channel		
2.1 Bankfull Width		43
2.2 Max Depth (ft)		3.30
2.3 Mean Depth (ft)		3.10
2.4 Floodprone Width (ft)		5,200
2.5 Aband. Floodpln		4.00
2.6 Width/Depth Ratio		13.87
2.7 Entrenchment Ratio		120.93
2.8 Incision Ratio		1.21
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		266
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	0 %	
Cobble	24 %	
Coarse Gravel	45 %	
Fine Gravel	21 %	
Sand	10 %	
2.13 Average Largest Particle on		
Bed	147.0	mm
Bar	0.0	mm
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	1,186	351	
Erosion Height (ft)	5.00	5.00	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	514	472	
Near Bank Veg. Type			
	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
Bank Canopy			
	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	26-50	
Mid-Channel Canopy			
Open			
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	51-100	51-100	
Sub-dominant	<5	<5	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Hay	Hay	
Sub-dominant	Forest	Forest	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies		0.00	

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps			Some
4.2 Adjacent Wetlands			Some
4.3 Flow Status			Low
4.4 # of Debris Jams			2
4.5 Impoundments			None
Impoundmt. Location			
4.6 # of Stormwater Inputs			2
4.7 Upstream Flow			None
4.9 # of Beaver Dams			0
Affected Length (ft)			0
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	2	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	1
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	0	2	2
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>		<u>Trib Rejuv.</u>
2	0		No
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
Yes			
5.5 Dredging Dredging, Gravel 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.			

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Field Geology Services**
 Segment Length (ft): **3,058**

Phase 2 Segment Summary page 1 of 2
 Reach # **M09** Segment: **B**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **On GMC property, downstream of bridge.**

November 30, 2006 **FIT: No**
 Completion Date: **June 1, 2005**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>	
Berms	0	0	
Roads	0	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
1.4 Adjacent Side	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Flat	
Continuous w/	Sometimes	Never	
W/in 1 Bankfill	Sometimes	Never	
Texture	Cobble	Cobble	
1.5 Valley Features			
Valley Width (ft)	5,592		
Width Determination			
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Railroad grade on left bank armored with large slate slabs. Also berming on right bank. Straightened channel that has been unable to fully adjust with aggradation and planform changes as in Segment A because of bank armoring.

<u>Step 2. Stream Channel</u>	
2.1 Bankfull Width	42
2.2 Max Depth (ft)	3.30
2.3 Mean Depth (ft)	3.10
2.4 Floodprone Width (ft)	5,200
2.5 Aband. Floodpln	6.00
2.6 Width/Depth Ratio	13.55
2.7 Entrenchment Ratio	123.81
2.8 Incision Ratio	1.82
2.9 Sinuosity	Low
2.10 Riffles Type	Sedimented
2.11 Riffle/Step Spacing (ft)	220
2.12 Substrate Composition	
Bedrock	0 %
Boulder	3 %
Cobble	39 %
Coarse Gravel	37 %
Fine Gravel	15 %
Sand	6 %
Silt/Clay Present?	Yes
Detritus	0 %
# Large Woody	1
2.13 Average Largest Particle on	
Bed	298.0 mm
Bar	0.0 mm
2.14 Stream Type	
Stream Type:	C
Bed Material:	Gravel
Subclass Slope:	c
Bed Form:	Riffle-Pool
2.15 Reference Stream Type	
(if different from Phase 1)	

<u>Step 3. Riparian Features</u>		
3.1 Stream Banks		
Typical Bank Slope Steep		
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type		
Consistency		
Lower		
Material Type		
Consistency		
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	876	0
Erosion Height (ft)	6.00	0.00
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	1,198	561
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Herbaceous	Herbaceous
Sub-dominant	Deciduous	Deciduous
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	0	26-50
Mid-Channel Canopy	Open	
3.2 Riparian Buffer		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	<5	26-50
Sub-dominant	5-25	>100
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Herbaceous
Sub-dominant	Deciduous	Herbaceous
3.3 Riparian Corridor		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Hay	Hay
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures		0.00
Gullies		0.00

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	None		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Low		
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		
<u>Step 5. Channel Bed and Planform Changes</u>			
5.1 Bar Types			
<u>Mid</u>	<u>Point</u>	<u>Side</u>	
2	0	1	
<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>	
2	0	0	
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	0	1
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
1	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
Yes			
5.5 Dredging Dredging, Gravel 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.			

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M10** Segment: **0**
 Observers: **LG, SH, HS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 22, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	428	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	1,660	0	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Flat	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	3,116		
Width Determination	Estimated		
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Step 2. Stream Channel		
2.1 Bankfull Width		67
2.2 Max Depth (ft)		4.10
2.3 Mean Depth (ft)		2.95
2.4 Floodprone Width (ft)		83
2.5 Aband. Floodpln		7.60
2.6 Width/Depth Ratio		22.71
2.7 Entrenchment Ratio		1.24
2.8 Incision Ratio		1.85
2.9 Sinuosity		Low
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		1,000
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	3 %	
Coarse Gravel	30 %	
Fine Gravel	35 %	
Sand	32 %	
<u>2.13 Average Largest Particle on</u>		
Bed	2.5	inches
Bar	2.5	inches
<u>2.14 Stream Type</u>		
Stream Type:	F	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

Step 3. Riparian Features			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Mix	Mix	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	1,290	2,248	
Erosion Height (ft)	4.20	5.09	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	1,223	621	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Herbaceous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	51-75	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	26-50	26-50	
Sub-dominant	5-25	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	None	None	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant			
Sub-dominant			
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	One	15.00	
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			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	3	13	6
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	6	0	3
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
5	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal No			
5.5 Straightening Yes			
5.5 Dredging None			

Notes:

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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M11** Segment: **A**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 20, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation Channel Dimensions			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>	
Berms	0	0	
Roads	879	0	
Railroads	0	0	
Improved Paths	0	0	
Development	149	850	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Flat	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
1.5 Valley Features			
Valley Width (ft)	500		
Width Determination	Estimated		
Confinement Type	Narrow		
Rock Gorge?	No		
Human-caused changed valley width?	Yes		

Notes:
 Bridge is over gorge at ds end, so not a channel constriction or floodprone constriction. Possibly old straightening or dredging.

Step 2. Stream Channel	
2.1 Bankfull Width	91
2.2 Max Depth (ft)	3.80
2.3 Mean Depth (ft)	2.52
2.4 Floodprone Width (ft)	386
2.5 Aband. Floodpln	7.80
2.6 Width/Depth Ratio	36.20
2.7 Entrenchment Ratio	4.23
2.8 Incision Ratio	2.05
2.9 Sinuosity	Low
2.10 Riffles Type	Not
2.11 Riffle/Step Spacing (ft)	N/A
2.12 Substrate Composition	
Bedrock	0 %
Boulder	1 %
Cobble	8 %
Coarse Gravel	20 %
Fine Gravel	25 %
Sand	46 %
Silt/Clay Present?	Yes
Detritus	1 %
# Large Woody	5
2.13 Average Largest Particle on	
Bed	N/A
Bar	N/A
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	Moderate	
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	98	199
Erosion Height (ft)	4.00	4.00
Revetmt. Type	None	Rip-Rap
Revetmt. Length (ft)	0	168
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Herbaceous
Sub-dominant	None	Deciduous
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	51-75	1-25
Mid-Channel Canopy	Open	
3.2 Riparian Buffer		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	>100	<5
Sub-dominant	5-25	5-25
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Herbaceous	Deciduous
Sub-dominant	None	Deciduous
3.3 Riparian Corridor		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Forest	Hay
Sub-dominant	None	Residential
	<u>Amount</u>	<u>Mean Height</u>
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			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	1	1	1
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
Yes			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M11** Segment: **B**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 20, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain		
1.1 Segmentation <u>Grade Controls</u>		
1.2 Alluvial Fan	No	
1.3 Corridor Encroachments		
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0
Roads	1,598	0
Railroads	0	0
Improved Paths	0	0
Development	553	0
1.4 Adjacent Side		
	<u>Left</u>	<u>Right</u>
Hillside Slope	Very Steep	Extremely
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Always	Always
Texture	Bedrock	Bedrock
1.5 Valley Features		
Valley Width (ft)	0	
Width Determination		
Confinement Type	Narrowly	
Rock Gorge?	Yes	
Human-caused changed valley width?	No	

Step 2. Stream Channel	
2.1 Bankfull Width	0
2.2 Max Depth (ft)	0.00
2.3 Mean Depth (ft)	0.00
2.4 Floodprone Width (ft)	0
2.5 Aband. Floodpln	0.00
2.6 Width/Depth Ratio	0.00
2.7 Entrenchment Ratio	0.00
2.8 Incision Ratio	0.00
2.9 Sinuosity	
2.10 Riffles Type	
2.11 Riffle/Step Spacing (ft)	0
2.12 Substrate Composition	
Silt/Clay Present?	
Detritus	0 %
# Large Woody	0
2.13 Average Largest Particle on	
Bed	0.0
Bar	0.0
2.14 Stream Type	
Stream Type:	
Bed Material:	
Subclass Slope:	
Bed Form:	
2.15 Reference Stream Type	
(if different from Phase 1)	
A	1 Non Cascade

Step 3. Riparian Features		
3.1 Stream Banks		
Typical Bank Slope Steep		
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	137	0
Erosion Height (ft)	4.00	0.00
Revetmt. Type	None	Rip-Rap
Revetmt. Length (ft)	0	98
Near Bank Veg. Type		
Dominant	<u>Left</u>	<u>Right</u>
	Coniferous	Deciduous
Sub-dominant	Deciduous Shrubs/Saplin	
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	76-100	51-75
Mid-Channel Canopy	Open	
3.2 Riparian Buffer		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	>100	26-50
Sub-dominant	None	51-100
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Mixed Trees
Sub-dominant	None	None
3.3 Riparian Corridor		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Forest	Forest
Sub-dominant	None	Residential
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	None	0.00
Gullies	None	0.00

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps			
4.2 Adjacent Wetlands			
4.3 Flow Status			
4.4 # of Debris Jams	0		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
<u>Mid</u>	<u>Point</u>	<u>Side</u>	
0	0	2	
<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>	
0	0	1	
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M12** Segment: **A**
 Observers: **LG, HS, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 20, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation Planform and Scope			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>	
Berms	0	0	
Roads	700	0	
Railroads	0	0	
Improved Paths	0	0	
Development	468	0	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
1.5 Valley Features			
Valley Width (ft)	347		
Width Determination	Measured		
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Possibly some old straightening for fields.

