Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **311**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M01**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 1000 feet southwest of Three Mile Bridge Rd and ends at the confluence with the Otter Creek.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.96949**

1.3 Downstream Longitude: **-73.15682**

Step 2. Stream Type

2.1 Elevation Upstream: **347**
2.1 Elevation Downstream: **345**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,334.0** ft. **0.63** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **5,034.0** ft. **0.95** Miles
2.5 Channel Slope: **0.04 %**
2.6 Sinuosity: **1.51**
2.7 Watershed Area: **62.8** Square Miles
2.8 Channel Width: **81.0** feet
2.9 Valley Width: **1,426.0** feet
2.10 Confinement Ratio: **17.6**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **E**
Bedform: **Dune-Ripple**
Sub-Class Slope: **None**
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Flat**
3.4 Valley Slope Right: **Flat**
3.5 Soils
Hydrologic Group: **C** **61.3** %
Flooding: **Frequent** **80.4** %
Water Table Deep: **1.5** **61.3** %
Water Table Shallow: **0.0** **61.3** %
Erodibility: **slight** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Field**
Current Dominant Land Cover: **Forest** **80.6** %
Current Sub-Dominant Land Cover: **Field**

4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **44.9** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**51-100**	**26-50**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**99.0** ft.	**1,496.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **56.4** **1.1** %
Left: **56.4** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **Dredging**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **344.2** ft. **6.8**

	One Side	Both Sides
Road:	**344.2** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **39.1** ft.
6.3 Channel Bars: **Point**
6.4 Meander Migration: **Neck Cutoff**
6.5 Meander Width: **448 ft.** Rato: **5.5**
6.6 Wavelength: **779 ft.** Ratio: **9.6**

Step 7. Windshield Survey

7.1 Bank Erosion: **1288.5700684** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	2 High	1 Low	12

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **311**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M02**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 1500 ft southwest of Three Mile Bridge Rd, starting near Shard Villa Rd bridge crossing.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.96370**

1.3 Downstream Longitude: **-73.14709**

Step 2. Stream Type

2.1 Elevation Upstream: **349**
2.1 Elevation Downstream: **347**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,166.0** ft. **0.41** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **4,119.0** ft. **0.78** Miles
2.5 Channel Slope: **0.05 %**
2.6 Sinuosity: **1.90**
2.7 Watershed Area: **62.6** Square Miles
2.8 Channel Width: **80.9** feet
2.9 Valley Width: **1,720.0** feet
2.10 Confinement Ratio: **21.3**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **E**
Bedform: **Dune-Ripple**
Sub-Class Slope: **None**
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **68.3** %
3.3 Sub-dom. Geological Mat.: **Glacial Lake**
3.4 Valley Slope Left: **Flat**
3.4 Valley Slope Right: **Flat**
3.5 Soils
Hydrologic Group: **B** **61.1** %
Flooding: **Occasional** **44.0** %
Water Table Deep: **3.0** **52.2** %
Water Table Shallow: **1.5** **68.1** %
Erodibility: **Moderate** **31.6** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Field**
Current Dominant Land Cover: **Forest** **80.8** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover:: **Field**
Current Dominant Land Cover: **Field** **35.5** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**51-100**	**26-50**
Sub-dominant:	**26-50**	**51-100**
Length w / less than 25 ft.:	**255.0** ft.	**287.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **835.4** **20.3** %
Left: **81.9** ft. Right: **753.5** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **3,600.1** ft. **87.4**

	One Side	Both Sides
Road:	**584.5** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**3,015.7** ft.	**0.0** ft.

6.2 Development: **116.4** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **326 ft.** Rato: **4.0**
6.6 Wavelength: **513 ft.** Ratio: **6.3**

Step 7. Windshield Survey

7.1 Bank Erosion: **1018.4899902** ft
7.2 Bank Height: **6** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	1 Low	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	1 Low	1 Low	1 Low	1 Low	2 High	1 Low	14

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **311**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M03**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows north from Blake Roy Rd bridge crossing parallel to and within 1000 ft west of Blake Roy Rd, ending just downstream of the Shard Villa Rd bridge crossing.**

1.2 Towns: **Middlebury, Salisbury**

1.3 Downstream Latitude: **43.96167**

1.3 Downstream Longitude: **-73.13902**

Step 2. Stream Type

2.1 Elevation Upstream:	**354**		
2.1 Elevation Downstream:	**349**		
2.1 Is Gradient Gentle?:	**#Error**		
2.2 Valley Length:	**3,608.0** ft.	**0.68**	Miles
2.3 Valley Slope:	**0.1**		
2.4 Channel Length:	**6,032.0** ft.	**1.14**	Miles
2.5 Channel Slope:	**0.08 %**		
2.6 Sinuosity:	**1.67**		
2.7 Watershed Area:	**62.5** Square Miles		
2.8 Channel Width:	**80.8** feet		
2.9 Valley Width:	**950.0** feet		
2.10 Confinement Ratio:	**11.8**		
2.10 Confinement Type:	**Very Broad**		
2.11 Reference Stream Type:	**E**		
Bedform:	**Dune-Ripple**		
Sub-Class Slope:	**None**		
Bed Material:	**Sand**		

Step 3. Basin Charateristicts

3.1 Alluvial Fan:	**None**	
3.2 Grade Control:	**Multiple**	
3.3 Dominant Geological Mat.:	**Alluvial**	**69.0** %
3.3 Sub-dom. Geological Mat.:	**Glacial Lake**	
3.4 Valley Slope Left:	**Very Steep**	
3.4 Valley Slope Right:	**Flat**	
3.5 Soils		
Hydrologic Group:	**B**	**68.0** %
Flooding:	**Occasional**	**49.3** %
Water Table Deep:	**3.0**	**69.4** %
Water Table Shallow:	**1.5**	**49.3** %
Erodibility:	**Moderate**	**27.1** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated. Impacts for Steps 6.5, 6.6 data should be considered with caution due to substantial lateral bedrock control on planform.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed

Historic Land Cover:	**Field**	
Current Dominant Land Cover:	**Forest**	**80.9** %
Current Sub-Dominant Land Cover:	**Field**	

4.2 Corridor

Historic Land Cover::	**Shrub**	
Current Dominant Land Cover:	**Forest**	**26.7** %
Current Sub-Dominant Land Cover:	**Crop**	

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**26-50**
Sub-dominant:	**26-50**	**>100**
Length w / less than 25 ft.:	**311.0** ft.	**1,228.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):

Type: **None**

Use:

5.2 Bridges and Culverts:	**2**	**5.8** %
5.3 Bank Armoring:	**1,831.3**	**30.4** %
Left: **696.0** ft.	Right:	**1,135.3** ft.
5.4 Channel Straightening:	**0.0**	**0.0** %
5.5 Dredging History:	**None**	

Step 6. Floodplain Modifications

6.1 Berms & Roads - old:	**2,726.4** ft.	**45.2**
	One Side	Both Sides
Road:	**2,013.3** ft.	**713.1** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.
6.2 Development:	**378.2** ft.	**156.4** ft.

6.3 Channel Bars: **Multiple**

6.4 Meander Migration: **Neck Cutoff**

6.5 Meander Width: **287 ft.** Rato: **3.6**

6.6 Wavelength: **852 ft.** Ratio: **10.5**

Step 7. Windshield Survey

7.1 Bank Erosion: **543.0999756** ft

7.2 Bank Height: **6** ft

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

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	2 High	1 Low	1 Low	1 Low	1 Low	0 N.S.	1 Low	1 Low	16

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **311**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M04**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows south, parallel to and within 2000 feet east of Blake Roy Rd, ending at the Halnon Brook confluence near the Blake Roy Rd bridge crossing.**

1.2 Towns: **Middlebury, Salisbury**

1.3 Downstream Latitude: **43.95288**

1.3 Downstream Longitude: **-73.13416**

Step 2. Stream Type

2.1 Elevation Upstream: **359**
2.1 Elevation Downstream: **354**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,844.0** ft. **0.73** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **7,507.0** ft. **1.42** Miles
2.5 Channel Slope: **0.07 %**
2.6 Sinuosity: **1.95**
2.7 Watershed Area: **52.0** Square Miles
2.8 Channel Width: **74.5** feet
2.9 Valley Width: **3,230.0** feet
2.10 Confinement Ratio: **43.3**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **E**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **61.5** %
3.3 Sub-dom. Geological Mat.: **Glacial Lake**
3.4 Valley Slope Left: **Flat**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **B** **54.2** %
Flooding: **Frequent** **38.6** %
Water Table Deep: **6.0** **46.7** %
Water Table Shallow: **4.0** **31.3** %
Erodibility: **slight** **15.5** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated. Impacts for Steps 6.5, 6.6 data should be considered with caution due to substantial lateral bedrock control on planform.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Field**
Current Dominant Land Cover: **Forest** **84.9** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover:: **Field**
Current Dominant Land Cover: **Forest** **25.0** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**26-50**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**1,047.0** ft.	**1,548.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **981.3** **13.1** %
Left: **73.7** ft. Right: **907.6** ft.
5.4 Channel Straightening: **667.8** **8.9** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **710.3** ft. **9.5**

	One Side	Both Sides
Road:	**611.2** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**99.1** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **123.8** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **582 ft.** Rato: **7.8**
6.6 Wavelength: **419 ft.** Ratio: **5.6**

Step 7. Windshield Survey

7.1 Bank Erosion: **3206.2700195** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	1 Low	1 Low	0 N.S.	1 Low	0 N.S.	2 High	2 High	0 N.S.	2 High	2 High	1 Low	17

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **311, 411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M05**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 500 ft south of Three Mile Bridge Rd in vicinity of the VAST trail (Moses R. Cameron) bridge crossing.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.96155**

1.3 Downstream Longitude: **-73.12828**

Step 2. Stream Type

2.1 Elevation Upstream: **365**
2.1 Elevation Downstream: **359**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,484.0** ft. **0.47** Miles
2.3 Valley Slope: **0.2**
2.4 Channel Length: **4,126.0** ft. **0.78** Miles
2.5 Channel Slope: **0.15 %**
2.6 Sinuosity: **1.66**
2.7 Watershed Area: **51.4** Square Miles
2.8 Channel Width: **74.1** feet
2.9 Valley Width: **2,920.0** feet
2.10 Confinement Ratio: **39.4**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **82.1** %
3.3 Sub-dom. Geological Mat.: **Glacial Lake**
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **B** **82.1** %
Flooding: **Occasional** **82.1** %
Water Table Deep: **3.0** **93.6** %
Water Table Shallow: **1.5** **82.1** %
Erodibility: **slight** **11.9** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated. Impacts for Steps 6.5, 6.6 data should be considered with caution due to substantial lateral bedrock control on planform.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Field**
Current Dominant Land Cover: **Forest** **85.5** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover:: **Shrub**
Current Dominant Land Cover: **Forest** **35.2** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**26-50**
Length w / less than 25 ft.:	**145.0** ft.	**189.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **1.2** %
5.3 Bank Armoring: **556.9** **13.5** %
Left: **73.7** ft. Right: **483.2** ft.
5.4 Channel Straightening: **1,018.5** **24.7** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,738.1** ft. **42.1**