Step 2. Stream Channel		
2.1 Bankfull Width		54
2.2 Max Depth (ft)		2.80
2.3 Mean Depth (ft)		2.14
2.4 Floodprone Width (ft)		347
2.5 Aband. Floodpln		2.80
2.6 Width/Depth Ratio		25.42
2.7 Entrenchment Ratio		6.38
2.8 Incision Ratio		1.00
2.9 Sinuosity		Low
2.10 Riffles Type	Sedimented	
2.11 Riffle/Step Spacing (ft)		500
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	2 %	
Cobble	12 %	
Coarse Gravel	19 %	
Fine Gravel	30 %	
Sand	37 %	
2.13 Average Largest Particle on		
Bed	13.0	inches
Bar	4.0	inches
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Moderate			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	53	244	
Erosion Height (ft)	6.00	3.00	
Revetmt. Type	Rip-Rap	None	
Revetmt. Length (ft)	171	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Deciduous	Deciduous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	51-75	
Mid-Channel Canopy	Open		
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	26-50	
Sub-dominant	<5	<5	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	None	None	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	Residential	Residential	
	<u>Amount</u>	<u>Mean Height</u>	
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			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	3	3	1
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	1	1	1
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M12** Segment: **B**
 Observers: **LG, HS, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 20, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation <u>Grade Controls</u>			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	936	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Always	Always	
Texture	Bedrock	Bedrock	
1.5 Valley Features			
Valley Width (ft)	0		
Width Determination			
Confinement Type	Narrowly		
Rock Gorge?	Yes		
Human-caused changed valley width?	No		

Notes:
 Gorge, nice swim hole.

Step 2. Stream Channel	
2.1 Bankfull Width	0
2.2 Max Depth (ft)	0.00
2.3 Mean Depth (ft)	0.00
2.4 Floodprone Width (ft)	0
2.5 Aband. Floodpln	0.00
2.6 Width/Depth Ratio	0.00
2.7 Entrenchment Ratio	0.00
2.8 Incision Ratio	0.00
2.9 Sinuosity	
2.10 Riffles Type	
2.11 Riffle/Step Spacing (ft)	0
2.12 Substrate Composition	
Silt/Clay Present?	
Detritus	0 %
# Large Woody	0
2.13 Average Largest Particle on	
Bed	0.0
Bar	0.0
2.14 Stream Type	
Stream Type:	
Bed Material:	
Subclass Slope:	
Bed Form:	
2.15 Reference Stream Type	
(if different from Phase 1)	
A	1 Non Cascade

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Bedrock	Bedrock	
Consistency	Cohesive	Cohesive	
Lower			
Material Type	Bedrock	Bedrock	
Consistency	Cohesive	Cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	49	0	
Erosion Height (ft)	3.00	0.00	
Revetmt. Type	None	Rip-Rap	
Revetmt. Length (ft)	0	251	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Coniferous	Deciduous	
Sub-dominant	Deciduous	None	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	76-100	76-100	
Mid-Channel Canopy	Open		
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	51-100	
Sub-dominant	None	<5	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Mixed Trees	
Sub-dominant	None	None	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	None	None	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies	None	0.00	

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps			
4.2 Adjacent Wetlands			
4.3 Flow Status			
4.4 # of Debris Jams	1		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	0	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M13** Segment: **0**
 Observers: **LG, HS** Why Not assessed:

November 30, 2006 **FIT: Yes**
 Completion Date: **July 17, 2006**
 Rain: **Yes**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation	None		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	145	0	
Roads	3,588	1,293	
Railroads	0	0	
Improved Paths	0	0	
Development	275	0	
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	550		
Width Determination	Measured		
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	Yes		

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width		76
2.2 Max Depth (ft)		2.70
2.3 Mean Depth (ft)		1.30
2.4 Floodprone Width (ft)		166
2.5 Aband. Floodpln		3.80
2.6 Width/Depth Ratio		58.15
2.7 Entrenchment Ratio		2.20
2.8 Incision Ratio		1.41
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		600
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	8 %	
Coarse Gravel	25 %	
Fine Gravel	26 %	
Sand	41 %	
<u>2.13 Average Largest Particle on</u>		
Bed	9.0	inches
Bar	5.0	inches
<u>2.14 Stream Type</u>		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope	Undercut		
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Silt/Clay	Silt/Clay	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Mix	Mix	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	465	1,499	
Erosion Height (ft)	3.80	4.71	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	718	179	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Deciduous	Deciduous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	26-50	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	5-25	
Sub-dominant	5-25	>100	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	None	Herbaceous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Crop	
Sub-dominant	None	Forest	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies	None	0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Abundant		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	1		
<u>4.5 Impoundments</u>			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
<u>4.7 Upstream Flow</u>			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	3	12	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	2
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
4	0	2	1
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
3	0	No	
<u>5.4 Stream Ford or Animal</u>			
Yes			
<u>5.5 Straightening</u>			
No			
<u>5.5 Dredging</u>			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M14** Segment: **A**
 Observers: **LG, HS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **July 17, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain		
1.1 Segmentation Depositional Features		
1.2 Alluvial Fan	No	
1.3 Corridor Encroachments		
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0
Roads	4,404	485
Railroads	0	0
Improved Paths	0	0
Development	0	0
1.4 Adjacent Side		
	<u>Left</u>	<u>Right</u>
Hillside Slope	Steep	Hilly
Continuous w/	Never	Sometimes
W/in 1 Bankfill	Sometimes	Sometimes
Texture	Not Evalua	Not Evalua
1.5 Valley Features		
Valley Width (ft)	550	
Width Determination	Measured	
Confinement Type	Very Broad	
Rock Gorge?	No	
Human-caused changed valley width?	Yes	

Step 2. Stream Channel		
2.1 Bankfull Width		46
2.2 Max Depth (ft)		2.90
2.3 Mean Depth (ft)		1.62
2.4 Floodprone Width (ft)		127
2.5 Aband. Floodpln		2.90
2.6 Width/Depth Ratio		28.40
2.7 Entrenchment Ratio		2.76
2.8 Incision Ratio		1.00
2.9 Sinuosity		Low
2.10 Riffles Type		Complete
2.11 Riffle/Step Spacing (ft)		300
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	7 %	
Cobble	19 %	
Coarse Gravel	23 %	
Fine Gravel	9 %	
Sand	42 %	
2.13 Average Largest Particle on		
Bed	N/A	inches
Bar	N/A	inches
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features		
3.1 Stream Banks		
Typical Bank Slope	Moderate	
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	1,275	837
Erosion Height (ft)	3.17	3.67
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	635	312
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Herbaceous
Sub-dominant	None	Deciduous
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	26-50	26-50
Mid-Channel Canopy	Open	
3.2 Riparian Buffer		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	5-25	5-25
Sub-dominant	None	None
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Herbaceous
Sub-dominant	Deciduous	Herbaceous
3.3 Riparian Corridor		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Pasture	Hay
Sub-dominant	Forest	Residential
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	One	15.00
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	2		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	7	6	3
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	1	0	3
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
7	0	0	1
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
2	0	No	
5.4 Stream Ford or Animal			
Yes			
5.5 Straightening			
Yes			
5.5 Dredging			
None			

Notes:

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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M14** Segment: **B**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 19, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation Grade Controls			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	
Roads	3,638	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
1.5 Valley Features			
Valley Width (ft)	127		
Width Determination	Measured		
Confinement Type	Semi-confined		
Rock Gorge?	No		
Human-caused changed valley width?	Yes		

Notes:
 Segment confined by valley wall (L) and road (R). Some areas with wider floodplain (50 ft), but cross section represents confined area.

Step 2. Stream Channel		
2.1 Bankfull Width		56
2.2 Max Depth (ft)		2.60
2.3 Mean Depth (ft)		1.97
2.4 Floodprone Width (ft)		73
2.5 Aband. Floodpln		9.50
2.6 Width/Depth Ratio		28.43
2.7 Entrenchment Ratio		1.30
2.8 Incision Ratio		3.65
2.9 Sinuosity		Low
2.10 Riffles Type		Complete
2.11 Riffle/Step Spacing (ft)		300
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	5 %	
Cobble	27 %	
Coarse Gravel	28 %	
Fine Gravel	15 %	
Sand	25 %	
Silt/Clay Present?	No	
Detritus	0 %	
# Large Woody	18	
2.13 Average Largest Particle on		
Bed	N/A	inches
Bar	N/A	inches
2.14 Stream Type		
Stream Type:	F	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Plane Bed	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Moderate			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Mix	Mix	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	199	197	
Erosion Height (ft)	4.50	4.00	
Revetmt. Type	None	Rip-Rap	
Revetmt. Length (ft)	0	789	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Coniferous	Deciduous	
Sub-dominant	Deciduous Shrubs/Saplin		
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	51-75	
Mid-Channel Canopy		Open	
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	51-100	
Sub-dominant	51-100	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Mixed Trees	
Sub-dominant	None	None	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	None	None	
	<u>Amount</u>	<u>Mean Height</u>	
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			
Impoundmt. Location			
4.6 # of Stormwater Inputs			0
4.7 Upstream Flow			
4.9 # of Beaver Dams			0
Affected Length (ft)			0
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	4	3
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	3	0	0
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	0	0	1
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>		<u>Trib Rejuv.</u>
1	0		No
5.4 Stream Ford or Animal			Yes
5.5 Straightening			No
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M14** Segment: **C**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 19, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation	Corridor Encroachment		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	4,644	1,264	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	620	0	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Hilly	
Continuous w/	Sometimes	Never	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	750		
Width Determination	Estimated		
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Step 2. Stream Channel	
2.1 Bankfull Width	52
2.2 Max Depth (ft)	2.50
2.3 Mean Depth (ft)	1.92
2.4 Floodprone Width (ft)	68
2.5 Aband. Floodpln	6.20
2.6 Width/Depth Ratio	26.82
2.7 Entrenchment Ratio	1.32
2.8 Incision Ratio	2.48
2.9 Sinuosity	Low
2.10 Riffles Type	Complete
2.11 Riffle/Step Spacing (ft)	500
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	2 %
Cobble	34 %
Coarse Gravel	27 %
Fine Gravel	14 %
Sand	23 %
Silt/Clay Present?	No
Detritus	0 %
# Large Woody	31
<u>2.13 Average Largest Particle on</u>	
Bed	N/A
Bar	N/A
<u>2.14 Stream Type</u>	
Stream Type:	F
Bed Material:	Gravel
Subclass Slope:	c
Bed Form:	Riffle-Pool
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

Step 3. Riparian Features		
<u>3.1 Stream Banks</u>		
Typical Bank Slope	Steep	
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Mix	Mix
Consistency	Non-cohesive	Non-cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	711	814
Erosion Height (ft)	3.67	3.33
Revetmt. Type	Rip-Rap	Rip-Rap
Revetmt. Length (ft)	265	436
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Deciduous
Sub-dominant	Herbaceous	Herbaceous
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	51-75	51-75
Mid-Channel Canopy	Open	
<u>3.2 Riparian Buffer</u>		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	5-25	5-25
Sub-dominant	51-100	51-100
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Deciduous
Sub-dominant	Herbaceous	Herbaceous
<u>3.3 Riparian Corridor</u>		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Crop	Crop
Sub-dominant	Forest	Residential
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	Multiple	26.00
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			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	5	5	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	1	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
1	0	No	
5.4 Stream Ford or Animal	Yes		
5.5 Straightening	Yes		
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Field Geology Services**
 Segment Length (ft): **10,989**