	One Side	Both Sides
Road:	**1,738.1** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **262.2** ft. **25.3** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **299 ft.** Rato: **4.0**
6.6 Wavelength: **590 ft.** Ratio: **8.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **1799.1099854** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	2 High	1 Low	2 High	2 High	1 Low	1 Low	2 High	1 Low	19

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M06**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and south of Ossie Rd and Three Mile Bridge Rd, crossing VT Rt 7 near the downstream 1/4 of the reach.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.96426**

1.3 Downstream Longitude: **-73.12071**

Step 2. Stream Type

2.1 Elevation Upstream: **405**
2.1 Elevation Downstream: **365**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **5,828.0** ft. **1.10** Miles
2.3 Valley Slope: **0.7**
2.4 Channel Length: **6,899.0** ft. **1.31** Miles
2.5 Channel Slope: **0.58 %**
2.6 Sinuosity: **1.18**
2.7 Watershed Area: **46.4** Square Miles
2.8 Channel Width: **70.9** feet
2.9 Valley Width: **1,640.0** feet
2.10 Confinement Ratio: **23.1**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Other** **34.6** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Flat**
3.5 Soils
Hydrologic Group: **Not Rated** **34.6** %
Flooding: **Frequent** **34.6** %
Water Table Deep: **3.0** **49.1** %
Water Table Shallow: **1.5** **32.5** %
Erodibility: **slight** **20.7** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **89.9** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **39.0** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**140.0** ft.	**144.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **4.3** %
5.3 Bank Armoring: **1,567.6** **22.7** %
Left: **684.3** ft. Right: **883.2** ft.
5.4 Channel Straightening: **4,628.1** **67.1** %
5.5 Dredging History: **Dredging**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,160.9** ft. **31.3**

	One Side	Both Sides
Road:	**378.6** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**1,782.3** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **722.4** ft. **119.1** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **371 ft.** Rato: **5.2**
6.6 Wavelength: **1214 ft.** Ratio: **17.1**

Step 7. Windshield Survey

7.1 Bank Erosion: **2771.4399414** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	2 High	2 High	2 High	2 High	1 Low	2 High	2 High	0 N.S.	2 High	2 High	1 Low	21

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M07**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 1000 ft south of VT Route 125 (Main Street, East Middlebury) from vicinity of Lower Plains Rd bridge crossing downstream to Goodro Lumber.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.97010**

1.3 Downstream Longitude: **-73.10190**

Step 2. Stream Type

2.1 Elevation Upstream:	**463**		
2.1 Elevation Downstream:	**405**		
2.1 Is Gradient Gentle?:	**#Error**		
2.2 Valley Length:	**3,075.0** ft.	**0.58**	Miles
2.3 Valley Slope:	**1.9**		
2.4 Channel Length:	**3,176.0** ft.	**0.60**	Miles
2.5 Channel Slope:	**1.83 %**		
2.6 Sinuosity:	**1.03**		
2.7 Watershed Area:	**45.4** Square Miles		
2.8 Channel Width:	**70.2** feet		
2.9 Valley Width:	**1,870.0** feet		
2.10 Confinement Ratio:	**26.6**		
2.10 Confinement Type:	**Very Broad**		
2.11 Reference Stream Type:	**C**		
Bedform:	**Riffle-Pool**		
Sub-Class Slope:	**None**		
Bed Material:	**Cobble**		

Step 3. Basin Charateristicts

3.1 Alluvial Fan:	**Yes**	
3.2 Grade Control:	**None**	
3.3 Dominant Geological Mat.:	**Ice-Contact**	**81.6** %
3.3 Sub-dom. Geological Mat.:	**Other**	
3.4 Valley Slope Left:	**Very Steep**	
3.4 Valley Slope Right:	**Ext. Steep**	
3.5 Soils		
Hydrologic Group:	**A**	**60.4** %
Flooding:	**None/Rare**	**81.6** %
Water Table Deep:	**6.0**	**60.4** %
Water Table Shallow:	**6.0**	**60.4** %
Erodibility:	**slight**	%

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed

Historic Land Cover:	**Forest**	
Current Dominant Land Cover:	**Forest**	**90.5** %
Current Sub-Dominant Land Cover:	**Urban**	

4.2 Corridor

Historic Land Cover::	**Residential**	
Current Dominant Land Cover:	**Forest**	**36.7** %
Current Sub-Dominant Land Cover:	**Field**	

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**26-50**
Length w / less than 25 ft.:	**250.0** ft.	**401.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):

Type: **None**
Use:

5.2 Bridges and Culverts:	**1**	**6.3** %	
5.3 Bank Armoring:	**2,180.0**	**68.6** %	
Left:	**1,138.7** ft.	Right:	**1,041.3** ft.
5.4 Channel Straightening:	**1,212.3**	**38.2** %	
5.5 Dredging History:	**Dredging**		

Step 6. Floodplain Modifications

6.1 Berms & Roads - old:	**2,624.4** ft.	**82.6**
	One Side	Both Sides
Road:	**547.2** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**1,212.8** ft.	**0.0** ft.
Improved Path:	**864.4** ft.	**0.0** ft.
6.2 Development:	**870.0** ft.	**993.2** ft.
6.3 Channel Bars:	**Multiple**	
6.4 Meander Migration:	**Multiple**	
6.5 Meander Width:	**230 ft.** Rato:	**3.3**
6.6 Wavelength:	**1185 ft.** Ratio:	**16.9**

Step 7. Windshield Survey

7.1 Bank Erosion:	**1307.8399658**	ft
7.2 Bank Height:	**4**	ft
7.3 Ice/Debris Jam Potential:	**Bridge**	

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	2 High	2 High	2 High	2 High	1 Low	2 High	1 Low	2 High	2 High	1 Low	25

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M08**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 250 ft south of VT Rt 125 through East Middlebury village from just upstream of the VT Rt 125 arch crossing (gorge) downstream to the Lower Plains Rd bridge crossing.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.97044**

1.3 Downstream Longitude: **-73.09158**

Step 2. Stream Type

2.1 Elevation Upstream:	**510**		
2.1 Elevation Downstream:	**463**		
2.1 Is Gradient Gentle?:	**#Error**		
2.2 Valley Length:	**2,017.0** ft.	**0.38**	Miles
2.3 Valley Slope:	**2.3**		
2.4 Channel Length:	**2,043.0** ft.	**0.39**	Miles
2.5 Channel Slope:	**2.30 %**		
2.6 Sinuosity:	**1.01**		
2.7 Watershed Area:	**44.6** Square Miles		
2.8 Channel Width:	**69.6** feet		
2.9 Valley Width:	**790.0** feet		
2.10 Confinement Ratio:	**11.3**		
2.10 Confinement Type:	**Very Broad**		
2.11 Reference Stream Type:	**C**		
Bedform:	**Step-Pool**		
Sub-Class Slope:	**b**		
Bed Material:	**Cobble**		

Step 3. Basin Charateristicts

3.1 Alluvial Fan:	**Yes**	
3.2 Grade Control:	**Multiple**	
3.3 Dominant Geological Mat.:	**Ice-Contact**	**94.8** %
3.3 Sub-dom. Geological Mat.:	**Till**	
3.4 Valley Slope Left:	**Ext. Steep**	
3.4 Valley Slope Right:	**Ext. Steep**	
3.5 Soils		
Hydrologic Group:	**A**	**94.8** %
Flooding:	**None/Rare**	**100.0** %
Water Table Deep:	**6.0**	**100.0** %
Water Table Shallow:	**6.0**	**94.8** %
Erodibility:	**Moderate**	**31.1** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2007 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.4, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed

Historic Land Cover:	**Forest**	
Current Dominant Land Cover:	**Forest**	**90.8** %
Current Sub-Dominant Land Cover:	**Urban**	

4.2 Corridor

Historic Land Cover::	**Forest**	
Current Dominant Land Cover:	**Urban**	**36.7** %
Current Sub-Dominant Land Cover:	**Forest**	

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**51-100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**173.0** ft.	**492.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):

Type: **None**
Use:

5.2 Bridges and Culverts:	**2**	**19.6** %	
5.3 Bank Armoring:	**530.2**	**26.0** %	
Left:	**275.6** ft.	Right:	**254.7** ft.
5.4 Channel Straightening:	**0.0**	**0.0** %	
5.5 Dredging History:	**None**		

Step 6. Floodplain Modifications

6.1 Berms & Roads - old:	**1,761.8** ft.	**86.2**
	One Side	Both Sides
Road:	**1,644.6** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**117.2** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.
6.2 Development:	**765.3** ft.	**313.6** ft.
6.3 Channel Bars:	**None**	
6.4 Meander Migration:	**None**	
6.5 Meander Width:	**N/A** Rato:	**0.0**
6.6 Wavelength:	**N/A** Ratio:	**0.0**

Step 7. Windshield Survey

7.1 Bank Erosion:	**70.0400009**	ft
7.2 Bank Height:	**5**	ft
7.3 Ice/Debris Jam Potential:	**Bridge**	

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	1 Low	13

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M09**
SGAT Version: **4.56**
Date Last Edited: **March, 08 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 1000 ft northwest of VT Rt 125, ending just above the VT Rt 125 arch crossing near intersection with North Branch Rd. Middlebury Gorge.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.97038**

1.3 Downstream Longitude: **-73.08398**

Step 2. Stream Type

2.1 Elevation Upstream: **700**
2.1 Elevation Downstream: **510**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: ft. **0.00** Miles
2.3 Valley Slope: **0.0**
2.4 Channel Length: **3,596.0** ft. **0.68** Miles
2.5 Channel Slope: **5.28 %**
2.6 Sinuosity: **0.00**
2.7 Watershed Area: **44.3** Square Miles
2.8 Channel Width: **69.5** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type:
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **a**
Bed Material: **Boulder**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Other** **71.2** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **Not Rated** **71.2** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **28.8** %
Water Table Shallow: **6.0** **28.4** %
Erodibility: **Moderate** **25.7** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.8** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **62.7** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **466.5** ft. **13.0**

	One Side	Both Sides
Road:	**466.5** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **ft.** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **High** ft
7.3 Ice/Debris Jam Potential: **No Data**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N.D.	0 N.S.	0 N.S.	3

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M10**
SGAT Version: **4.56**
Date Last Edited: **March, 03 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 300 ft northwest of VT Rt 125, starting at the North Branch confluence. Middlebury Gorge.**

1.2 Towns: **Middlebury**

1.3 Downstream Latitude: **43.97321**

1.3 Downstream Longitude: **-73.07237**

Step 2. Stream Type

2.1 Elevation Upstream: **790**
2.1 Elevation Downstream: **700**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: ft. **0.00** Miles
2.3 Valley Slope: **0.0**
2.4 Channel Length: **2,842.0** ft. **0.54** Miles
2.5 Channel Slope: **3.17 %**
2.6 Sinuosity: **0.00**
2.7 Watershed Area: **43.3** Square Miles
2.8 Channel Width: **68.8** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type:
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Ice-Contact** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **A** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.8** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **54.5** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	3

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M11**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 20 to 200 ft north of VT Rt 125, starting downstream of the VT Rt 125 box culvert crossing at the west end of Ripton village and ending at the North Branch confluence.**

1.2 Towns: **Middlebury, Ripton**

1.3 Downstream Latitude: **43.97508**

1.3 Downstream Longitude: **-73.06217**

Step 2. Stream Type

2.1 Elevation Upstream: **978**
2.1 Elevation Downstream: **790**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **6,651.0** ft. **1.26** Miles
2.3 Valley Slope: **2.8**
2.4 Channel Length: **6,722.0** ft. **1.27** Miles
2.5 Channel Slope: **2.80 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **29.1** Square Miles
2.8 Channel Width: **57.7** feet
2.9 Valley Width: **100.0** feet
2.10 Confinement Ratio: **1.7**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Multiple**
3.3 Dominant Geological Mat.: **Ice-Contact** **93.3** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **A** **93.3** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **93.3** %
Erodibility: **Very Severe** **99.9** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2003 Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated. Step 6.5, 6.6 data were deleted and "Not Applicable" was selected due to bedrock lateral / vertical controls and slope >2%. Reversed a previous designation of Modified Reference Stream Type.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.4** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Commercial**
Current Dominant Land Cover: **Forest** **53.2** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**>100**
Sub-dominant:	**>100**	**None**
Length w / less than 25 ft.:	**2,813.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **2,662.2** **39.6** %
Left: **2,662.2** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **5,286.3** ft. **78.6**

	One Side	Both Sides
Road:	**5,286.3** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **76.0899963** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	1 Low	0 N.S.	0 N/A	0 N/A	0 N.S.	1 Low	11

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M12**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows through Ripton village, parallel to and crossing VT Rt 125. Starts at the confluence of Middle Branch and South Branch, and ends downstream of the VT Rt 125 box culvert crossing at the west end of Ripton village.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.97494**

1.3 Downstream Longitude: **-73.04194**

Step 2. Stream Type

2.1 Elevation Upstream:	**1,060**		
2.1 Elevation Downstream:	**978**		
2.1 Is Gradient Gentle?:	**#Error**		
2.2 Valley Length:	**2,198.0** ft.	**0.42**	Miles
2.3 Valley Slope:	**3.7**		
2.4 Channel Length:	**2,419.0** ft.	**0.46**	Miles
2.5 Channel Slope:	**3.39 %**		
2.6 Sinuosity:	**1.10**		
2.7 Watershed Area:	**28.0** Square Miles		
2.8 Channel Width:	**56.8** feet		
2.9 Valley Width:	feet		
2.10 Confinement Ratio:	**0.0**		
2.10 Confinement Type:	**Narrow**		
2.11 Reference Stream Type:	**C**		
Bedform:	**Step-Pool**		
Sub-Class Slope:	**b**		
Bed Material:	**Boulder**		

Step 3. Basin Charateristicts

3.1 Alluvial Fan:	**None**	
3.2 Grade Control:	**Waterfall**	
3.3 Dominant Geological Mat.:	**Ice-Contact**	**79.1** %
3.3 Sub-dom. Geological Mat.:	**Till**	
3.4 Valley Slope Left:	**Very Steep**	
3.4 Valley Slope Right:	**Very Steep**	
3.5 Soils		
Hydrologic Group:	**A**	**79.1** %
Flooding:	**None/Rare**	**100.0** %
Water Table Deep:	**6.0**	**100.0** %
Water Table Shallow:	**6.0**	**79.1** %
Erodibility:	**Severe**	**52.1** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2003 Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated. Reversed a previous designation of Modified Reference Stream Type. Gorge section not accessed in entirety - viewed only from upstream end and from downstream end.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed

Historic Land Cover:	**Forest**	
Current Dominant Land Cover:	**Forest**	**91.4** %
Current Sub-Dominant Land Cover:	**Urban**	

4.2 Corridor

Historic Land Cover::	**Residential**	
Current Dominant Land Cover:	**Forest**	**40.2** %
Current Sub-Dominant Land Cover:	**Urban**	

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**51-100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**697.0** ft.	**533.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):

Type: **None**

Use:

5.2 Bridges and Culverts:	**1**	**4.1** %
5.3 Bank Armoring:	**350.4**	**14.5** %
Left: **31.0** ft.	Right:	**319.4** ft.
5.4 Channel Straightening:	**0.0**	**0.0** %
5.5 Dredging History:	**None**	

Step 6. Floodplain Modifications

6.1 Berms & Roads - old:	**1,176.9** ft.	**48.7**
	One Side	Both Sides
Road:	**1,176.9** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.
6.2 Development:	**751.0** ft.	**148.1** ft.
6.3 Channel Bars:	**Multiple**	
6.4 Meander Migration:	**Flood Chute**	
6.5 Meander Width:	**N/A** Rato:	**0.0**
6.6 Wavelength:	**N/A** Ratio:	**0.0**

Step 7. Windshield Survey

7.1 Bank Erosion:	**600.7699585**	ft
7.2 Bank Height:	**5**	ft
7.3 Ice/Debris Jam Potential:	**Culvert**	

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	2 High	2 High	1 Low	1 Low	0 N/A	0 N/A	2 High	1 Low	15

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M13**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Starts just northwest of Ira Dow Rd intersection with Wagon Wheel Rd, and flows downstream crossing under Wagon Wheel Rd, Peddlars Bridge Rd, Natural Turnpike, and VT Rt 125 to end at the confluence of South Branch Middlebury River.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.97387**

1.3 Downstream Longitude: **-73.03490**

Step 2. Stream Type

2.1 Elevation Upstream: **1,253**
2.1 Elevation Downstream: **1,060**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **5,711.0** ft. **1.08** Miles
2.3 Valley Slope: **3.4**
2.4 Channel Length: **6,961.0** ft. **1.32** Miles
2.5 Channel Slope: **2.77 %**
2.6 Sinuosity: **1.22**
2.7 Watershed Area: **11.6** Square Miles
2.8 Channel Width: **38.5** feet
2.9 Valley Width: **160.0** feet
2.10 Confinement Ratio: **4.2**
2.10 Confinement Type: **Narrow**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **b**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **52.3** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **A** **44.9** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **52.8** %
Water Table Shallow: **6.0** **44.9** %
Erodibility: **Severe** **60.3** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 Phase 2 field observations (SMRC and USFS) and limited field observations in 2007-2008 (SMRC) - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.5** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **49.1** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**596.0** ft.	**487.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **5** **9.6** %
5.3 Bank Armoring: **624.5** **9.0** %
Left: **398.1** ft. Right: **226.5** ft.
5.4 Channel Straightening: **792.2** **11.4** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **618.2** ft. **8.9**

	One Side	Both Sides
Road:	**275.9** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**342.3** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **766.0** ft. **198.4** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **2162.5500488** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	1 Low	1 Low	1 Low	0 N.S.	1 Low	1 Low	2 High	2 High	0 N/A	0 N/A	2 High	2 High	17

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M14**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel and to the north of Wagon Wheel Road - extending approximately 2/3 mile upstream of Ira Dow Rd intersection with Wagon Wheel Rd.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.97566**

1.3 Downstream Longitude: **-73.01539**

Step 2. Stream Type

2.1 Elevation Upstream: **1,370**
2.1 Elevation Downstream: **1,253**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,141.0** ft. **0.59** Miles
2.3 Valley Slope: **3.7**
2.4 Channel Length: **3,912.0** ft. **0.74** Miles
2.5 Channel Slope: **2.99 %**
2.6 Sinuosity: **1.25**
2.7 Watershed Area: **6.0** Square Miles
2.8 Channel Width: **28.8** feet
2.9 Valley Width: **100.0** feet
2.10 Confinement Ratio: **3.5**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Multiple**
3.3 Dominant Geological Mat.: **Till** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Ext. Steep**
3.5 Soils
Hydrologic Group: **B** **88.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **88.0** %
Water Table Shallow: **2.0** **88.0** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 Phase 2 field observations (SMRC and USFS) - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated. Dam remnants noted as vertical grade control in Step 3.2 do not impound the channel significantly, beyond what would be characteristic of a typical pool in this steep gradient step-pool system. Therefore, the dam remnants were not FIT'd as a flow regulation.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **93.2** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **70.5** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **1.3** %
5.3 Bank Armoring: **31.3** **0.8** %
Left: **0.0** ft. Right: **31.3** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **877.6199951** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	1 Low	1 Low	0 N/A	0 N/A	2 High	1 Low	5

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **411, 511**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M15**
SGAT Version: **4.56**
Date Last Edited: **February, 28 2009**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel and to the north of Wagon Wheel Rd (class 4) in Green Mountain National Forest. Extends approx 1/2 mile downstream of terminus of Wagon Wheel Rd at former log landing (and bridge).**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.97688**

1.3 Downstream Longitude: **-73.00505**

Step 2. Stream Type

2.1 Elevation Upstream: **1,461**
2.1 Elevation Downstream: **1,370**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,491.0** ft. **0.47** Miles
2.3 Valley Slope: **3.7**
2.4 Channel Length: **2,902.0** ft. **0.55** Miles
2.5 Channel Slope: **3.14 %**
2.6 Sinuosity: **1.16**
2.7 Watershed Area: **5.5** Square Miles
2.8 Channel Width: **27.8** feet
2.9 Valley Width: **70.0** feet
2.10 Confinement Ratio: **2.5**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **b**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **67.4** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **C** **86.3** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **2.5** **53.7** %
Water Table Shallow: **1.5** **53.7** %
Erodibility: **Severe** **67.4** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 Phase 2 field observations (SMRC and USFS) - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated. Step 6.5, 6.6 data were deleted and "Not Applicable" was selected due to slope >2%. Reversed a previous designation of Modified Reference Stream Type. High Debris Jam potential selected due to history of washout of Wagon Wheel Rd bridge crossing (from Rch 16) which washed downstream and created a de

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **93.2** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **77.2** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**None**
Length w / less than 25 ft.:	**327.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **287.2** **9.9** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **809.0** ft. **27.9**

	One Side	Both Sides
Road:	**809.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Point**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **678.8500366** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	0 N.S.	0 N.S.	1 Low	0 N/A	0 N/A	2 High	2 High	9

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **511 - Breadloaf**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M16**
SGAT Version: **4.56**
Date Last Edited: **March, 01 2009**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located in Green Mountain National Forest. Reach above end of Wagon Wheel Rd.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **43.97937**
1.3 Downstream Longitude: **-72.99646**

Step 2. Stream Type

2.1 Elevation Upstream: **1,568**
2.1 Elevation Downstream: **1,461**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,020.0** ft. **0.57** Miles
2.3 Valley Slope: **3.5**
2.4 Channel Length: **3,259.0** ft. **0.62** Miles
2.5 Channel Slope: **3.28 %**
2.6 Sinuosity: **1.08**
2.7 Watershed Area: **5.3** Square Miles
2.8 Channel Width: **27.3** feet
2.9 Valley Width: **47.0** feet
2.10 Confinement Ratio: **1.7**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **95.9** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **C** **98.8** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **1.0** **95.9** %
Water Table Shallow: **0.0** **95.9** %
Erodibility: **slight** **4.1** %
7.4 Comments:

Updated in 2009 (SMRC), based on limited field observations in 2008 to supplement 2002 assessment.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **93.2** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **70.6** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**734.0** ft.	**269.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **6.9** %
5.3 Bank Armoring: **103.5** **3.2** %
Left: **54.0** ft. Right: **49.5** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,177.7** ft. **36.1**

	One Side	Both Sides
Road:	**455.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**722.8** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **139.5** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **1060.6900635** ft
7.2 Bank Height: **1** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	0 N.S.	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	2 High	2 High	0 N/A	0 N/A	2 High	2 High	13

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **511 - Breadloaf**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M17**
SGAT Version: **4.56**
Date Last Edited: **March, 01 2009**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located in Green Mountain National Forest.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **43.97971**
1.3 Downstream Longitude: **-72.98621**

Step 2. Stream Type

2.1 Elevation Upstream: **1,710**
2.1 Elevation Downstream: **1,568**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,088.0** ft. **0.58** Miles
2.3 Valley Slope: **4.6**
2.4 Channel Length: **3,609.0** ft. **0.68** Miles
2.5 Channel Slope: **3.93 %**
2.6 Sinuosity: **1.17**
2.7 Watershed Area: **2.7** Square Miles
2.8 Channel Width: **20.2** feet
2.9 Valley Width: **27.0** feet
2.10 Confinement Ratio: **1.3**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **93.3** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Steep**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **A** **68.7** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **71.4** %
Water Table Shallow: **6.0** **68.7** %
Erodibility: **Severe** **67.7** %
7.4 Comments:

Updated in 2009 (SMRC), based on limited field observations in 2008 to supplement 2002 assessment.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **94.5** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **56.1** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **788.0200195** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	2 High	2 High	0 N/A	0 N/A	2 High	1 Low	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **511 - Breadloaf**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M18**
SGAT Version: **4.56**
Date Last Edited: **March, 01 2009**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located in Green Mountain National Forest.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **43.98177**
1.3 Downstream Longitude: **-72.97528**

Step 2. Stream Type

2.1 Elevation Upstream: **1,895**
2.1 Elevation Downstream: **1,710**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,710.0** ft. **0.32** Miles
2.3 Valley Slope: **10.8**
2.4 Channel Length: **4,382.0** ft. **0.83** Miles
2.5 Channel Slope: **4.22 %**
2.6 Sinuosity: **2.56**
2.7 Watershed Area: **2.4** Square Miles
2.8 Channel Width: **19.3** feet
2.9 Valley Width: **30.0** feet
2.10 Confinement Ratio: **1.6**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **a**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **95.6** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **A** **95.6** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **95.6** %
Water Table Shallow: **6.0** **95.6** %
Erodibility: **Very Severe** **90.0** %
7.4 Comments:

Updated in 2009 (SMRC), based on limited field observations in 2008 to supplement 2002 assessment.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **94.6** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **48.6** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **634.8800049** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	2 High	2 High	0 N/A	0 N/A	1 Low	1 Low	6

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Middlebury River**
Topo Maps: **511 - Breadloaf**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M19**
SGAT Version: **4.56**
Date Last Edited: **March, 01 2009**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Crosses Steam Mill Rd**

1.1 Reach Description:

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.98809**

1.3 Downstream Longitude: **-72.96775**

Step 2. Stream Type

2.1 Elevation Upstream: **2,103**
2.1 Elevation Downstream: **1,895**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,688.0** ft. **0.70** Miles
2.3 Valley Slope: **5.6**
2.4 Channel Length: **4,091.0** ft. **0.77** Miles
2.5 Channel Slope: **5.08 %**
2.6 Sinuosity: **1.11**
2.7 Watershed Area: **1.0** Square Miles
2.8 Channel Width: **14.5** feet
2.9 Valley Width: **28.0** feet
2.10 Confinement Ratio: **1.9**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **a**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **56.4** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **B** **56.4** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **2.0** **56.4** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Updated in 2009 (SMRC), based on limited field observations in 2008 to supplement 2003 assessment.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **96.2** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **56.6** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**51.0** ft.	**65.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **2.8** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **57.7** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **956.9699707** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	1 Low	2 High	0 N/A	0 N/A	2 High	1 Low	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Unnamed trib to Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **M3S1.01**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Crosses 3 mile bridge rd .3 miles east of Farmingdale.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.96174**
1.3 Downstream Longitude: **-73.13597**

Step 2. Stream Type

2.1 Elevation Upstream: **438**
2.1 Elevation Downstream: **351**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: ft. **0.00** Miles
2.3 Valley Slope: **0.0**
2.4 Channel Length: **5,923.0** ft. **1.12** Miles
2.5 Channel Slope: **1.47 %**
2.6 Sinuosity: **0.00**
2.7 Watershed Area: **0.4** Square Miles
2.8 Channel Width: **8.6** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type:
2.11 Reference Stream Type: **C**
Bedform: **Plane Bed**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **99.9** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **99.9** %
Flooding: **None/Rare** **81.1** %
Water Table Deep: **3.0** **77.3** %
Water Table Shallow: **1.0** **77.2** %
Erodibility: **Very Severe** **77.2** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Field** **64.8** %
Current Sub-Dominant Land Cover: **Forest**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Field** **38.5** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**51-100**	**>100**
Sub-dominant:	**>100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **4.6** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **128.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **High** ft
7.3 Ice/Debris Jam Potential: **Culvert**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	1 Low	1 Low	5

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.01**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins at Power line crossing and ends at conf with Midd River.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.95281**
1.3 Downstream Longitude: **-73.13421**

Step 2. Stream Type

2.1 Elevation Upstream: **355**
2.1 Elevation Downstream: **354**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,109.0** ft. **0.40** Miles
2.3 Valley Slope: **0.0**
2.4 Channel Length: **2,367.0** ft. **0.45** Miles
2.5 Channel Slope: **0.04 %**
2.6 Sinuosity: **1.12**
2.7 Watershed Area: **9.8** Square Miles
2.8 Channel Width: **35.8** feet
2.9 Valley Width: **565.0** feet
2.10 Confinement Ratio: **15.8**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Alluvial** **97.5** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **82.4** %
Flooding: **Frequent** **97.5** %
Water Table Deep: **1.5** **82.4** %
Water Table Shallow: **0.0** **82.4** %
Erodibility: **slight** **0.3** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **63.2** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Wetland** **53.4** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**51-100**
Length w / less than 25 ft.:	**47.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **125 ft.** Rato: **3.5**
6.6 Wavelength: **183 ft.** Ratio: **5.1**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	1 Low	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	1 Low	1 Low	2 High	0 N.S.	0 N.S.	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.02**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Ends just east of Power line crossing east of Blake Roy Rd.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.95200**
1.3 Downstream Longitude: **-73.12845**

Step 2. Stream Type

2.1 Elevation Upstream: **356**
2.1 Elevation Downstream: **355**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,011.0** ft. **0.19** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **1,278.0** ft. **0.24** Miles
2.5 Channel Slope: **0.08 %**
2.6 Sinuosity: **1.26**
2.7 Watershed Area: **9.7** Square Miles
2.8 Channel Width: **35.6** feet
2.9 Valley Width: **1,475.0** feet
2.10 Confinement Ratio: **41.4**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Alluvial** **84.2** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **84.2** %
Flooding: **Frequent** **84.2** %
Water Table Deep: **1.5** **84.2** %
Water Table Shallow: **0.0** **84.2** %
Erodibility: **slight** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **63.7** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **45.4** %
Current Sub-Dominant Land Cover: **Wetland**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**1,073.0** ft.	**984.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **1,212.4** **94.9** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **Avulsion**
6.5 Meander Width: **35 ft.** Rato: **1.0**
6.6 Wavelength: **35 ft.** Ratio: **1.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 Unk.	0 N.S.	0 N.S.	2 High	2 High	2 High	0 N.S.	0 N.S.	13

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.03**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located .4 to .6 miles South on Rt 7 from Salisbury town line.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.94902**
1.3 Downstream Longitude: **-73.12625**

Step 2. Stream Type

2.1 Elevation Upstream: **357**
2.1 Elevation Downstream: **356**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,693.0** ft. **0.32** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **2,047.0** ft. **0.39** Miles
2.5 Channel Slope: **0.05 %**
2.6 Sinuosity: **1.21**
2.7 Watershed Area: **9.5** Square Miles
2.8 Channel Width: **35.2** feet
2.9 Valley Width: **902.0** feet
2.10 Confinement Ratio: **25.6**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Alluvial** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **100.0** %
Flooding: **Frequent** **100.0** %
Water Table Deep: **1.5** **100.0** %
Water Table Shallow: **0.0** **100.0** %
Erodibility: **slight** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **64.4** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Wetland** **61.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**2,047.0** ft.	**2,047.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **88 ft.** Rato: **2.5**
6.6 Wavelength: **236 ft.** Ratio: **6.7**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	0 N.S.	2 High	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.04**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located west of Rt 7 in Salisbury in wetland area.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.94611**
1.3 Downstream Longitude: **-73.12303**

Step 2. Stream Type

2.1 Elevation Upstream: **359**
2.1 Elevation Downstream: **357**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,637.0** ft. **0.31** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **2,164.0** ft. **0.41** Miles
2.5 Channel Slope: **0.09 %**
2.6 Sinuosity: **1.32**
2.7 Watershed Area: **6.8** Square Miles
2.8 Channel Width: **30.4** feet
2.9 Valley Width: **1,267.0** feet
2.10 Confinement Ratio: **41.7**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **B**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Alluvial** **98.6** %
3.3 Sub-dom. Geological Mat.: **Glacial Lake**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **98.6** %
Flooding: **Frequent** **98.6** %
Water Table Deep: **1.5** **98.6** %
Water Table Shallow: **0.0** **98.6** %
Erodibility: **slight** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **71.7** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Wetland** **59.5** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**2,164.0** ft.	**1,774.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	5

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.05**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located west of Rt 7 near intersection with Salisbury Plains Rd.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.94175**
1.3 Downstream Longitude: **-73.12061**

Step 2. Stream Type

2.1 Elevation Upstream: **360**
2.1 Elevation Downstream: **359**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,812.0** ft. **0.34** Miles
2.3 Valley Slope: **0.1**
2.4 Channel Length: **2,105.0** ft. **0.40** Miles
2.5 Channel Slope: **0.05 %**
2.6 Sinuosity: **1.16**
2.7 Watershed Area: **6.6** Square Miles
2.8 Channel Width: **30.1** feet
2.9 Valley Width: **2,158.0** feet
2.10 Confinement Ratio: **71.7**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **66.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **66.0** %
Flooding: **None/Rare** **66.0** %
Water Table Deep: **1.0** **47.6** %
Water Table Shallow: **0.5** **47.6** %
Erodibility: **slight** **18.4** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **72.7** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **64.5** %
Current Sub-Dominant Land Cover: **Wetland**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**0-25**
Length w / less than 25 ft.:	**0.0** ft.	**715.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **109 ft.** Rato: **3.6**
6.6 Wavelength: **296 ft.** Ratio: **9.9**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	2 High	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	4

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.06**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins just west of Rt 7 and Rt 53 intersection and ends West of Rt 7 from intersection with Salisbury Plains Rd.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.93758**
1.3 Downstream Longitude: **-73.11811**