Phase 2 Segment Summary page 1 of 2
 Reach # **M15** Segment: **0**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **Middletown Springs, upstream of South Brook confluence.**

November 30, 2006
 Completion Date: **June 1, 2005**
 FIT: **Yes**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Cobble	Cobble	
<u>1.5 Valley Features</u>			
Valley Width (ft)	1,147		
Width Determination			
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Only minor straightening. Some bedrock controlled step-pool but otherwise largely pool riffle

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width		31
2.2 Max Depth (ft)		2.70
2.3 Mean Depth (ft)		1.90
2.4 Floodprone Width (ft)		108
2.5 Aband. Floodpln		2.70
2.6 Width/Depth Ratio		16.32
2.7 Entrenchment Ratio		3.48
2.8 Incision Ratio		1.00
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		144
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	4 %	
Cobble	26 %	
Coarse Gravel	49 %	
Fine Gravel	15 %	
Sand	6 %	
Silt/Clay Present? No		
Detritus	0 %	
# Large Woody	2	
<u>2.13 Average Largest Particle on</u>		
Bed	326.0	mm
Bar	0.0	mm
<u>2.14 Stream Type</u>		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Moderate			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	85	998	
Erosion Height (ft)	5.00	5.00	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type			
Dominant	<u>Left</u>	<u>Right</u>	
	Herbaceous	Herbaceous	
Sub-dominant	Shrubs/Saplin		
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	26-50	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	51-100	5-25	
Sub-dominant	>100	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Shrubs/Saplin	Herbaceous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Pasture	
Sub-dominant	Residential	Forest	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	One	35.00	
Gullies	None	0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Abundant		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Low		
4.4 # of Debris Jams	1		
4.5 Impoundments	None		
Impoundmt. Location			
4.6 # of Stormwater Inputs	2		
4.7 Upstream Flow	None		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	0	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	2
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
2	0	No	
5.4 Stream Ford or Animal No			
5.5 Straightening Yes			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M16** Segment: **A**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 13, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation Channel Dimensions			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	
Roads	0	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Extremely	Very Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Sand	Sand	
1.5 Valley Features			
Valley Width (ft)	203		
Width Determination	Measured		
Confinement Type	Narrow		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Step 2. Stream Channel		
2.1 Bankfull Width	46	
2.2 Max Depth (ft)	2.60	
2.3 Mean Depth (ft)	2.09	
2.4 Floodprone Width (ft)	203	
2.5 Aband. Floodpln	3.40	
2.6 Width/Depth Ratio	22.01	
2.7 Entrenchment Ratio	4.41	
2.8 Incision Ratio	1.31	
2.9 Sinuosity	Moderate	
2.10 Riffles Type	Sedimented	
2.11 Riffle/Step Spacing (ft)	200	
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	4 %	
Cobble	28 %	
Coarse Gravel	25 %	
Fine Gravel	23 %	
Sand	20 %	
2.13 Average Largest Particle on		
Bed	14.0	inches
Bar	5.0	inches
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Plane Bed	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Moderate			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Mix	Mix	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Boulder/Cobbl	Boulder/Cobbl	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	69	154	
Erosion Height (ft)	3.00	3.67	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Coniferous	Deciduous	
Sub-dominant	Deciduous	None	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	76-100	76-100	
Mid-Channel Canopy	Closed		
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	>100	
Sub-dominant	None	None	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Mixed Trees	Mixed Trees	
Sub-dominant	Deciduous	Coniferous	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	None	None	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	37.50	
Gullies	None	0.00	

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps	Abundant		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	6		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	3	0	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	3
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M16** Segment: **B**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 13, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain		
1.1 Segmentation <u>Grade Controls</u>		
1.2 Alluvial Fan	No	
1.3 Corridor Encroachments		
<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0
Roads	435	0
Railroads	0	0
Improved Paths	0	0
Development	0	0
1.4 Adjacent Side	<u>Left</u>	<u>Right</u>
Hillside Slope	Very Steep	Very Steep
Continuous w/	Always	Always
W/in 1 Bankfill	Always	Always
Texture	Bedrock	Bedrock
1.5 Valley Features		
Valley Width (ft)	0	
Width Determination		
Confinement Type	Narrowly	
Rock Gorge?	Yes	
Human-caused changed valley width?	No	

Step 2. Stream Channel	
2.1 Bankfull Width	0
2.2 Max Depth (ft)	0.00
2.3 Mean Depth (ft)	0.00
2.4 Floodprone Width (ft)	0
2.5 Aband. Floodpln	0.00
2.6 Width/Depth Ratio	0.00
2.7 Entrenchment Ratio	0.00
2.8 Incision Ratio	0.00
2.9 Sinuosity	
2.10 Riffles Type	
2.11 Riffle/Step Spacing (ft)	0
2.12 Substrate Composition	
Silt/Clay Present?	
Detritus	0 %
# Large Woody	0
2.13 Average Largest Particle on	
Bed	0.0
Bar	0.0
2.14 Stream Type	
Stream Type:	
Bed Material:	
Subclass Slope:	
Bed Form:	
2.15 Reference Stream Type	
(if different from Phase 1)	
A	1 Non Cascade

Step 3. Riparian Features		
3.1 Stream Banks		
Typical Bank Slope Steep		
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive
Lower		
Material Type	Bedrock	Bedrock
Consistency	Cohesive	Cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
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	<u>Left</u>	<u>Right</u>
Dominant	Coniferous	Deciduous
Sub-dominant	None	None
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	76-100	76-100
Mid-Channel Canopy	Closed	
3.2 Riparian Buffer		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	>100	51-100
Sub-dominant	None	None
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Coniferous
Sub-dominant	None	None
3.3 Riparian Corridor		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Forest	Forest
Sub-dominant	None	None
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	None	0.00
Gullies	None	0.00

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps			
4.2 Adjacent Wetlands			
4.3 Flow Status			
4.4 # of Debris Jams	0		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft) 0			
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
<u>Mid</u>	<u>Point</u>	<u>Side</u>	
0	0	0	
<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>	
0	0	0	
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal No			
5.5 Straightening No			
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M16** Segment: **C**
 Observers: **LG, MS** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 14, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation Channel Dimensions			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	235	0	
Roads	827	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
1.5 Valley Features			
Valley Width (ft)	262		
Width Determination	Measured		
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Step 2. Stream Channel		
2.1 Bankfull Width		31
2.2 Max Depth (ft)		2.70
2.3 Mean Depth (ft)		1.65
2.4 Floodprone Width (ft)		262
2.5 Aband. Floodpln		2.70
2.6 Width/Depth Ratio		18.73
2.7 Entrenchment Ratio		8.46
2.8 Incision Ratio		1.00
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		200
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	2 %	
Cobble	31 %	
Coarse Gravel	40 %	
Fine Gravel	9 %	
Sand	18 %	
2.13 Average Largest Particle on		
Bed	9.0	inches
Bar	5.0	inches
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Mix	Mix	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Gravel	Gravel	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	403	391	
Erosion Height (ft)	3.33	3.00	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	None	None	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	26-50	
Mid-Channel Canopy	Open		
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	>100	
Sub-dominant	None	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Deciduous	
Sub-dominant	Mixed Trees	Deciduous	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest Shrubs/Saplin		
Sub-dominant	None	Residential	
	<u>Amount</u>	<u>Mean Height</u>	
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			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	7	1
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	3	0	1
5.2 Other Features			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	1	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
2	0		
5.4 Stream Ford or Animal			
			Yes
5.5 Straightening			
			No
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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M17** Segment: **A**
 Observers: **LG, Lucas** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 12, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain		
1.1 Segmentation	Corridor Encroachment	
1.2 Alluvial Fan	No	
<u>1.3 Corridor Encroachments</u>		
	<u>Length (ft)</u>	<u>One</u> <u>Both</u>
Berms	0	0
Roads	1,319	0
Railroads	0	0
Improved Paths	0	0
Development	0	0
<u>1.4 Adjacent Side</u>		
	<u>Left</u>	<u>Right</u>
Hillside Slope	Very Steep	Very Steep
Continuous w/	Sometimes	Sometimes
W/in 1 Bankfill	Sometimes	Sometimes
	<u>Texture</u>	<u>Sand</u> <u>Sand</u>
<u>1.5 Valley Features</u>		
Valley Width (ft)	167	
Width Determination	Measured	
Confinement Type	Narrow	
Rock Gorge?	No	
Human-caused changed valley width?	No	

Step 2. Stream Channel		
2.1 Bankfull Width		31
2.2 Max Depth (ft)		4.00
2.3 Mean Depth (ft)		2.60
2.4 Floodprone Width (ft)		167
2.5 Aband. Floodpln		4.50
2.6 Width/Depth Ratio		11.73
2.7 Entrenchment Ratio		5.48
2.8 Incision Ratio		1.13
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		75
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	10 %	
Cobble	20 %	
Coarse Gravel	35 %	
Fine Gravel	13 %	
Sand	22 %	
<u>2.13 Average Largest Particle on</u>		
Bed	11.0	inches
Bar	3.5	inches
<u>2.14 Stream Type</u>		
Stream Type:	B	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Step-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

Step 3. Riparian Features		
<u>3.1 Stream Banks</u>		
Typical Bank Slope	Steep	
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Boulder/Cobbl	Boulder/Cobbl
Consistency	Non-cohesive	Non-cohesive
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	519	545
Erosion Height (ft)	5.25	4.33
Revetmt. Type	None	Rip-Rap
Revetmt. Length (ft)	0	138
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Deciduous	Deciduous
Sub-dominant	Coniferous	Coniferous
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	76-100	76-100
Mid-Channel Canopy	Closed	
<u>3.2 Riparian Buffer</u>		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	>100	>100
Sub-dominant	5-25	5-25
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Mixed Trees	Mixed Trees
Sub-dominant	Coniferous	Coniferous
<u>3.3 Riparian Corridor</u>		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Forest	Forest
Sub-dominant	Residential	Residential
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	Multiple	20.00
Gullies	None	0.00

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps	Abundant		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Moderate		
4.4 # of Debris Jams	11		
4.5 Impoundments	None		
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	6	4	6
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
1	0	1	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
3	0		
5.4 Stream Ford or Animal	No		
5.5 Straightening	Yes		
5.5 Dredging	None		

Notes:

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: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Segment Summary page 1 of 2
 Reach # **M17** Segment: **B**
 Observers: **LG, MS, Lucas** Why Not assessed:
 Segment Location:

November 30, 2006 **FIT: Yes**
 Completion Date: **June 14, 2006**
 Rain: **Yes**

Step 1. Valley and Floodplain			
1.1 Segmentation	Corridor Encroachment		
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Not Evalua	Not Evalua	
<u>1.5 Valley Features</u>			
Valley Width (ft)	112		
Width Determination	Measured		
Confinement Type	Narrowly		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Some areas may have been straightened in the past, now it is difficult to determine.