Step 2. Stream Type

2.1 Elevation Upstream: **378**
2.1 Elevation Downstream: **360**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,194.0** ft. **0.60** Miles
2.3 Valley Slope: **0.6**
2.4 Channel Length: **4,050.0** ft. **0.77** Miles
2.5 Channel Slope: **0.44 %**
2.6 Sinuosity: **1.27**
2.7 Watershed Area: **5.9** Square Miles
2.8 Channel Width: **28.6** feet
2.9 Valley Width: **929.0** feet
2.10 Confinement Ratio: **32.5**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **1.0** **88.3** %
Water Table Shallow: **0.5** **92.8** %
Erodibility: **slight** **7.2** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **75.2** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Wetland** **28.6** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**3,726.0** ft.	**4,050.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **124 ft.** Rato: **4.3**
6.6 Wavelength: **166 ft.** Ratio: **5.8**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	2 High	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.07**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins at intersection of Kelly Cross Rd and Rt 7. Ends west of Rt 7 from intersection with Rt 53.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.93105**
1.3 Downstream Longitude: **-73.11199**

Step 2. Stream Type

2.1 Elevation Upstream: **420**
2.1 Elevation Downstream: **378**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,249.0** ft. **0.62** Miles
2.3 Valley Slope: **1.3**
2.4 Channel Length: **3,889.0** ft. **0.74** Miles
2.5 Channel Slope: **1.08 %**
2.6 Sinuosity: **1.20**
2.7 Watershed Area: **0.7** Square Miles
2.8 Channel Width: **11.4** feet
2.9 Valley Width: **820.0** feet
2.10 Confinement Ratio: **72.1**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **66.6** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **3.0** **55.4** %
Water Table Shallow: **1.0** **55.4** %
Erodibility: **Severe** **57.6** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **45.4** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Field** **18.1** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**26-50**	**>100**
Length w / less than 25 ft.:	**2,177.0** ft.	**1,983.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **3.1** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **206.8** ft. **5.3**

	One Side	Both Sides
Road:	**206.8** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **Migration**
6.5 Meander Width: **109 ft.** Rato: **9.6**
6.6 Wavelength: **351 ft.** Ratio: **30.9**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	2 High	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	2 High	1 Low	2 High	0 N.S.	0 N.S.	14

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1.08**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Crosses Kelly Cross Rd.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.92152**
1.3 Downstream Longitude: **-73.11271**

Step 2. Stream Type

2.1 Elevation Upstream: **460**
2.1 Elevation Downstream: **420**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,624.0** ft. **0.31** Miles
2.3 Valley Slope: **2.5**
2.4 Channel Length: **1,970.0** ft. **0.37** Miles
2.5 Channel Slope: **2.03 %**
2.6 Sinuosity: **1.21**
2.7 Watershed Area: **0.4** Square Miles
2.8 Channel Width: **9.2** feet
2.9 Valley Width: **582.0** feet
2.10 Confinement Ratio: **63.2**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **53.7** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **53.7** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **3.0** **60.7** %
Water Table Shallow: **1.5** **35.8** %
Erodibility: **Severe** **71.2** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **59.7** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **33.9** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**26-50**	**>100**
Length w / less than 25 ft.:	**394.0** ft.	**1,162.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **9.1** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **48.0** ft. **2.4**

	One Side	Both Sides
Road:	**48.0** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **112.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **Migration**
6.5 Meander Width: **90 ft.** Rato: **9.8**
6.6 Wavelength: **304 ft.** Ratio: **33.0**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **Low** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	1 Low	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	1 Low	1 Low	2 High	0 N.S.	0 N.S.	11

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Unnamed trib to Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1S1.01**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located East of intersection of Middle Rd and Columbus Smith rd.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.94766**
1.3 Downstream Longitude: **-73.12601**

Step 2. Stream Type

2.1 Elevation Upstream: **357**
2.1 Elevation Downstream: **356**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,568.0** ft. **0.49** Miles
2.3 Valley Slope: **0.0**
2.4 Channel Length: **3,431.0** ft. **0.65** Miles
2.5 Channel Slope: **0.03 %**
2.6 Sinuosity: **1.34**
2.7 Watershed Area: **1.6** Square Miles
2.8 Channel Width: **16.2** feet
2.9 Valley Width: **1,497.0** feet
2.10 Confinement Ratio: **92.6**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Alluvial** **94.0** %
3.3 Sub-dom. Geological Mat.: **Glacial Lake**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **94.0** %
Flooding: **Frequent** **94.0** %
Water Table Deep: **1.5** **97.8** %
Water Table Shallow: **0.0** **97.8** %
Erodibility: **slight** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **51.4** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Forest** **73.7** %
Current Sub-Dominant Land Cover: **Wetland**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **2,438.3** **71.1** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **97.0** ft.
6.3 Channel Bars: **Mid-channel**
6.4 Meander Migration: **None**
6.5 Meander Width: **16 ft.** Rato: **1.0**
6.6 Wavelength: **16 ft.** Ratio: **1.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 Unk.	0 N.S.	1 Low	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	9

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Unnamed trib to Hanlon Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T1S1.02**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Parallels Middle Rd to the East.**

1.1 Reach Description:
1.2 Towns: **Salisbury**
1.3 Downstream Latitude: **43.93925**
1.3 Downstream Longitude: **-73.12927**

Step 2. Stream Type

2.1 Elevation Upstream: **374**
2.1 Elevation Downstream: **357**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **7,351.0** ft. **1.39** Miles
2.3 Valley Slope: **0.2**
2.4 Channel Length: **7,460.0** ft. **1.41** Miles
2.5 Channel Slope: **0.23 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **1.4** Square Miles
2.8 Channel Width: **15.2** feet
2.9 Valley Width: **1,404.0** feet
2.10 Confinement Ratio: **92.5**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **96.3** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **96.3** %
Flooding: **None/Rare** **97.1** %
Water Table Deep: **1.0** **81.1** %
Water Table Shallow: **0.0** **84.0** %
Erodibility: **slight** **3.4** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Forest** **50.1** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Wetland** **40.3** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**7,460.0** ft.	**7,460.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **2.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **7,058.0** **94.6** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **15 ft.** Rato: **1.0**
6.6 Wavelength: **15 ft.** Ratio: **1.0**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **Low** ft
7.3 Ice/Debris Jam Potential: **Culvert**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	1 Low	12

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Beaver Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T2.01**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins at tributary confluence from the North and crosses Three Mile Bridge Rd. Crosses under Rt 125.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.96609**
1.3 Downstream Longitude: **-73.12367**

Step 2. Stream Type

2.1 Elevation Upstream: **384**
2.1 Elevation Downstream: **362**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,197.0** ft. **0.61** Miles
2.3 Valley Slope: **0.7**
2.4 Channel Length: **7,454.0** ft. **1.41** Miles
2.5 Channel Slope: **0.30 %**
2.6 Sinuosity: **2.33**
2.7 Watershed Area: **4.7** Square Miles
2.8 Channel Width: **25.9** feet
2.9 Valley Width: **1,797.0** feet
2.10 Confinement Ratio: **69.3**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **E**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Alluvial** **95.5** %
3.3 Sub-dom. Geological Mat.: **Glacial Lake**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **C** **88.1** %
Flooding: **Frequent** **92.2** %
Water Table Deep: **1.5** **88.1** %
Water Table Shallow: **0.0** **88.1** %
Erodibility: **slight** **4.5** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Field**
Current Dominant Land Cover: **Forest** **45.5** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover:: **Field**
Current Dominant Land Cover: **Forest** **51.1** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**51-100**	**>100**
Length w / less than 25 ft.:	**298.0** ft.	**5,366.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **7.5** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **693.3** ft. **9.3**

	One Side	Both Sides
Road:	**693.3** ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **348.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **89 ft.** Rato: **3.4**
6.6 Wavelength: **136 ft.** Ratio: **5.3**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **Low** ft
7.3 Ice/Debris Jam Potential: **Bend**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	2 High	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	11

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Beaver Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T2.02**
SGAT Version: **4.56**
Date Last Edited: **August, 14 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Crosses Rt 116 .5 miles North of East Middlebury.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.97930**
1.3 Downstream Longitude: **-73.11422**

Step 2. Stream Type

2.1 Elevation Upstream: **459**
2.1 Elevation Downstream: **384**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,963.0** ft. **0.94** Miles
2.3 Valley Slope: **1.5**
2.4 Channel Length: **5,868.0** ft. **1.11** Miles
2.5 Channel Slope: **1.28 %**
2.6 Sinuosity: **1.18**
2.7 Watershed Area: **2.7** Square Miles
2.8 Channel Width: **20.3** feet
2.9 Valley Width: **634.0** feet
2.10 Confinement Ratio: **31.2**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Plane Bed**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Ice-Contact** **50.3** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **A** **50.3** %
Flooding: **None/Rare** **70.6** %
Water Table Deep: **6.0** **67.4** %
Water Table Shallow: **6.0** **67.4** %
Erodibility: **Severe** **58.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Field**
Current Dominant Land Cover: **Forest** **61.4** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover:: **Field**
Current Dominant Land Cover: **Forest** **52.7** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**1,290.0** ft.	**1,995.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **4.4** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **153.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **127 ft.** Rato: **6.3**
6.6 Wavelength: **322 ft.** Ratio: **15.8**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **High** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	1 Low	2 High	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	1 Low	0 N.S.	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Beaver Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T2.03**
SGAT Version: **4.56**
Date Last Edited: **August, 14 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Crosses unnamed road that intersects Airport Rd and Rt 125 east of Rt 116.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.98011**
1.3 Downstream Longitude: **-73.09570**

Step 2. Stream Type

2.1 Elevation Upstream: **519**
2.1 Elevation Downstream: **459**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,948.0** ft. **0.37** Miles
2.3 Valley Slope: **3.1**
2.4 Channel Length: **2,196.0** ft. **0.42** Miles
2.5 Channel Slope: **2.73 %**
2.6 Sinuosity: **1.13**
2.7 Watershed Area: **0.7** Square Miles
2.8 Channel Width: **10.9** feet
2.9 Valley Width: **292.0** feet
2.10 Confinement Ratio: **26.8**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Ice-Contact** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **A** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Very Severe** **81.7** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **80.9** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover:: **Commercial**
Current Dominant Land Cover: **Field** **28.2** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**0-25**
Length w / less than 25 ft.:	**241.0** ft.	**351.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **3** **17.3** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **262.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **90 ft.** Rato: **8.3**
6.6 Wavelength: **387 ft.** Ratio: **35.5**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **High** ft
7.3 Ice/Debris Jam Potential: **Culvert**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	0 Unk.	0 Unk.	0 N.S.	0 Unk.	1 Low	0 N.S.	0 N.S.	1 Low	2 High	1 Low	2 High	13

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Unnamed trib to Beaver Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T2S1.01**
SGAT Version: **4.56**
Date Last Edited: **August, 14 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins just South of intersection with Cady Rd. Ends at confluence with Beaver Brook.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.97940**
1.3 Downstream Longitude: **-73.11430**