Step 2. Stream Channel		
2.1 Bankfull Width		23
2.2 Max Depth (ft)		2.30
2.3 Mean Depth (ft)		1.35
2.4 Floodprone Width (ft)		102
2.5 Aband. Floodpln		2.30
2.6 Width/Depth Ratio		17.11
2.7 Entrenchment Ratio		4.43
2.8 Incision Ratio		1.00
2.9 Sinuosity		Moderate
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		75
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	8 %	
Cobble	37 %	
Coarse Gravel	20 %	
Fine Gravel	10 %	
Sand	25 %	
<u>2.13 Average Largest Particle on</u>		
Bed	12.0	inches
Bar	4.0	inches
<u>2.14 Stream Type</u>		
Stream Type:	B	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Step-Pool	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

Step 3. Riparian Features			
<u>3.1 Stream Banks</u>			
Typical Bank Slope	Steep		
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type	Sand	Sand	
Consistency	Non-cohesive	Non-cohesive	
Lower			
Material Type	Boulder/Cobbl	Boulder/Cobbl	
Consistency	Non-cohesive	Non-cohesive	
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	305	542	
Erosion Height (ft)	4.00	4.83	
Revetmt. Type	Rip-Rap	None	
Revetmt. Length (ft)	57	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	Deciduous	Deciduous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	51-75	51-75	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	51-100	
Sub-dominant	None	26-50	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Mixed Trees	Mixed Trees	
Sub-dominant	Deciduous	Deciduous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Pasture	
Sub-dominant	None	Residential	
	<u>Amount</u>	<u>Mean Height</u>	
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	2		
4.5 Impoundments			
Impoundmt. Location			
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow			
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	1	7	5
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	4	1	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
3	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
9	0	Yes	
5.4 Stream Ford or Animal	Yes		
5.5 Straightening	No		
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: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **11,430**

Phase 2 Segment Summary page 1 of 2
 Reach # **T01.01** Segment: **0**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **Confluence with Poultney, upstream almost to Main Road.**

November 30, 2006 **FIT: No**
 Completion Date: **June 3, 2005**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Very Steep	Very Steep	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
	<u>Texture</u>	<u>Bedrock</u>	<u>Bedrock</u>
<u>1.5 Valley Features</u>			
Valley Width (ft)	539		
Width Determination			
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 3 ft. post European settlement deposits leads to higher banks lower in reach. Banks much lower in upper reach but many bedrock constraints throughout.

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width	62	
2.2 Max Depth (ft)	6.50	
2.3 Mean Depth (ft)	4.80	
2.4 Floodprone Width (ft)	539	
2.5 Aband. Floodpln	8.00	
2.6 Width/Depth Ratio	12.92	
2.7 Entrenchment Ratio	8.69	
2.8 Incision Ratio	1.23	
2.9 Sinuosity	Moderate	
2.10 Riffles Type	Sedimented	
2.11 Riffle/Step Spacing (ft)	0	
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	0 %	
Coarse Gravel	16 %	
Fine Gravel	26 %	
Sand	58 %	
Silt/Clay Present?	Yes	
Detritus	0 %	
# Large Woody	8	
<u>2.13 Average Largest Particle on</u>		
Bed	32.0	mm
Bar	0.0	mm
<u>2.14 Stream Type</u>		
Stream Type:	C	
Bed Material:	Sand	
Subclass Slope:	c	
Bed Form:	Dune-Ripple	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	3,252	2,712	
Erosion Height (ft)	6.00	6.00	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Bare	Bare	
Sub-dominant	Herbaceous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	1-25	1-25	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	>100	>100	
Sub-dominant	5-25	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Deciduous	Deciduous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	Hay	Hay	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	7.50	
Gullies		0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Low		
4.4 # of Debris Jams	2		
4.5 Impoundments	Small		
Impoundmt. Location	Upstream		
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow	Run-of-river		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	2	2	2
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	2	0	0
<u>5.2 Other Features</u>			
Flood	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
2	0	Yes	
5.4 Stream Ford or Animal No			
5.5 Straightening Yes			
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: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **6,288**

Phase 2 Segment Summary page 1 of 2
 Reach # **T01.02** Segment: **0**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **In West Haven, upstream of Main Road in confined reach.**

November 30, 2006
 Completion Date: **June 3, 2005**
 FIT: **No**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>	<u>Left</u>	<u>Right</u>	
Hillside Slope	Steep	Steep	
Continuous w/	Always	Always	
W/in 1 Bankfill	Always	Always	
Texture	Silt/Clay	Silt/Clay	
<u>1.5 Valley Features</u>			
Valley Width (ft)	235		
Width Determination			
Confinement Type	Semi-confined		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Confined by high banks of clay with one mass failure of high bank at bend at downstream end of reach.

<u>Step 2. Stream Channel</u>			
2.1 Bankfull Width			60
2.2 Max Depth (ft)			7.40
2.3 Mean Depth (ft)			4.70
2.4 Floodprone Width (ft)			131
2.5 Aband. Floodpln			9.40
2.6 Width/Depth Ratio			12.77
2.7 Entrenchment Ratio			2.18
2.8 Incision Ratio			1.27
2.9 Sinuosity			Moderate
2.10 Riffles Type			Not
2.11 Riffle/Step Spacing (ft)			0
<u>2.12 Substrate Composition</u>			
Bedrock	0	%	
Boulder	0	%	
Cobble	0	%	
Coarse Gravel	0	%	
Fine Gravel	0	%	
Sand	100	%	
Silt/Clay Present?			Yes
Detritus			0 %
# Large Woody			0
<u>2.13 Average Largest Particle on</u>			
Bed	2.0	mm	
Bar	0.0	mm	
<u>2.14 Stream Type</u>			
Stream Type:	B		
Bed Material:	Sand		
Subclass Slope:	c		
Bed Form:	Dune-Ripple		
<u>2.15 Reference Stream Type</u>			
(if different from Phase 1)			

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	453	994	
Erosion Height (ft)	7.00	7.00	
Revetmt. Type	Rip-Rap	None	
Revetmt. Length (ft)	105	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Bare	Bare	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	1-25	1-25	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	<5	<5	
Sub-dominant	>100	>100	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	Deciduous	Deciduous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	Hay	Hay	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	One	30.00	
Gullies		0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	None		
4.3 Flow Status	Low		
4.4 # of Debris Jams	0		
4.5 Impoundments	Small		
Impoundmt. Location	Upstream		
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow	Run-of-river		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	0	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal	No		
5.5 Straightening	No		
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: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **24,554**

Phase 2 Segment Summary page 1 of 2
 Reach # **T01.03** Segment: **0**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **In tthe own of West Haven, includes Hubbardton Clay Plain Forest Preserve.**

November 30, 2006 **FIT: No**
 Completion Date: **June 2, 2005**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
	<u>Texture</u>	<u>Silt/Clay</u>	<u>Silt/Clay</u>
1.5 Valley Features			
Valley Width (ft)	299		
Width Determination			
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Active incision with mass failures on both sides and rejuvenated tributaries.

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width		26
2.2 Max Depth (ft)		4.40
2.3 Mean Depth (ft)		3.20
2.4 Floodprone Width (ft)		46
2.5 Aband. Floodpln		7.50
2.6 Width/Depth Ratio		8.12
2.7 Entrenchment Ratio		1.77
2.8 Incision Ratio		1.70
2.9 Sinuosity		High
2.10 Riffles Type		Sedimented
2.11 Riffle/Step Spacing (ft)		0
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	0 %	
Coarse Gravel	0 %	
Fine Gravel	0 %	
Sand	100 %	
Silt/Clay Present?	Yes	
Detritus	0 %	
# Large Woody	25	
<u>2.13 Average Largest Particle on</u>		
Bed	2.0	mm
Bar	0.0	mm
<u>2.14 Stream Type</u>		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	c	
Bed Form:	Dune-Ripple	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	6,909	6,011	
Erosion Height (ft)	8.00	8.00	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Bare	Bare	
Sub-dominant	Herbaceous	Herbaceous	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	26-50	26-50	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	51-100	51-100	
Sub-dominant	5-25	5-25	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Coniferous	Coniferous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Forest	Forest	
Sub-dominant	Hay	Hay	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	Multiple	12.50	
Gullies		0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Low		
4.4 # of Debris Jams	1		
4.5 Impoundments	Small		
Impoundmt. Location	Upstream		
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow	Run-of-river		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	2	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	2	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	Yes	
5.4 Stream Ford or Animal Yes			
5.5 Straightening Yes			
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: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **16,765**

Phase 2 Segment Summary page 1 of 2

Reach # **T01.04** Segment: **0** Completion Date: **June 1, 2005**
 Observers: **J Field/ A. Patmos** Why Not assessed:
 Segment Location: **Crosses 22A at downstream end. Above culvert is lovely Cunningham land on right bank.** Rain: **No**

November 30, 2006

FIT: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	0
Roads	0	0	0
Railroads	0	0	0
Improved Paths	0	0	0
Development	0	0	0
<u>1.4 Adjacent Side</u>	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Silt/Clay	Silt/Clay	
<u>1.5 Valley Features</u>			
Valley Width (ft)	369		
Width Determination			
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 More wooded upstream end has more wood and debris in channel. Lots of historic flood chutes - less active today due to wood removal

<u>Step 2. Stream Channel</u>		
2.1 Bankfull Width		27
2.2 Max Depth (ft)		5.50
2.3 Mean Depth (ft)		4.80
2.4 Floodprone Width (ft)		279
2.5 Aband. Floodpln		5.50
2.6 Width/Depth Ratio		5.62
2.7 Entrenchment Ratio		10.33
2.8 Incision Ratio		1.00
2.9 Sinuosity		High
2.10 Riffles Type		Not
2.11 Riffle/Step Spacing (ft)		0
<u>2.12 Substrate Composition</u>		
Bedrock	0 %	
Boulder	0 %	
Cobble	0 %	
Coarse Gravel	5 %	
Fine Gravel	50 %	
Sand	45 %	
Silt/Clay Present?	Yes	
Detritus	3 %	
# Large Woody	6	
<u>2.13 Average Largest Particle on</u>		
Bed	23.0	mm
Bar	0.0	mm
<u>2.14 Stream Type</u>		
Stream Type:	E	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Dune-Ripple	
<u>2.15 Reference Stream Type</u>		
(if different from Phase 1)		

<u>Step 3. Riparian Features</u>			
<u>3.1 Stream Banks</u>			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	7,697	6,444	
Erosion Height (ft)	6.00	6.00	
Revetmt. Type	Rip-Rap	Rip-Rap	
Revetmt. Length (ft)	398	326	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	1-25	1-25	
Mid-Channel Canopy	Open		
<u>3.2 Riparian Buffer</u>			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	5-25	5-25	
Sub-dominant	<5	<5	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	Herbaceous	Herbaceous	
<u>3.3 Riparian Corridor</u>			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	Hay	Hay	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies		0.00	

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Low		
4.4 # of Debris Jams	2		
4.5 Impoundments	Small		
Impoundmt. Location	Upstream		
4.6 # of Stormwater Inputs	0		
4.7 Upstream Flow	Run-of-river		
4.9 # of Beaver Dams	0		
Affected Length (ft)	0		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	2	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
<u>5.2 Other Features</u>			
<u>Flood</u>	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	1	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal	Yes		
5.5 Straightening	No		
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: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **7,820**

Phase 2 Segment Summary page 1 of 2
 Reach # **T01.06** Segment: **0**
 Observers: **J Field/ A. Patmos/P Marangelo** Why Not assessed:
 Segment Location: **Town of Benson. Tylord Farm property. Reach upstream of Mill Pond.**

November 30, 2006
 Completion Date: **June 2, 2005**
 FIT: **No**
 Rain: **No**

<u>Step 1. Valley and Floodplain</u>			
1.1 Segmentation			
1.2 Alluvial Fan	No		
<u>1.3 Corridor Encroachments</u>			
	<u>Length (ft)</u>	<u>One</u>	<u>Both</u>
Berms	0	0	
Roads	0	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
<u>1.4 Adjacent Side</u>			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Always	Sometimes	
Texture	Silt/Clay	Silt/Clay	
<u>1.5 Valley Features</u>			
Valley Width (ft)	380		
Width Determination			
Confinement Type	Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Possible straightening.
 Quiet water behind beaver dams for nearly entire reach. Culvert under road crossing also plugged by debris jam. Upstream of culvert-walked entire length. Downstream of culvert - not walked- assumed slightly ponded behind Mill Dam.