Step 2. Stream Type

2.1 Elevation Upstream: **399**
2.1 Elevation Downstream: **384**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,114.0** ft. **0.40** Miles
2.3 Valley Slope: **0.7**
2.4 Channel Length: **2,546.0** ft. **0.48** Miles
2.5 Channel Slope: **0.59 %**
2.6 Sinuosity: **1.20**
2.7 Watershed Area: **1.5** Square Miles
2.8 Channel Width: **15.8** feet
2.9 Valley Width: **664.0** feet
2.10 Confinement Ratio: **42.0**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **97.0** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **97.0** %
Flooding: **None/Rare** **97.0** %
Water Table Deep: **1.0** **74.1** %
Water Table Shallow: **0.5** **74.1** %
Erodibility: **slight** **22.9** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Field** **36.2** %
Current Sub-Dominant Land Cover: **Crop**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Urban** **17.1** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**2,546.0** ft.	**2,546.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **75 ft.** Rato: **4.7**
6.6 Wavelength: **186 ft.** Ratio: **11.8**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	2 High	2 High	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Unnamed trib to Beaver Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T2S1.02**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located North of intersecting Cody Rd and parallels east of Foote Rd.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.98471**
1.3 Downstream Longitude: **-73.11756**

Step 2. Stream Type

2.1 Elevation Upstream: **419**
2.1 Elevation Downstream: **399**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,590.0** ft. **0.68** Miles
2.3 Valley Slope: **0.6**
2.4 Channel Length: **4,403.0** ft. **0.83** Miles
2.5 Channel Slope: **0.45 %**
2.6 Sinuosity: **1.23**
2.7 Watershed Area: **1.3** Square Miles
2.8 Channel Width: **14.7** feet
2.9 Valley Width: **687.0** feet
2.10 Confinement Ratio: **46.7**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Sand**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **3.0** **96.7** %
Water Table Shallow: **1.0** **96.7** %
Erodibility: **Very Severe** **96.7** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Crop** **34.0** %
Current Sub-Dominant Land Cover: **Field**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Field** **24.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**3,038.0** ft.	**4,050.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **6.8** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **271.8** **6.2** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **0.0** ft. **102.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **53 ft.** Rato: **3.6**
6.6 Wavelength: **143 ft.** Ratio: **9.7**

Step 7. Windshield Survey

7.1 Bank Erosion: ft
7.2 Bank Height: **High** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	2 High	2 High	0 N.S.	1 Low	0 N.S.	1 Low	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	0 N.S.	11

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **Unnamed trib to Beaver Brook**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T2S1.03**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located .6 miles East of Foote Street cemetery.**

1.1 Reach Description:
1.2 Towns: **Middlebury**
1.3 Downstream Latitude: **43.99421**
1.3 Downstream Longitude: **-73.12086**

Step 2. Stream Type

2.1 Elevation Upstream: **425**
2.1 Elevation Downstream: **419**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,101.0** ft. **0.40** Miles
2.3 Valley Slope: **0.3**
2.4 Channel Length: **2,241.0** ft. **0.42** Miles
2.5 Channel Slope: **0.27 %**
2.6 Sinuosity: **1.07**
2.7 Watershed Area: **1.0** Square Miles
2.8 Channel Width: **12.8** feet
2.9 Valley Width: **779.0** feet
2.10 Confinement Ratio: **60.6**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Dune-Ripple**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan:
3.2 Grade Control:
3.3 Dominant Geological Mat.: **Glacial Lake** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left:
3.4 Valley Slope Right:
3.5 Soils
Hydrologic Group: **D** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **1.0** **77.1** %
Water Table Shallow: **0.0** **77.1** %
Erodibility: **slight** **22.9** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover:
Current Dominant Land Cover: **Crop** **35.0** %
Current Sub-Dominant Land Cover: **Forest**
4.2 Corridor
Historic Land Cover::
Current Dominant Land Cover: **Field** **33.2** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**0-25**	**0-25**
Sub-dominant:	**>100**	**>100**
Length w / less than 25 ft.:	**2,241.0** ft.	**2,241.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **4.5** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **2,217.1** **98.9** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	ft.	ft.
Railroad:	ft.	ft.
Berm:	ft.	ft.
Improved Path:	ft.	ft.

6.2 Development: **76.0** ft. **0.0** ft.
6.3 Channel Bars: **None**
6.4 Meander Migration: **None**
6.5 Meander Width: **12 ft.** Rato: **1.0**
6.6 Wavelength: **12 ft.** Ratio: **1.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **No Data** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
2 High	2 High	2 High	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	12

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.01**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Located from 1.3 to 2.1 miles up North Branch Rd from the intersection with Rt 125.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **43.97517**
1.3 Downstream Longitude: **-73.06228**

Step 2. Stream Type

2.1 Elevation Upstream: **912**
2.1 Elevation Downstream: **788**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,981.0** ft. **0.56** Miles
2.3 Valley Slope: **4.2**
2.4 Channel Length: **3,028.0** ft. **0.57** Miles
2.5 Channel Slope: **4.10 %**
2.6 Sinuosity: **1.02**
2.7 Watershed Area: **14.0** Square Miles
2.8 Channel Width: **41.9** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **A**
Bedform: **Step-Pool**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Ice-Contact** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Ext. Steep**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **A** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **89.8** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **50.9** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	2

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.02**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Begins SE of intersection of North Branch Rd and Dugway Rd. Ends south of North Branch Rd .5 mi west of intersection with Dugway Rd.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.97854**

1.3 Downstream Longitude: **-73.05404**

Step 2. Stream Type

2.1 Elevation Upstream: **1,009**
2.1 Elevation Downstream: **912**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,652.0** ft. **0.69** Miles
2.3 Valley Slope: **2.7**
2.4 Channel Length: **3,736.0** ft. **0.71** Miles
2.5 Channel Slope: **2.60 %**
2.6 Sinuosity: **1.02**
2.7 Watershed Area: **13.4** Square Miles
2.8 Channel Width: **41.0** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **A** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **89.8** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **53.1** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **Not Evaluated** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	1

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.03**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins where crossing Dugway Rd. Ends SE of intersection of North Branch Rd and Dugway Rd.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **43.98493**
1.3 Downstream Longitude: **-73.04672**

Step 2. Stream Type

2.1 Elevation Upstream: **1,070**
2.1 Elevation Downstream: **1,009**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,394.0** ft. **0.45** Miles
2.3 Valley Slope: **2.5**
2.4 Channel Length: **2,402.0** ft. **0.45** Miles
2.5 Channel Slope: **2.54 %**
2.6 Sinuosity: **1.00**
2.7 Watershed Area: **12.3** Square Miles
2.8 Channel Width: **39.6** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope:
Bed Material: **Boulder**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Multiple**
3.3 Dominant Geological Mat.: **Ice-Contact** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **A** **100.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **100.0** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **89.8** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **34.0** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **2.5** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **59.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **Low** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	1 Low	4

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.04**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Begins west of Lincoln Rd .6 miles North of Lincoln Rd and Robbins Cross Rd intersection. Ends at crossing Dugway Rd.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.98874**

1.3 Downstream Longitude: **-73.03986**

Step 2. Stream Type

2.1 Elevation Upstream: **1,165**
2.1 Elevation Downstream: **1,070**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,330.0** ft. **0.63** Miles
2.3 Valley Slope: **2.9**
2.4 Channel Length: **3,678.0** ft. **0.70** Miles
2.5 Channel Slope: **2.58 %**
2.6 Sinuosity: **1.10**
2.7 Watershed Area: **11.7** Square Miles
2.8 Channel Width: **38.6** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope:
Bed Material: **Boulder**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Multiple**
3.3 Dominant Geological Mat.: **Ice-Contact** **93.6** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **A** **93.6** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **6.0** **93.6** %
Erodibility: **Very Severe** **99.6** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **89.9** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **30.7** %
Current Sub-Dominant Land Cover: **Field**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**51-100**
Length w / less than 25 ft.:	**110.0** ft.	**294.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **4.9** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **218.4** ft. **5.9**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **50.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **30.0000000** ft
7.2 Bank Height: **Low** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	4

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.05**
SGAT Version: **4.56**
Date Last Edited: **August, 09 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Parallels Lincoln Rd to the west. Located from .6 to 1 mile North of Lincoln Rd and Robbin Cross Rd intersection.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.99365**

1.3 Downstream Longitude: **-73.03249**

Step 2. Stream Type

2.1 Elevation Upstream: **1,212**
2.1 Elevation Downstream: **1,165**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,085.0** ft. **0.39** Miles
2.3 Valley Slope: **2.3**
2.4 Channel Length: **2,096.0** ft. **0.40** Miles
2.5 Channel Slope: **2.24 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **9.8** Square Miles
2.8 Channel Width: **35.7** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrowly Confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope:
Bed Material: **Not Evaluated**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Multiple**
3.3 Dominant Geological Mat.: **Ice-Contact** **77.4** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **A** **77.4** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **77.4** %
Water Table Shallow: **6.0** **77.4** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.7** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **47.1** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History:

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **217.0** ft. **0.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **30.0000000** ft
7.2 Bank Height: **1** ft
7.3 Ice/Debris Jam Potential: **Not Evaluated**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 Unk.	0 N.S.	0 Unk.	1 Low	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	2

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.06**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Parallels and crosses Lincoln Rd. Located from 1 to 1.6 miles North on Lincoln Rd from the intersection with Robins Cross rd.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.99751**

1.3 Downstream Longitude: **-73.02690**

Step 2. Stream Type

2.1 Elevation Upstream: **1,279**
2.1 Elevation Downstream: **1,212**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,459.0** ft. **0.66** Miles
2.3 Valley Slope: **1.9**
2.4 Channel Length: **3,646.0** ft. **0.69** Miles
2.5 Channel Slope: **1.84 %**
2.6 Sinuosity: **1.05**
2.7 Watershed Area: **9.5** Square Miles
2.8 Channel Width: **35.3** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrow**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **D** **66.7** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **2.0** **66.7** %
Water Table Shallow: **0.0** **66.7** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.7** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Residential**
Current Dominant Land Cover: **Urban** **39.1** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**0-25**	**>100**
Length w / less than 25 ft.:	**911.0** ft.	**1,677.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **6.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,827.9** ft. **77.6**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **81.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **140 ft.** Rato: **4.0**
6.6 Wavelength: **1218 ft.** Ratio: **34.5**

Step 7. Windshield Survey

7.1 Bank Erosion: **35.0000000** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	11

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.07**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Located East of Lincoln Rd. Located from .75 to 1.3 miles South on Lincoln Rd from the intersection with North Branch Rd.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **44.00401**

1.3 Downstream Longitude: **-73.01926**

Step 2. Stream Type

2.1 Elevation Upstream: **1,309**
2.1 Elevation Downstream: **1,279**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,913.0** ft. **0.55** Miles
2.3 Valley Slope: **1.0**
2.4 Channel Length: **2,951.0** ft. **0.56** Miles
2.5 Channel Slope: **1.02 %**
2.6 Sinuosity: **1.01**
2.7 Watershed Area: **8.4** Square Miles
2.8 Channel Width: **33.4** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Broad**
2.11 Reference Stream Type: **B**
Bedform: **Plane Bed**
Sub-Class Slope: **c**
Bed Material: **Boulder**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **67.9** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **B** **67.9** %
Flooding: **None/Rare** **76.4** %
Water Table Deep: **6.0** **67.9** %
Water Table Shallow: **2.0** **67.9** %
Erodibility: **Severe** **67.9** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.4** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **40.8** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**0-25**
Sub-dominant:	**51-100**	**51-100**
Length w / less than 25 ft.:	**0.0** ft.	**1,386.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **3.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,422.6** ft. **48.2**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **64.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **71 ft.** Rato: **2.1**
6.6 Wavelength: **29 ft.** Ratio: **0.9**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **Medium** ft
7.3 Ice/Debris Jam Potential: **Bend**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	11

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.08**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Parallels Lincoln rd to the East. Begins at confluence with Alder Brook.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **44.01143**
1.3 Downstream Longitude: **-73.02212**

Step 2. Stream Type

2.1 Elevation Upstream: **1,334**
2.1 Elevation Downstream: **1,309**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **1,599.0** ft. **0.30** Miles
2.3 Valley Slope: **1.6**
2.4 Channel Length: **1,837.0** ft. **0.35** Miles
2.5 Channel Slope: **1.36 %**
2.6 Sinuosity: **1.15**
2.7 Watershed Area: **7.9** Square Miles
2.8 Channel Width: **32.6** feet
2.9 Valley Width: **362.0** feet
2.10 Confinement Ratio: **11.1**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **B**
Bedform: **Plane Bed**
Sub-Class Slope:
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Alluvial** **54.3** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Flat**
3.4 Valley Slope Right: **Flat**
3.5 Soils
Hydrologic Group: **C** **54.3** %
Flooding: **Frequent** **54.3** %
Water Table Deep: **1.5** **54.3** %
Water Table Shallow: **0.0** **58.9** %
Erodibility: **Moderate** **42.9** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.1** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **48.8** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**0-25**
Length w / less than 25 ft.:	**0.0** ft.	**606.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **8.2** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **256.6** ft. **14.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **116.0** ft. **0.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **Medium** ft
7.3 Ice/Debris Jam Potential: **Bend**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	1 Low	1 Low	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	8

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.09**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Begins at intersection of North Branch Rd and Lincoln Rd. Ends at confluence with Alder Brook.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **44.01563**
1.3 Downstream Longitude: **-73.02047**

Step 2. Stream Type

2.1 Elevation Upstream: **1,405**
2.1 Elevation Downstream: **1,334**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,379.0** ft. **0.45** Miles
2.3 Valley Slope: **3.0**
2.4 Channel Length: **2,460.0** ft. **0.47** Miles
2.5 Channel Slope: **2.89 %**
2.6 Sinuosity: **1.03**
2.7 Watershed Area: **4.8** Square Miles
2.8 Channel Width: **26.1** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope:
Bed Material: **Boulder**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Steep**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **B** **89.1** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **89.1** %
Water Table Shallow: **2.0** **89.1** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **89.3** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **42.8** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**51-100**	**0-25**
Length w / less than 25 ft.:	**0.0** ft.	**959.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **5.3** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **735.3** ft. **29.9**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **106.2** ft. **172.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **Medium** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	2 High	1 Low	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	0 N.S.	9

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **North Branch Middlebury River**
Topo Maps:
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T3.10**
SGAT Version: **4.56**
Date Last Edited: **October, 04 2006**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location **Parallels Lincoln Brook Rd North of intersection with North Branch Rd.**

1.1 Reach Description:
1.2 Towns: **Ripton**
1.3 Downstream Latitude: **44.02139**
1.3 Downstream Longitude: **-73.02272**

Step 2. Stream Type

2.1 Elevation Upstream: **1,475**
2.1 Elevation Downstream: **1,405**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,585.0** ft. **0.68** Miles
2.3 Valley Slope: **2.0**
2.4 Channel Length: **3,976.0** ft. **0.75** Miles
2.5 Channel Slope: **1.76 %**
2.6 Sinuosity: **1.11**
2.7 Watershed Area: **4.2** Square Miles
2.8 Channel Width: **24.7** feet
2.9 Valley Width: feet
2.10 Confinement Ratio: **0.0**
2.10 Confinement Type: **Narrow**
2.11 Reference Stream Type: **C**
Bedform: **Plane Bed**
Sub-Class Slope:
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **100.0** %
3.3 Sub-dom. Geological Mat.:
3.4 Valley Slope Left: **Flat**
3.4 Valley Slope Right: **Flat**
3.5 Soils
Hydrologic Group: **D** **81.1** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **2.0** **81.1** %
Water Table Shallow: **0.0** **81.1** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.0** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **47.9** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**51-100**
Length w / less than 25 ft.:	**238.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: ft. Right: ft.
5.4 Channel Straightening: **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **367.1** ft. **0.0** ft.
6.3 Channel Bars: **No Data**
6.4 Meander Migration: **None**
6.5 Meander Width: **76 ft.** Rato: **3.1**
6.6 Wavelength: **401 ft.** Ratio: **16.2**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **High** ft
7.3 Ice/Debris Jam Potential: **None**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	1 Low	0 N.S.	0 N.S.	1 Low	2 High	0 N.S.	0 N.S.	6

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.01**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel and to the southwest of VT Rt 125, from the vicinity of Old Town Rd bridge crossing downstream to confluence with Middle Branch at Ripton village.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.97383**

1.3 Downstream Longitude: **-73.03532**

Step 2. Stream Type

2.1 Elevation Upstream: **1,143**
2.1 Elevation Downstream: **1,065**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **3,432.0** ft. **0.65** Miles
2.3 Valley Slope: **2.3**
2.4 Channel Length: **3,643.0** ft. **0.69** Miles
2.5 Channel Slope: **2.14 %**
2.6 Sinuosity: **1.06**
2.7 Watershed Area: **16.2** Square Miles
2.8 Channel Width: **44.7** feet
2.9 Valley Width: **145.0** feet
2.10 Confinement Ratio: **3.2**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **None**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **58.4** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Steep**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **A** **41.6** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **75.1** %
Water Table Shallow: **6.0** **41.6** %
Erodibility: **Severe** **58.4** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.5** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Residential**
Current Dominant Land Cover: **Urban** **38.0** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**51-100**
Sub-dominant:	**None**	**0-25**
Length w / less than 25 ft.:	**55.0** ft.	**1,278.0** ft.

4.4 Ground Water Inputs: **None**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **2.7** %
5.3 Bank Armoring: **811.3** **22.3** %
Left: **0.0** ft. Right: **811.3** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,897.7** ft. **79.5**

	One Side	Both Sides
Road:	**2,897.7** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **53.0** ft. **34.3** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **None**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **0.0000000** ft
7.2 Bank Height: **No Data** ft
7.3 Ice/Debris Jam Potential: **Bridge**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	2 High	0 N.S.	0 N.S.	0 N.S.	0 N/A	0 N/A	0 N.S.	1 Low	10

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.02**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and southwest of VT Rt 125, east of and crossing under Goshen Rd - from the vicnity of Reichert Rd intersection with VT Rt 125 downstream to vicinity of Old Town Rd bridge crossing.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.96607**

1.3 Downstream Longitude: **-73.03064**

Step 2. Stream Type

2.1 Elevation Upstream: **1,240**
2.1 Elevation Downstream: **1,143**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,022.0** ft. **0.76** Miles
2.3 Valley Slope: **2.4**
2.4 Channel Length: **4,623.0** ft. **0.88** Miles
2.5 Channel Slope: **2.10 %**
2.6 Sinuosity: **1.15**
2.7 Watershed Area: **15.5** Square Miles
2.8 Channel Width: **43.8** feet
2.9 Valley Width: **200.0** feet
2.10 Confinement Ratio: **4.6**
2.10 Confinement Type: **Narrow**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **b**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Waterfall**
3.3 Dominant Geological Mat.: **Ice-Contact** **51.8** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **B** **48.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **52.4** %
Water Table Shallow: **1.5** **33.2** %
Erodibility: **Severe** **63.2** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 (SMRC) and 2001 (USFS) Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated. Step 6.5, 6.6 data were deleted and "Not Applicable" was selected due to bedrock lateral controls and slope >2%.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.8** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **50.7** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**26-50**	**26-50**
Length w / less than 25 ft.:	**230.0** ft.	**132.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **3.2** %
5.3 Bank Armoring: **88.9** **1.9** %
Left: **42.2** ft. Right: **46.7** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **1,598.2** ft. **34.6**

	One Side	Both Sides
Road:	**1,598.2** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **69.7** ft. **35.5** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **875.8800049** ft
7.2 Bank Height: **4** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	1 Low	1 Low	0 N/A	0 N/A	1 Low	1 Low	10

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.03**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and south of VT Rt 125, from the Robert Frost Interpretive Trail footbridge downstream to the vicnity of Reichert Rd intersection with VT Rt 125.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.95923**

1.3 Downstream Longitude: **-73.02164**

Step 2. Stream Type

2.1 Elevation Upstream: **1,275**
2.1 Elevation Downstream: **1,240**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,888.0** ft. **0.55** Miles
2.3 Valley Slope: **1.2**
2.4 Channel Length: **4,134.0** ft. **0.78** Miles
2.5 Channel Slope: **0.85 %**
2.6 Sinuosity: **1.43**
2.7 Watershed Area: **11.5** Square Miles
2.8 Channel Width: **38.4** feet
2.9 Valley Width: **400.0** feet
2.10 Confinement Ratio: **10.4**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **72.0** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Steep**
3.4 Valley Slope Right: **Steep**
3.5 Soils
Hydrologic Group: **B** **95.0** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **69.0** %
Water Table Shallow: **2.0** **69.0** %
Erodibility: **Very Severe** **78.8** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 (SMRC) and 2001 (USFS) Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.9** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Wetland**
Current Dominant Land Cover: **Forest** **58.6** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **232.0** **5.6** %
Left: **232.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **299 ft.** Rato: **7.8**
6.6 Wavelength: **547 ft.** Ratio: **14.3**

Step 7. Windshield Survey

7.1 Bank Erosion: **1334.5699463** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	1 Low	0 N.S.	0 N.S.	0 Unk.	0 N.S.	1 Low	2 High	0 N.S.	1 Low	2 High	1 Low	9

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **411**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.04**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and 300 to 700 ft south of VT Rt 125, from the vicinity of the Galvin Cemetery downstream to the Robert Frost Interpretive Trail footbridge.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.95649**

1.3 Downstream Longitude: **-73.01176**

Step 2. Stream Type

2.1 Elevation Upstream: **1,306**
2.1 Elevation Downstream: **1,275**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,569.0** ft. **0.49** Miles
2.3 Valley Slope: **1.2**
2.4 Channel Length: **3,141.0** ft. **0.59** Miles
2.5 Channel Slope: **0.99 %**
2.6 Sinuosity: **1.22**
2.7 Watershed Area: **11.0** Square Miles
2.8 Channel Width: **37.6** feet
2.9 Valley Width: **725.0** feet
2.10 Confinement Ratio: **19.3**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Ice-Contact** **85.6** %
3.3 Sub-dom. Geological Mat.: **Till**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **C** **61.3** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **1.0** **61.3** %
Water Table Shallow: **0.0** **61.3** %
Erodibility: **slight** **14.8** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 Phase 2 and Phase 3 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.9** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Shrub**
Current Dominant Land Cover: **Forest** **68.4** %
Current Sub-Dominant Land Cover: **Wetland**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**237.0** ft.	**51.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **1** **3.2** %
5.3 Bank Armoring: **52.1** **1.7** %
Left: **32.3** ft. Right: **19.8** ft.
5.4 Channel Straightening: **1,470.4** **46.8** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **379.6** ft. **12.1**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**379.6** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **35.4** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **254 ft.** Rato: **6.8**
6.6 Wavelength: **382 ft.** Ratio: **10.2**