<u>Step 2. Stream Channel</u>	
2.1 Bankfull Width	35
2.2 Max Depth (ft)	4.80
2.3 Mean Depth (ft)	3.10
2.4 Floodprone Width (ft)	380
2.5 Aband. Floodpln	4.80
2.6 Width/Depth Ratio	11.29
2.7 Entrenchment Ratio	10.86
2.8 Incision Ratio	1.00
2.9 Sinuosity	High
2.10 Riffles Type	Not
2.11 Riffle/Step Spacing (ft)	0
<u>2.12 Substrate Composition</u>	
Bedrock	0 %
Boulder	0 %
Cobble	0 %
Coarse Gravel	0 %
Fine Gravel	0 %
Sand	100 %
Silt/Clay Present?	Yes
Detritus	3 %
# Large Woody	5
<u>2.13 Average Largest Particle on</u>	
Bed	2.0 mm
Bar	0.0 mm
<u>2.14 Stream Type</u>	
Stream Type:	E
Bed Material:	Sand
Subclass Slope:	c
Bed Form:	Dune-Ripple
<u>2.15 Reference Stream Type</u>	
(if different from Phase 1)	

<u>Step 3. Riparian Features</u>		
<u>3.1 Stream Banks</u>		
Typical Bank Slope	Moderate	
Bank Texture	<u>Left</u>	<u>Right</u>
Upper		
Material Type		
Consistency		
Lower		
Material Type		
Consistency		
Bank Erosion	<u>Left</u>	<u>Right</u>
Erosion Length (ft)	2,492	2,841
Erosion Height (ft)	5.00	5.00
Revetmt. Type	None	None
Revetmt. Length (ft)	0	0
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Herbaceous	Herbaceous
Sub-dominant	Bare	Bare
Bank Canopy	<u>Left</u>	<u>Right</u>
Canopy %	1-25	1-25
Mid-Channel Canopy	Open	
<u>3.2 Riparian Buffer</u>		
Buffer Width	<u>Left</u>	<u>Right</u>
Dominant	51-100	51-100
Sub-dominant	<5	<5
Buffer Veg. Type	<u>Left</u>	<u>Right</u>
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Coniferous	Coniferous
<u>3.3 Riparian Corridor</u>		
Corridor Land	<u>Left</u>	<u>Right</u>
Dominant	Shrubs/Saplin	Shrubs/Saplin
Sub-dominant	Hay	Hay
	<u>Amount</u>	<u>Mean Height</u>
Mass Failures	None	0.00
Gullies		0.00

<u>Step 4. Flow & Flow Modifiers</u>			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Abundant		
4.3 Flow Status	Moderate		
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	2		
Affected Length (ft)	6,000		
<u>Step 5. Channel Bed and Planform Changes</u>			
<u>5.1 Bar Types</u>			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	1	1	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
<u>5.2 Other Features</u>			
Flood	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
2	0	0	0
<u>5.3 Steep Riffles and Head Cuts</u>			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
2	0	No	
5.4 Stream Ford or Animal	No		
5.5 Straightening	Yes		
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: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **7,350**

Phase 2 Segment Summary page 1 of 2
 Reach # **T01.07** Segment: **0**
 Observers: **J Field/ A. Patmos/P Marangelo** Why Not assessed:
 Segment Location: **Off of Lake Hortonia Rd. in Benson.**

November 30, 2006 **FIT: No**
 Completion Date: **August 4, 2005**
 Rain: **No**

Step 1. Valley and Floodplain			
1.1 Segmentation			
1.2 Alluvial Fan	No		
1.3 Corridor Encroachments			
Length (ft)	<u>One</u>	<u>Both</u>	
Berms	0	0	
Roads	0	0	
Railroads	0	0	
Improved Paths	0	0	
Development	0	0	
1.4 Adjacent Side			
	<u>Left</u>	<u>Right</u>	
Hillside Slope	Hilly	Hilly	
Continuous w/	Sometimes	Sometimes	
W/in 1 Bankfill	Sometimes	Sometimes	
Texture	Silt/Clay	Silt/Clay	
1.5 Valley Features			
Valley Width (ft)	534		
Width Determination			
Confinement Type	Very Broad		
Rock Gorge?	No		
Human-caused changed valley width?	No		

Notes:
 Wood removed historically but some now exists by tree fall trapping debris and beaver dams.

Step 2. Stream Channel		
2.1 Bankfull Width		22
2.2 Max Depth (ft)		2.10
2.3 Mean Depth (ft)		1.50
2.4 Floodprone Width (ft)		534
2.5 Aband. Floodpln		2.10
2.6 Width/Depth Ratio		14.67
2.7 Entrenchment Ratio		24.27
2.8 Incision Ratio		1.00
2.9 Sinuosity		High
2.10 Riffles Type		Complete
2.11 Riffle/Step Spacing (ft)		0
2.12 Substrate Composition		
Bedrock	0 %	
Boulder	0 %	
Cobble	2 %	
Coarse Gravel	25 %	
Fine Gravel	35 %	
Sand	38 %	
2.13 Average Largest Particle on		
Bed	83.0	mm
Bar	0.0	mm
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
2.15 Reference Stream Type		
(if different from Phase 1)		

Step 3. Riparian Features			
3.1 Stream Banks			
Typical Bank Slope Steep			
Bank Texture	<u>Left</u>	<u>Right</u>	
Upper			
Material Type			
Consistency			
Lower			
Material Type			
Consistency			
Bank Erosion	<u>Left</u>	<u>Right</u>	
Erosion Length (ft)	2,170	2,841	
Erosion Height (ft)	5.00	5.00	
Revetmt. Type	None	None	
Revetmt. Length (ft)	0	0	
Near Bank Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Herbaceous	Herbaceous	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
Bank Canopy	<u>Left</u>	<u>Right</u>	
Canopy %	1-25	1-25	
Mid-Channel Canopy	Open		
3.2 Riparian Buffer			
Buffer Width	<u>Left</u>	<u>Right</u>	
Dominant	26-50	26-50	
Sub-dominant	<5	<5	
Buffer Veg. Type	<u>Left</u>	<u>Right</u>	
Dominant	Shrubs/Saplin	Shrubs/Saplin	
Sub-dominant	Deciduous	Deciduous	
3.3 Riparian Corridor			
Corridor Land	<u>Left</u>	<u>Right</u>	
Dominant	Hay	Hay	
Sub-dominant	Shrubs/Saplin	Shrubs/Saplin	
	<u>Amount</u>	<u>Mean Height</u>	
Mass Failures	None	0.00	
Gullies		0.00	

Step 4. Flow & Flow Modifiers			
4.1 Springs / Seeps	Some		
4.2 Adjacent Wetlands	Some		
4.3 Flow Status	Low		
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	5		
Affected Length (ft)	750		
Step 5. Channel Bed and Planform Changes			
5.1 Bar Types			
	<u>Mid</u>	<u>Point</u>	<u>Side</u>
	0	2	0
	<u>Diagonal</u>	<u>Delta</u>	<u>Island</u>
	0	0	0
5.2 Other Features			
Flood	<u>Neck Cutoff</u>	<u>Avulsion</u>	<u>Braiding</u>
0	0	0	0
5.3 Steep Riffles and Head Cuts			
<u>Steep Riffles</u>	<u>Head Cuts</u>	<u>Trib Rejuv.</u>	
0	0	No	
5.4 Stream Ford or Animal			
No			
5.5 Straightening			
No			
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: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M01**

Segment: **0**

Completion Date: **June 1, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **31,718**

Segment Location: **West Haven. In Ward Marsh area.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	0.00	No	No	No	Yes
	Problem	None			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	14		No
Total Score	61		
Geomorphic Rating	0.7625		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	Moderate		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	11	
6.2 Pool Substrate	11	
6.3 Pool Variability	6	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	13	
6.6 Channel Alteration	13	
6.7 Channel Sinuosity	13	
6.8 Bank Stability	Left: 7	Right: 7
6.9 Bank Vegetation Protection	Left: 5	Right: 5
6.10 Riparian Vegetation Zone Width	Left: 7	Right: 7
Total Score	113	
Habitat Rating	0.565	
Habitat Stream Condition	Fair	

Narrative:

Stable condition with some widening and deposition. Area effected by Lake Champlain backwater.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M02**

Segment: **0**

Completion Date: **July 11, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, TG**

Rain: **No**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	82.0	Yes	No	Yes	Yes
	Problem	None			

Narrative:
Incised.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	10	None	Yes
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	13		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	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	6	
6.2 Pool Substrate	10	
6.3 Pool Variability	13	
6.4 Sediment Deposition	13	
6.5 Channel Flow Status	19	
6.6 Channel Alteration	11	
6.7 Channel Sinuosity	8	
6.8 Bank Stability	Left: 4	Right: 4
6.9 Bank Vegetation Protection	Left: 7	Right: 7
6.10 Riparian Vegetation Zone Width	Left: 4	Right: 1
Total Score	107	
Habitat Rating	0.535	
Habitat Stream Condition	Fair	

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M03**

Segment: **0**

Completion Date: **May 31, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **6,308**

Segment Location: **Upstream of Hubbardton confluence on old sod farm owned by TNC**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
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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	Yes
7.3 Widening Channel	13		Yes
7.4 Change in Planform	14		Yes
Total Score	53		
Geomorphic Rating	0.6625		
Channel Evolution Model	F		
Channel Evolution Stage	V		
Geomorphic Condition	Good		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **Low**

	Score
6.1 Epifaunal Substrate - Available Cover	11
6.2 Pool Substrate	7
6.3 Pool Variability	12
6.4 Sediment Deposition	12
6.5 Channel Flow Status	10
6.6 Channel Alteration	18
6.7 Channel Sinuosity	14
6.8 Bank Stability	Left: 9 Right: 4
6.9 Bank Vegetation Protection	Left: 5 Right: 2
6.10 Riparian Vegetation Zone Width	Left: 10 Right: 2
Total Score	116
Habitat Rating	0.58

Habitat Stream Condition

Fair

Narrative:

Widening and aggradation in previously incised channel. Stream departure complete - has returned to C-type channel

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M04**

Segment: **0**

Completion Date: **July 11, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, TG**

Rain: **No**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Dam	Upstream	120.00	110.00	No	No
Dam	Upstream	120.00	110.00	No	No

4.8 Channel Constrictions **None**

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

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Confined	Score	STD	Historic
7.1 Channel Degradation		4	B to F	Yes
7.2 Channel Aggradation		8	Other	No
7.3 Widening Channel		11		No
7.4 Change in Planform		13		No
Total Score		36		
Geomorphic Rating		0.45		
Channel Evolution Model		F		
Channel Evolution Stage		III		
Geomorphic Condition		Poor		
Stream Sensitivity		Extreme		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	Score
6.1 Epifaunal Substrate - Available Cover		6
6.2 Embeddedness		4
6.3 Velocity/Depth Patterns		15
6.4 Sediment Deposition		8
6.5 Channel Flow Status		15
6.6 Channel Alteration		18
6.7 Frequency of Riffles/Steps		5
6.8 Bank Stability	Left: 1 Right: 2	
6.9 Bank Vegetation Protection	Left: 9 Right: 9	
6.10 Riparian Vegetation Zone Width	Left: 10 Right: 10	
Total Score		112
Habitat Rating		0.56
Habitat Stream Condition		Fair

Narrative:

Incised and entrenched. Stream type departure from B to F. Major aggradation and some planform and widening.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M05**
 Observers: **LG, TG**
 Segment Location:

page 2 of 2
 Segment: **0**

November 30, 2006
 Completion Date: **July 10, 2006**
 Rain: **No**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Mid-	4.00	1.00	No	No
Ledge	Mid-	8.00	3.00	No	No
Ledge	Mid-	7.00	1.00	No	No
Ledge	Mid-	8.00	3.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	4.00	1.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	80.0	Yes	No	Yes	Yes
	Problem	None			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Confined	Score	STD	Historic
7.1 Channel Degradation		13	None	Yes
7.2 Channel Aggradation		13	None	No
7.3 Widening Channel		13		No
7.4 Change in Planform		14		No
Total Score		53		
Geomorphic Rating		0.6625		
Channel Evolution Model		F		
Channel Evolution Stage		IV		
Geomorphic Condition		Good		
Stream Sensitivity		High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	Score
6.1 Epifaunal Substrate - Available Cover		8
6.2 Embeddedness		8
6.3 Velocity/Depth Patterns		18
6.4 Sediment Deposition		11
6.5 Channel Flow Status		18
6.6 Channel Alteration		18
6.7 Frequency of Riffles/Steps		12
6.8 Bank Stability	Left: 5 Right: 5	
6.9 Bank Vegetation Protection	Left: 7 Right: 7	
6.10 Riparian Vegetation Zone Width	Left: 8 Right: 8	
Total Score		133
Habitat Rating		0.665
Habitat Stream Condition		Good

Narrative:

Incised, minor aggradation, widening and planform.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M06**
 Observers: **LG, TG**
 Segment Location:

page 2 of 2
 Segment: **0**

November 30, 2006
 Completion Date: **July 7, 2006**
 Rain: **No**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Waterfall	Downstrea	10.00	8.00	No	No
Ledge	Mid-	3.00	1.00	No	No
Ledge	Mid-	14.00	3.00	No	No
Ledge	Mid-	3.00	1.00	No	No
Ledge	Mid-	2.00	1.00	No	No
Ledge	Upstream	5.00	1.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	105.0	Yes None	No	No	Yes
Bridge	54.0	Yes None	No	Yes	Yes

Narrative:
 Minor planform 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	17	None	No
7.3 Widening Channel	14		Yes
7.4 Change in Planform	13		No
Total Score	58		
Geomorphic Rating	0.725		
Channel Evolution Model	F		
Channel Evolution Stage	IV		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	8	
6.2 Pool Substrate	16	
6.3 Pool Variability	14	
6.4 Sediment Deposition	14	
6.5 Channel Flow Status	18	
6.6 Channel Alteration	18	
6.7 Channel Sinuosity	11	
6.8 Bank Stability	Left: 6	Right: 6
6.9 Bank Vegetation Protection	Left: 7	Right: 8
6.10 Riparian Vegetation Zone Width	Left: 2	Right: 9
Total Score	137	
Habitat Rating	0.685	
Habitat Stream Condition	Good	

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M07**

Segment: **0**

Completion Date: **July 7, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, TG**

Rain: **No**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls None

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	112.0	Yes Problem None	No	No	Yes
Old	54.0	Yes Problem None	Yes	Yes	Yes
Old	25.0	Yes Problem None	Yes	Yes	Yes

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	12	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	10		No
7.4 Change in Planform	3		No
Total Score	38		
Geomorphic Rating	0.475		
Channel Evolution Model	F		
Channel Evolution Stage	IV		
Geomorphic Condition	Poor		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	15	
6.2 Pool Substrate	15	
6.3 Pool Variability	13	
6.4 Sediment Deposition	14	
6.5 Channel Flow Status	17	
6.6 Channel Alteration	10	
6.7 Channel Sinuosity	12	
6.8 Bank Stability	Left: 3	Right: 3
6.9 Bank Vegetation Protection	Left: 6	Right: 7
6.10 Riparian Vegetation Zone Width	Left: 3	Right: 3
Total Score	121	
Habitat Rating	0.605	
Habitat Stream Condition	Fair	

Narrative:

Extreme planform adjustment. Some widening (W/D ratio reflects flood chutes) and aggradation.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M08**

Segment: **0**

Completion Date: **June 25, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, TG**

Rain: **Yes**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
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Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	13	None	Yes
7.2 Channel Aggradation	10	None	No
7.3 Widening Channel	10		No
7.4 Change in Planform	7		No
Total Score	40		
Geomorphic Rating	0.5		
Channel Evolution Model	F		
Channel Evolution Stage	IV		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **High**

	Score
6.1 Epifaunal Substrate - Available Cover	12
6.2 Embeddedness	7
6.3 Velocity/Depth Patterns	18
6.4 Sediment Deposition	10
6.5 Channel Flow Status	19
6.6 Channel Alteration	9
6.7 Frequency of Riffles/Steps	14
6.8 Bank Stability	Left: 3 Right: 3
6.9 Bank Vegetation Protection	Left: 6 Right: 7
6.10 Riparian Vegetation Zone Width	Left: 3 Right: 5
Total Score	116
Habitat Rating	0.58

Habitat Stream Condition

Fair

Narrative:

Planform, minor widening (localized) and aggradation. Riprap limiting migration to left bank.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M09**

Segment: **A**

Completion Date: **June 1, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **Yes**

Segment Length (ft): **7,704**

Segment Location: **GMC land past wastewater treatment facility in village of Poultney.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Upstream	2.00	0.50	No	No
Waterfall	Downstrea	20.00	5.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	0.00	No	No	Yes	Yes
	Problem	None			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	15	None	Yes
7.2 Channel Aggradation	13	None	Yes
7.3 Widening Channel	12		No
7.4 Change in Planform	7		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	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	17	
6.2 Pool Substrate	13	
6.3 Pool Variability	13	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	9	
6.6 Channel Alteration	8	
6.7 Channel Sinuosity	13	
6.8 Bank Stability	Left: 7	Right: 7
6.9 Bank Vegetation Protection	Left: 5	Right: 5
6.10 Riparian Vegetation Zone Width	Left: 7	Right: 7
Total Score	119	
Habitat Rating	0.595	
Habitat Stream Condition	Fair	

Narrative:

Planform changes and widening resulting from aggradation on flat valley floor.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M09**

Segment: **B**

Completion Date: **June 1, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **3,058**

Segment Location: **On GMC property, downstream of bridge.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	0.00	Yes	No	Yes	Yes

Problem Deposition Above, Scour Below, Alignment

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	10	None	Yes
7.2 Channel Aggradation	10	None	No
7.3 Widening Channel	12		No
7.4 Change in Planform	11		No
Total Score	43		
Geomorphic Rating	0.5375		
Channel Evolution Model	F		
Channel Evolution Stage	III		
Geomorphic Condition	Fair		
Stream Sensitivity	High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	8	
6.2 Pool Substrate	11	
6.3 Pool Variability	8	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	14	
6.6 Channel Alteration	2	
6.7 Channel Sinuosity	8	
6.8 Bank Stability	Left: 9	Right: 9
6.9 Bank Vegetation Protection	Left: 5	Right: 5
6.10 Riparian Vegetation Zone Width	Left: 7	Right: 2
Total Score	96	
Habitat Rating	0.48	
Habitat Stream Condition	Fair	

Narrative:

Bermed and straightened-armored and widened channel but too much armoring to work on banks and complete widening and planform changes.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M10**
 Observers: **LG, SH, HS**
 Segment Location:

page 2 of 2
 Segment: **0**

November 30, 2006
 Completion Date: **June 22, 2006**
 Rain: **Yes**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	3.00	1.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	0.00	0.00	No	No

7.0 Channel Constrictions

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	7	C to F	Yes
7.2 Channel Aggradation	9	Other	No
7.3 Widening Channel	10		No
7.4 Change in Planform	12		No
Total Score		38	
Geomorphic Rating		0.475	
Channel Evolution Model		F	
Channel Evolution Stage		III	
Geomorphic Condition		Poor	
Stream Sensitivity		Extreme	

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	7	
6.2 Embeddedness	4	
6.3 Velocity/Depth Patterns	11	
6.4 Sediment Deposition	6	
6.5 Channel Flow Status	15	
6.6 Channel Alteration	13	
6.7 Frequency of Riffles/Steps	9	
6.8 Bank Stability	Left: 6	Right: 6
6.9 Bank Vegetation Protection	Left: 9	Right: 9
6.10 Riparian Vegetation Zone Width	Left: 5	Right: 5
Total Score		105
Habitat Rating		0.525