Step 7. Windshield Survey

7.1 Bank Erosion: **1613.0699463** ft
7.2 Bank Height: **3** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	1 Low	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	1 Low	0 N.S.	2 High	2 High	0 N.S.	0 N.S.	2 High	1 Low	12

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **411, 511**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.05**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and 1/4 mile southwest of VT Rt 125, southwest of the intersection with Steam Mill Road, ending near the Galvin Cemetery.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.95514**

1.3 Downstream Longitude: **-73.00241**

Step 2. Stream Type

2.1 Elevation Upstream: **1,336**
2.1 Elevation Downstream: **1,306**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,101.0** ft. **0.40** Miles
2.3 Valley Slope: **1.4**
2.4 Channel Length: **2,165.0** ft. **0.41** Miles
2.5 Channel Slope: **1.39 %**
2.6 Sinuosity: **1.03**
2.7 Watershed Area: **10.3** Square Miles
2.8 Channel Width: **36.6** feet
2.9 Valley Width: **560.0** feet
2.10 Confinement Ratio: **15.3**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **None**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **69.3** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **B** **74.3** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **69.3** %
Water Table Shallow: **2.0** **69.3** %
Erodibility: **Severe** **69.3** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1 -6.4, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **91.8** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **55.0** %
Current Sub-Dominant Land Cover:

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **740.3** **34.2** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **186 ft.** Rato: **5.1**
6.6 Wavelength: **32 ft.** Ratio: **0.9**

Step 7. Windshield Survey

7.1 Bank Erosion: **822.9799805** ft
7.2 Bank Height: **1** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	0 Unk.	0 N.S.	0 N.S.	1 Low	0 N.S.	2 High	2 High	1 Low	9

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **511**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.06**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and 1/4 mile southwest of VT Rt 125 and Breadloaf Campus. Starts downstream of Brooks Rd bridge.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.95059**

1.3 Downstream Longitude: **-72.99780**

Step 2. Stream Type

2.1 Elevation Upstream: **1,393**
2.1 Elevation Downstream: **1,336**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,920.0** ft. **0.55** Miles
2.3 Valley Slope: **2.0**
2.4 Channel Length: **3,331.0** ft. **0.63** Miles
2.5 Channel Slope: **1.71 %**
2.6 Sinuosity: **1.14**
2.7 Watershed Area: **7.9** Square Miles
2.8 Channel Width: **32.4** feet
2.9 Valley Width: **120.0** feet
2.10 Confinement Ratio: **3.7**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Riffle-Pool**
Sub-Class Slope: **c**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **52.4** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **B** **52.4** %
Flooding: **None/Rare** **52.4** %
Water Table Deep: **6.0** **52.4** %
Water Table Shallow: **2.0** **52.4** %
Erodibility: **Severe** **52.4** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2002 and 2003 Phase 2 field observations - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **92.4** %
Current Sub-Dominant Land Cover: **Urban**
4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Forest** **48.2** %
Current Sub-Dominant Land Cover: **Crop**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**None**	**None**
Length w / less than 25 ft.:	**0.0** ft.	**0.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **0.0** **0.0** %
Left: **0.0** ft. Right: **0.0** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **0.0** ft. **0.0**

	One Side	Both Sides
Road:	**0.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Flood Chute**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **842.3400269** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 Unk.	0 N.S.	2 High	1 Low	0 N/A	0 N/A	2 High	1 Low	7

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **511**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.07**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and 500 to 1000 ft southwest of VT Rt 125 from vicinity of a driveway crossing to a point downstream of the Brooks Road bridge crossing.**

1.2 Towns: **Ripton**

1.3 Downstream Latitude: **43.94755**

1.3 Downstream Longitude: **-72.98812**

Step 2. Stream Type

2.1 Elevation Upstream: **1,513**
2.1 Elevation Downstream: **1,393**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **4,016.0** ft. **0.76** Miles
2.3 Valley Slope: **3.0**
2.4 Channel Length: **4,515.0** ft. **0.86** Miles
2.5 Channel Slope: **2.66 %**
2.6 Sinuosity: **1.12**
2.7 Watershed Area: **7.4** Square Miles
2.8 Channel Width: **31.7** feet
2.9 Valley Width: **500.0** feet
2.10 Confinement Ratio: **15.8**
2.10 Confinement Type: **Very Broad**
2.11 Reference Stream Type: **C**
Bedform: **Riffle-Pool**
Sub-Class Slope: **b**
Bed Material: **Gravel**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **Yes**
3.2 Grade Control: **None**
3.3 Dominant Geological Mat.: **Till** **85.5** %
3.3 Sub-dom. Geological Mat.: **Alluvial**
3.4 Valley Slope Left: **Hilly**
3.4 Valley Slope Right: **Hilly**
3.5 Soils
Hydrologic Group: **D** **51.4** %
Flooding: **None/Rare** **92.2** %
Water Table Deep: **2.0** **51.4** %
Water Table Shallow: **0.0** **59.5** %
Erodibility: **Very Severe** **88.8** %

7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **92.6** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Shrub**
Current Dominant Land Cover: **Forest** **44.2** %
Current Sub-Dominant Land Cover: **Urban**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**>100**
Sub-dominant:	**0-25**	**None**
Length w / less than 25 ft.:	**644.0** ft.	**214.0** ft.

4.4 Ground Water Inputs: **Abundant**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **2** **13.3** %
5.3 Bank Armoring: **482.7** **10.7** %
Left: **361.2** ft. Right: **121.5** ft.
5.4 Channel Straightening: **823.9** **18.2** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **514.9** ft. **11.4**

	One Side	Both Sides
Road:	**425.8** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**89.1** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **98.5** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **2124.8200684** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Multiple**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	1 Low	1 Low	0 N.S.	1 Low	1 Low	1 Low	0 N.S.	1 Low	0 N.S.	2 High	2 High	0 N/A	0 N/A	2 High	2 High	15

Middlebury River

Phase 1 - Reach Summary Report

Basin: **Otter, Little Otter, Lewis**
Stream Name: **South Branch Middlebury River**
Topo Maps: **511**
Watershed: **Otter Creek**
Sub-watershed: **Otter Creek -- Furnace Brook to Lemon Fair River**

Reach ID: **T4.08**
SGAT Version: **4.56**
Date Last Edited: **March, 10 2008**
QA Status: **Step 7 done**
Is Reach An Impoundment?: **#Error**

Step 1. Reach Location

1.1 Reach Description: **Flows parallel to and within 150 feet south of VT Rt 125 (at an elevation well below the road). From the vicinity of the Ripton/Hancock town line downstream to a point just upstream of a private driveway bridge crossing.**

1.2 Towns: **Hancock, Ripton**

1.3 Downstream Latitude: **43.94415**

1.3 Downstream Longitude: **-72.97394**

Step 2. Stream Type

2.1 Elevation Upstream: **1,669**
2.1 Elevation Downstream: **1,513**
2.1 Is Gradient Gentle?: **#Error**
2.2 Valley Length: **2,136.0** ft. **0.40** Miles
2.3 Valley Slope: **7.3**
2.4 Channel Length: **2,268.0** ft. **0.43** Miles
2.5 Channel Slope: **6.88 %**
2.6 Sinuosity: **1.06**
2.7 Watershed Area: **1.6** Square Miles
2.8 Channel Width: **16.2** feet
2.9 Valley Width: **45.0** feet
2.10 Confinement Ratio: **2.8**
2.10 Confinement Type: **Semi-confined**
2.11 Reference Stream Type: **B**
Bedform: **Step-Pool**
Sub-Class Slope: **a**
Bed Material: **Cobble**

Step 3. Basin Charateristicts

3.1 Alluvial Fan: **None**
3.2 Grade Control: **Ledge**
3.3 Dominant Geological Mat.: **Till** **92.4** %
3.3 Sub-dom. Geological Mat.: **Ice-Contact**
3.4 Valley Slope Left: **Very Steep**
3.4 Valley Slope Right: **Very Steep**
3.5 Soils
Hydrologic Group: **B** **92.4** %
Flooding: **None/Rare** **100.0** %
Water Table Deep: **6.0** **100.0** %
Water Table Shallow: **2.0** **92.4** %
Erodibility: **Very Severe** **100.0** %
7.4 Comments:

Ph 1 update completed by SMRC in Feb 2008, relying on 2003 Phase 2 field observations and limited field observations in 2007-2008 - specifically, Steps 2.9-2.11, 3.1, 3.2, 3.4, 4.3, 4.4, 5.1-5.5, 6.1-6.6, 7.1-7.2 were updated. Step 6.5, 6.6 data were deleted and "Not Applicable" was selected due to bedrock lateral & vertical controls and slope >2%.

Step 4. Land Cover - Reach Hydrology

4.1 Watershed
Historic Land Cover: **Forest**
Current Dominant Land Cover: **Forest** **90.6** %
Current Sub-Dominant Land Cover: **Urban**

4.2 Corridor
Historic Land Cover:: **Forest**
Current Dominant Land Cover: **Urban** **44.9** %
Current Sub-Dominant Land Cover: **Forest**

4.3 Riparian Buffer	Left Bank	Right Bank
Dominant:	**>100**	**51-100**
Sub-dominant:	**None**	**26-50**
Length w / less than 25 ft.:	**0.0** ft.	**70.0** ft.

4.4 Ground Water Inputs: **Minimal**

Step 5. Instream Channel Modifications

5.1 Flow Regulation - (old):
Type: **None**
Use:
5.2 Bridges and Culverts: **0** **0.0** %
5.3 Bank Armoring: **78.6** **3.5** %
Left: **0.0** ft. Right: **78.6** ft.
5.4 Channel Straightening: **0.0** **0.0** %
5.5 Dredging History: **None**

Step 6. Floodplain Modifications

6.1 Berms & Roads - old: **2,189.0** ft. **96.5**

	One Side	Both Sides
Road:	**2,189.0** ft.	**0.0** ft.
Railroad:	**0.0** ft.	**0.0** ft.
Berm:	**0.0** ft.	**0.0** ft.
Improved Path:	**0.0** ft.	**0.0** ft.

6.2 Development: **0.0** ft. **0.0** ft.
6.3 Channel Bars: **Multiple**
6.4 Meander Migration: **Multiple**
6.5 Meander Width: **N/A** Rato: **0.0**
6.6 Wavelength: **N/A** Ratio: **0.0**

Step 7. Windshield Survey

7.1 Bank Erosion: **450.5599976** ft
7.2 Bank Height: **2** ft
7.3 Ice/Debris Jam Potential: **Debris**

4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.3	Total
1 Low	2 High	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	0 N.S.	2 High	0 N.S.	1 Low	1 Low	0 N/A	0 N/A	1 Low	1 Low	9