Habitat Stream Condition **Fair**

Narrative:
 Historical straightening, stream type departure from C to F due to incision. Now aggradation and widening with minor planform. Poor condition due to stream type departure.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M11**
 Observers: **LG, MS**
 Segment Location:

page 2 of 2
 Segment: **A**

November 30, 2006
 Completion Date: **June 20, 2006**
 Rain: **Yes**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Downstrea	0.00	0.00	No	No
Waterfall	Downstrea	35.00	35.00	No	No
Ledge	Downstrea	0.00	0.00	No	No
Ledge	Downstrea	0.00	0.00	No	No
Ledge	Downstrea	0.00	0.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	88.0	Yes	No	No	No
	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	8	None	No
7.3 Widening Channel	8		No
7.4 Change in Planform	13		No
Total Score		37	
Geomorphic Rating		0.4625	
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	5	
6.2 Embeddedness	2	
6.3 Velocity/Depth Patterns	13	
6.4 Sediment Deposition	5	
6.5 Channel Flow Status	18	
6.6 Channel Alteration	13	
6.7 Frequency of Riffles/Steps	6	
6.8 Bank Stability	Left: 8	Right: 8
6.9 Bank Vegetation Protection	Left: 9	Right: 6
6.10 Riparian Vegetation Zone Width	Left: 7	Right: 1
Total Score		101
Habitat Rating		0.505
Habitat Stream Condition		Fair

Narrative:
 Incised, overwidened with aggradation.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M11**
 Observers: **LG, MS**

page 2 of 2
 Segment: **B**

November 30, 2006
 Completion Date: **June 20, 2006**
 Rain: **Yes**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Mid-	0.00	0.00	No	No
Ledge	Upstream	0.00	0.00	No	No
Ledge	Upstream	0.00	0.00	No	No
Ledge	Upstream	0.00	0.00	No	No
Ledge	Upstream	9.00	2.00	No	No

4.8 Channel Constrictions

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

Narrative:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type

Channel Evolution Model
 Channel Evolution Stage
 Geomorphic Condition
 Stream Sensitivity

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type

Habitat Stream Condition

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M12**

Segment: **A**

Completion Date: **June 20, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, HS, MS**

Rain: **Yes**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Mid-	8.00	1.00	No	No
Ledge	Mid-	0.00	0.00	No	No
Ledge	Mid-	1.00	0.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	90.0	Yes	Yes	No	Yes
	Problem	None			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	9	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	15		No
Total Score	55		
Geomorphic Rating	0.6875		
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	7	
6.2 Embeddedness	10	
6.3 Velocity/Depth Patterns	13	
6.4 Sediment Deposition	3	
6.5 Channel Flow Status	16	
6.6 Channel Alteration	13	
6.7 Frequency of Riffles/Steps	13	
6.8 Bank Stability	Left: 8	Right: 8
6.9 Bank Vegetation Protection	Left: 8	Right: 8
6.10 Riparian Vegetation Zone Width	Left: 6	Right: 5
Total Score	118	
Habitat Rating	0.59	
Habitat Stream Condition	Fair	

Narrative:

Major aggradation with some widening and planform.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M12**
 Observers: **LG, HS, MS**

page 2 of 2
 Segment: **B**

November 30, 2006
 Completion Date: **June 20, 2006**
 Rain: **Yes**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Waterfall	Upstream	15.00	10.00	No	No
Ledge	Upstream	12.00	1.00	No	No
Ledge	Upstream	12.00	1.00	No	No

4.8 Channel Constrictions

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

Narrative:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type

Channel Evolution Model
 Channel Evolution Stage
 Geomorphic Condition
 Stream Sensitivity

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type

Habitat Stream Condition

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRCD**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M13**
 Observers: **LG, HS**
 Segment Location:

page 2 of 2
 Segment: **0**

November 30, 2006
 Completion Date: **July 17, 2006**
 Rain: **Yes**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Mid-	3.00	1.00	No	No
Ledge	Mid-	3.00	1.00	No	No
Ledge	Mid-	3.00	0.00	No	No
Ledge	Mid-	7.00	2.00	No	No
Ledge	Mid-	3.00	1.00	No	No
Ledge	Mid-	2.00	1.00	No	No
Ledge	Mid-	3.00	0.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	52.0	No	No	Yes	Yes
	Problem	Deposition	Above		
Bridge	90.0	Yes	No	No	Yes
	Problem	None			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	14	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	12		No
7.4 Change in Planform	10		No
Total Score	48		
Geomorphic Rating	0.6		
Channel Evolution Model	F		
Channel Evolution Stage	IV		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	11	
6.2 Embeddedness	10	
6.3 Velocity/Depth Patterns	18	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	15	
6.6 Channel Alteration	13	
6.7 Frequency of Riffles/Steps	11	
6.8 Bank Stability	Left: 7	Right: 6
6.9 Bank Vegetation Protection	Left: 7	Right: 6
6.10 Riparian Vegetation Zone Width	Left: 9	Right: 2
Total Score	123	
Habitat Rating	0.615	
Habitat Stream Condition	Fair	

Narrative:

Historical incision from terrace, new lower terrace and flood plain developed. Much planform activity unless confined by ledges.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M14**

Segment: **A**

Completion Date: **July 17, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, HS**

Rain: **Yes**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	43.0	Yes	No	Yes	Yes
Problem		Deposition Above			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	14	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	8		No
Total Score	47		
Geomorphic Rating	0.5875		
Channel Evolution Model	F		
Channel Evolution Stage	IV		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	12	
6.2 Embeddedness	12	
6.3 Velocity/Depth Patterns	16	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	16	
6.6 Channel Alteration	11	
6.7 Frequency of Riffles/Steps	17	
6.8 Bank Stability	Left: 8	Right: 8
6.9 Bank Vegetation Protection	Left: 8	Right: 6
6.10 Riparian Vegetation Zone Width	Left: 3	Right: 1
Total Score	126	
Habitat Rating	0.63	
Habitat Stream Condition	Fair	

Narrative:

Planform and aggradation. Possibly some bank or floodplain modifications by riparian landowners.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M14**
 Observers: **LG, MS**
 Segment Location:

page 2 of 2
 Segment: **B**

November 30, 2006
 Completion Date: **June 19, 2006**
 Rain: **Yes**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Downstrea	2.00	1.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	85.0	Yes	Yes	No	Yes
	Problem	Deposition	Above,	Scour	Below

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Confined	Score	STD	Historic
7.1 Channel Degradation		4	B to F	Yes
7.2 Channel Aggradation		12	Other	No
7.3 Widening Channel		12		Yes
7.4 Change in Planform		13		No
Total Score		41		
Geomorphic Rating		0.5125		
Channel Evolution Model		F		
Channel Evolution Stage		III		
Geomorphic Condition		Poor		
Stream Sensitivity		Extreme		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	Score
6.1 Epifaunal Substrate - Available Cover		8
6.2 Embeddedness		11
6.3 Velocity/Depth Patterns		14
6.4 Sediment Deposition		10
6.5 Channel Flow Status		11
6.6 Channel Alteration		11
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: 9 Right: 6	
Total Score		130
Habitat Rating		0.65
Habitat Stream Condition		Good

Narrative:

Historical degradation and widening, now aggradation and some planform. Poor condirion due to stream type departure.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M14**
 Observers: **LG, MS**
 Segment Location:

page 2 of 2
 Segment: **C**

November 30, 2006
 Completion Date: **June 19, 2006**
 Rain: **Yes**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Mid-	4.00	1.00	No	No

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	54.0	Yes	No	No	Yes
	Problem	Deposition	Above,	Scour Below	
Bridge	36.0	Yes	No	Yes	Yes
	Problem	Alignment			

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		12	Other	No
7.3 Widening Channel		9		No
7.4 Change in Planform		11		No
Total Score		37		
Geomorphic Rating		0.4625		
Channel Evolution Model		F		
Channel Evolution Stage		III		
Geomorphic Condition		Poor		
Stream Sensitivity		Extreme		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	Score
6.1 Epifaunal Substrate - Available Cover		11
6.2 Embeddedness		11
6.3 Velocity/Depth Patterns		13
6.4 Sediment Deposition		8
6.5 Channel Flow Status		13
6.6 Channel Alteration		13
6.7 Frequency of Riffles/Steps		13
6.8 Bank Stability	Left: 5 Right: 5	
6.9 Bank Vegetation Protection	Left: 8 Right: 7	
6.10 Riparian Vegetation Zone Width	Left: 6 Right: 1	
Total Score		114
Habitat Rating		0.57
Habitat Stream Condition		Fair

Narrative:

Historical degradation, now widening with minor aggradation. Poor condition due to stream type departure.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M15**

Segment: **0**

Completion Date: **June 1, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **10,989**

Segment Location: **Middletown Springs, upstream of South Brook confluence.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Upstream	3.00	0.50	No	No

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	16	None	Yes
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	13		No
Total Score	57		
Geomorphic Rating	0.7125		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	0.00	No	No	Yes	No
Old	0.00	No	No	No	Yes

Problem: None
Problem: Scour Below, Alignment

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	18	
6.2 Embeddedness	14	
6.3 Velocity/Depth Patterns	15	
6.4 Sediment Deposition	9	
6.5 Channel Flow Status	12	
6.6 Channel Alteration	14	
6.7 Frequency of Riffles/Steps	18	
6.8 Bank Stability	Left: 7	Right: 7
6.9 Bank Vegetation Protection	Left: 7	Right: 4
6.10 Riparian Vegetation Zone Width	Left: 6	Right: 4
Total Score	135	
Habitat Rating	0.675	
Habitat Stream Condition	Good	

Narrative:
Aggradation causing some planform changes but other areas constrained by bedrock ledge. Failure of non-alluvial slope dammed up channel in one place causing avulsion around mass failure.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M16**
 Observers: **LG, MS**
 Segment Location:

page 2 of 2
 Segment: **A**

November 30, 2006
 Completion Date: **June 13, 2006**
 Rain: **Yes**

1.6 Grade Controls None

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions None

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
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Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Plane Bed	Score	STD	Historic
7.1 Channel Degradation		16	None	No
7.2 Channel Aggradation		13	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		I		
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		14
6.3 Velocity/Depth Patterns		16
6.4 Sediment Deposition		8
6.5 Channel Flow Status		13
6.6 Channel Alteration		20
6.7 Frequency of Riffles/Steps		16
6.8 Bank Stability	Left: 7 Right: 7	
6.9 Bank Vegetation Protection	Left: 10 Right: 10	
6.10 Riparian Vegetation Zone Width	Left: 10 Right: 9	
Total Score		154
Habitat Rating		0.77
Habitat Stream Condition		Good

Narrative:
 Minor widening, aggradation and planform.

Project: **Poultney - Hubbardton River**
 Stream: **Poultney**
 Organization: **Poultney/Mettowee NRC**
 Segment Length (ft): **0**

Phase 2 Reach Summary
 Reach # **M16**
 Observers: **LG, MS**

page 2 of 2
 Segment: **B**

November 30, 2006
 Completion Date: **June 13, 2006**
 Rain: **Yes**

Segment Location:

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Waterfall	Mid-	60.00	55.00	No	No

4.8 Channel Constrictions

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

Step 7. Rapid Geomorphic Assessment Data

Confinement Type

Channel Evolution Model
 Channel Evolution Stage
 Geomorphic Condition
 Stream Sensitivity

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type

Habitat Stream Condition

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M16**

Segment: **C**

Completion Date: **June 14, 2006**

Organization: **Poultney/Mettowee NRCD**

Observers: **LG, MS**

Rain: **Yes**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
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Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	9		No
Total Score	53		
Geomorphic Rating	0.6625		
Channel Evolution Model	F		
Channel Evolution Stage	IV		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	14	
6.2 Embeddedness	13	
6.3 Velocity/Depth Patterns	14	
6.4 Sediment Deposition	6	
6.5 Channel Flow Status	9	
6.6 Channel Alteration	20	
6.7 Frequency of Riffles/Steps	17	
6.8 Bank Stability	Left: 4	Right: 4
6.9 Bank Vegetation Protection	Left: 8	Right: 6
6.10 Riparian Vegetation Zone Width	Left: 9	Right: 8
Total Score	132	
Habitat Rating	0.66	
Habitat Stream Condition	Good	

Narrative:

Major planform with aggradation.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M17**

Segment: **A**

Completion Date: **June 12, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, Lucas**

Rain: **Yes**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Instream	12.0	Yes	No	Yes	Yes
	Problem	None			

Narrative:

Minor widening, aggradation and planform.

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	13	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	12		No
Total Score	56		
Geomorphic Rating	0.7		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	Moderate		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	15	
6.2 Embeddedness	13	
6.3 Velocity/Depth Patterns	16	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	10	
6.6 Channel Alteration	20	
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: 9	Right: 9
Total Score	150	
Habitat Rating	0.75	
Habitat Stream Condition	Good	

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M17**

Segment: **B**

Completion Date: **June 14, 2006**

Organization: **Poultney/Mettowee NRC**

Observers: **LG, MS, Lucas**

Rain: **Yes**

Segment Length (ft): **0**

Segment Location:

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	14		No
7.4 Change in Planform	13		No
Total Score	55		
Geomorphic Rating	0.6875		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	Moderate		

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	18.3	Yes	No	Yes	Yes
	Problem	Deposition	Above,	Scour	Below

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	High	
	Score	
6.1 Epifaunal Substrate - Available Cover	16	
6.2 Embeddedness	15	
6.3 Velocity/Depth Patterns	16	
6.4 Sediment Deposition	10	
6.5 Channel Flow Status	10	
6.6 Channel Alteration	16	
6.7 Frequency of Riffles/Steps	16	
6.8 Bank Stability	Left: 6	Right: 6
6.9 Bank Vegetation Protection	Left: 9	Right: 8
6.10 Riparian Vegetation Zone Width	Left: 9	Right: 6
Total Score	143	
Habitat Rating	0.715	
Habitat Stream Condition	Good	

Narrative:

Minor widening, aggradation and planform.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Poultney**

Reach # **M17**

Segment: **C**

Completion Date:

Organization: **Poultney/Mettowee NRCD**

Observers: **LG**

Rain:

Segment Length (ft): **0**

Segment Location: **Mainstem is not in SGAT. The SGAT project highlights a tributary, which is Segment C,**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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Step 7. Rapid Geomorphic Assessment Data

Confinement Type

Channel Evolution Model
Channel Evolution Stage
Geomorphic Condition
Stream Sensitivity

4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
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Step 6. Rapid Habitat Assessment Data

Stream Gradient Type

Habitat Stream Condition

Narrative:

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Hubbardton**

Reach # **T01.01**

Segment: **0**

Completion Date: **June 3, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **11,430**

Segment Location: **Confluence with Poultney, upstream almost to Main Road.**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
Ledge	Downstrea	2.50	0.50	No	No

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	16	None	Yes
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	14		No
7.4 Change in Planform	14		No
Total Score	58		
Geomorphic Rating	0.725		
Channel Evolution Model	F		
Channel Evolution Stage	III		
Geomorphic Condition	Good		
Stream Sensitivity	Very High		

4.8 Channel Constrictions **None**

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

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	11	
6.2 Pool Substrate	13	
6.3 Pool Variability	8	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	10	
6.6 Channel Alteration	15	
6.7 Channel Sinuosity	15	
6.8 Bank Stability	Left: 5	Right: 5
6.9 Bank Vegetation Protection	Left: 5	Right: 5
6.10 Riparian Vegetation Zone Width	Left: 7	Right: 7
Total Score	114	
Habitat Rating	0.57	
Habitat Stream Condition	Fair	

Narrative:

Some incision may be related to Post-European sediments, now widened channel filling in with sediment.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Hubbardton**

Reach # **T01.02**

Segment: **0**

Completion Date: **June 3, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **6,288**

Segment Location: **In West Haven, upstream of Main Road in confined reach.**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Bridge	0.00	Yes	No	Yes	No
	Problem	None			

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
Confined			
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	17		No
Total Score	65		
Geomorphic Rating	0.8125		
Channel Evolution Model	F		
Channel Evolution Stage	II		
Geomorphic Condition	Good		
Stream Sensitivity	Moderate		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Score
Low	
6.1 Epifaunal Substrate - Available Cover	9
6.2 Pool Substrate	9
6.3 Pool Variability	10
6.4 Sediment Deposition	14
6.5 Channel Flow Status	16
6.6 Channel Alteration	16
6.7 Channel Sinuosity	3
6.8 Bank Stability	Left: 6 Right: 6
6.9 Bank Vegetation Protection	Left: 5 Right: 5
6.10 Riparian Vegetation Zone Width	Left: 3 Right: 3
Total Score	105
Habitat Rating	0.525
Habitat Stream Condition	Fair

Narrative:

Confined reach with slumping of banks in places. Incision is natural within confined valley cut into old lake sediments

Project: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **24,554**

Phase 2 Reach Summary
 Reach # **T01.03**
 Observers: **J Field/ A. Patmos**
 Segment Location: **In tthe own of West Haven, includes Hubbardton Clay Plain Forest Preserve.**

page 2 of 2
 Segment: **0**

November 30, 2006
 Completion Date: **June 2, 2005**
 Rain: **No**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions **None**

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
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Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	13		No
Total Score	58		
Geomorphic Rating	0.725		
Channel Evolution Model	F		
Channel Evolution Stage	II		
Geomorphic Condition	Good		
Stream Sensitivity	Very High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type **Low**

	Score
6.1 Epifaunal Substrate - Available Cover	8
6.2 Pool Substrate	8
6.3 Pool Variability	8
6.4 Sediment Deposition	12
6.5 Channel Flow Status	13
6.6 Channel Alteration	15
6.7 Channel Sinuosity	14
6.8 Bank Stability	Left: 5 Right: 5
6.9 Bank Vegetation Protection	Left: 4 Right: 4
6.10 Riparian Vegetation Zone Width	Left: 7 Right: 7
Total Score	110
Habitat Rating	0.55

Habitat Stream Condition **Fair**

Narrative:

Incised due to removal of wood - although meanders mostly remain intact large continuous sometimes vegetated lengths of bank detached and sliding in.

Project: **Poultney - Hubbardton River**

Phase 2 Reach Summary

page 2 of 2

November 30, 2006

Stream: **Hubbardton**

Reach # **T01.04**

Segment: **0**

Completion Date: **June 1, 2005**

Organization: **Field Geology Services**

Observers: **J Field/ A. Patmos**

Rain: **No**

Segment Length (ft): **16,765**

Segment Location: **Crosses 22A at downstream end. Above culvert is lovely Cunningham land on right**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Instream	0.00	Yes	No	Yes	Yes
	Problem	Deposition	Above,	Scour	Below
Bridge	0.00	No	No	Yes	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	14	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	13		Yes
Total Score	60		
Geomorphic Rating	0.75		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	5	
6.2 Pool Substrate	7	
6.3 Pool Variability	8	
6.4 Sediment Deposition	14	
6.5 Channel Flow Status	14	
6.6 Channel Alteration	18	
6.7 Channel Sinuosity	18	
6.8 Bank Stability	Left: 6	Right: 6
6.9 Bank Vegetation Protection	Left: 5	Right: 5
6.10 Riparian Vegetation Zone Width	Left: 4	Right: 4
Total Score	114	
Habitat Rating	0.57	
Habitat Stream Condition	Fair	

Narrative:

Highly sinuous with erosion on bends. Historic planform changes apparent but lack of wood makes far less dynamic today

Project: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **7,820**

Phase 2 Reach Summary
 Reach # **T01.06**
 Observers: **J Field/ A. Patmos/P Marangelo**
 Segment Location: **Town of Benson. Tylord Farm property. Reach upstream of Mill Pond.**

page 2 of 2
 Segment: **0**

November 30, 2006
 Completion Date: **June 2, 2005**
 Rain: **No**

1.6 Grade Controls

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Instream	0.00	Yes	No	Yes	Yes
Problem Deposition Above, Scour Below					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	14		No
Total Score	62		
Geomorphic Rating	0.775		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	3	
6.2 Pool Substrate	8	
6.3 Pool Variability	8	
6.4 Sediment Deposition	8	
6.5 Channel Flow Status	15	
6.6 Channel Alteration	15	
6.7 Channel Sinuosity	18	
6.8 Bank Stability	Left: 9	Right: 9
6.9 Bank Vegetation Protection	Left: 5	Right: 5
6.10 Riparian Vegetation Zone Width	Left: 7	Right: 7
Total Score	117	
Habitat Rating	0.585	
Habitat Stream Condition	Fair	

Narrative:

In equilibrium with abundant oxbows- possible minor straightening with accompanying widening. Wood in channel means connection to floodplain good.

Project: **Poultney - Hubbardton River**
 Stream: **Hubbardton**
 Organization: **Field Geology Services**
 Segment Length (ft): **7,350**

Phase 2 Reach Summary
 Reach # **T01.07**
 Observers: **J Field/ A. Patmos/P Marangelo**
 Segment Location: **Off of Lake Hortonia Rd. in Benson.**

page 2 of 2
 Segment: **0**
 Completion Date: **August 4, 2005**
 Rain: **No**

1.6 Grade Controls **None**

Type	Location	Total	Total Height Above Water (ft)	Photo Taken	GPSTaken
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4.8 Channel Constrictions

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?
Old	0.00 Problem	No	No	Yes	Yes

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Unconfined		
	Score	STD	Historic
7.1 Channel Degradation	17	None	Yes
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	17		No
7.4 Change in Planform	14		No
Total Score	64		
Geomorphic Rating	0.8		
Channel Evolution Model	F		
Channel Evolution Stage	III		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Step 6. Rapid Habitat Assessment Data

Stream Gradient Type	Low	
	Score	
6.1 Epifaunal Substrate - Available Cover	8	
6.2 Pool Substrate	10	
6.3 Pool Variability	8	
6.4 Sediment Deposition	11	
6.5 Channel Flow Status	11	
6.6 Channel Alteration	16	
6.7 Channel Sinuosity	14	
6.8 Bank Stability	Left: 6	Right: 6
6.9 Bank Vegetation Protection	Left: 6	Right: 6
6.10 Riparian Vegetation Zone Width	Left: 5	Right: 5
Total Score	112	
Habitat Rating	0.56	
Habitat Stream Condition	Fair	

Narrative:
 Slightly incised due to wood removal but recovering with woody debris jams and beaver dams. Floodplain connection is returning. Introduction of wood allows reconnection without complete widening and aggradation phases of channel evolution.