

Blanchard Brook, Montpelier, Vermont

Blanchard Brook in Montpelier has been found to be impaired by stormwater runoff quality as measured by the biology of the stream and is on the state's 303d list of impaired waterways. There are at least 12 significant discharges to the stream from the developed lands of Montpelier. The largest discharge to the stream is drainage area #127 which drains a large section of the central watershed. The recommended course of action for stormwater impacted streams is to install a treatment structure that controls both the water quality volume and the channel protection volume from these discharges near the outfall. A map showing the location of the discharges and a possible retrofit location is provided. A cost estimate (excluding land costs) is provided. Since this is a developed area modifying the existing wet ponds to manage these two volumes would be the least disruptive to the landowners. The landowners in drainage areas #121-122 will have to upgrade their discharges to the stream to meet 50% of the water quality volume from the properties although most of the runoff can be treated for sediment removal with drainage areas #3000b. This report also lists smaller improvements for water quality as described in the Stormwater Master Plan for Montpelier by Stone Environmental.

Addressing the large discharges of stormwater to the brook will reduce contamination and stream channel erosion and restore the water quality to Class B. It will also reduce phosphorus currently being discharged to the Winooski River and Lake Champlain.

Table 3: Macroinvertebrate metrics scores and assessment ratings for sampling events at Blanchard Brook RM 0.1 and RM 0.4.

| Date | RM | Lab ID | Density | Richness | EPT Richness | PMA-O | B.I. | Oligo. | EPT/EPT + Chiro | PPCS-F | Community Assessment |
|----------------------|-----|----------|---------|----------|--------------|-------|--------|--------|-----------------|--------|----------------------|
| 8-29-2013 | 0.1 | 2013.003 | 2296 | 49.0 | 19.0 | 77.8 | 4.11 | 0.52 | 0.68 | 0.44 | Good |
| 10-2-2014 | 0.1 | 2014.106 | 1324 | 39.0 | 18.0 | 78.8 | 3.16 | 0.00 | 0.81 | 0.58 | Good/VG |
| 9-21-2015 | 0.1 | 2015.089 | 484 | 36.0 | 18.0 | 79.8 | 3.77 | 0.28 | 0.73 | 0.52 | Good |
| 8-25-2016 | 0.4 | 2016.001 | 323 | 34.0 | 19.0 | 55.6 | 3.03 | 0.31 | 0.97 | 0.42 | Good |
| Full Support | | | ≥ 300 | ≥ 27 | ≥ 16 | ≥ 45 | ≤ 4.5 | ≤ 12 | ≥ 0.45 | ≥ 0.4 | |
| Indeterminate | | | ≥ 250 | ≥ 26 | ≥ 15 | ≥ 40 | ≤ 4.65 | ≤ 14.5 | ≥ 0.43 | ≥ 0.35 | |
| Non-Support | | | < 250 | < 26 | < 15 | < 40 | > 4.65 | > 14.5 | < 0.43 | < 0.35 | |

*Scoring Guidelines for Stream Type SHG and WQ Class B(2).

Table 1: Geographical and land use data for monitoring sites on Blanchard Brook.

| River Mile | Drainage Area (km ²) | Elevation (ft) | % Development | % Agriculture | % Forest | % Wetland |
|------------|----------------------------------|----------------|---------------|---------------|----------|-----------|
| 1.7 | 0.9 | 952 | 7.4 | 44.5 | 48.0 | 0.0 |
| 1.0 | 1.9 | 795 | 11.0 | 38.8 | 50.1 | 0.0 |
| 0.4 | 2.8 | 574 | 18.6 | 29.0 | 51.4 | 0.5 |
| 0.1 | 3.0 | 540 | 19.8 | 29.0 | 49.8 | 0.6 |

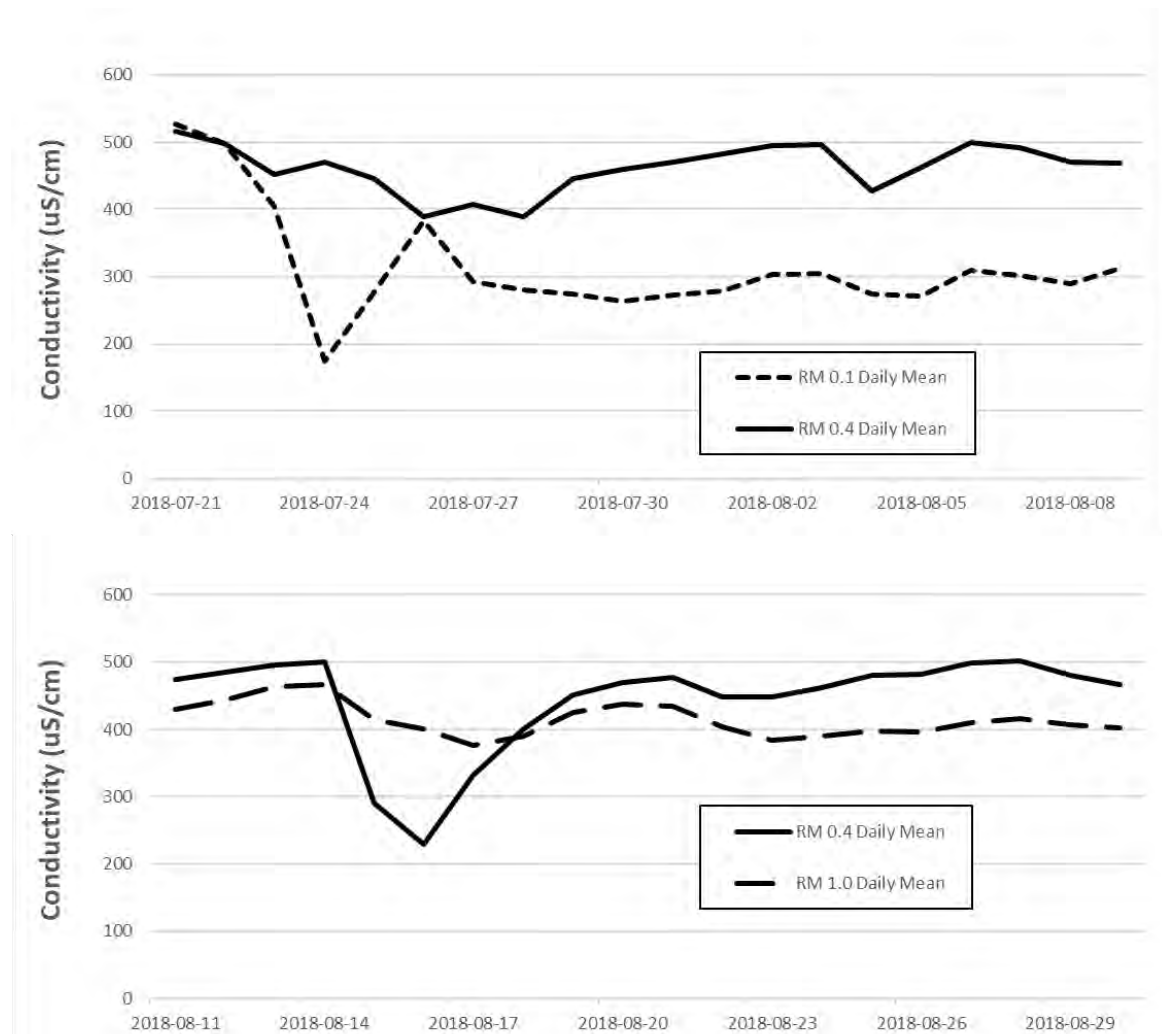


Figure 2: Daily mean conductivity values for paired stations on Blanchard Brook.

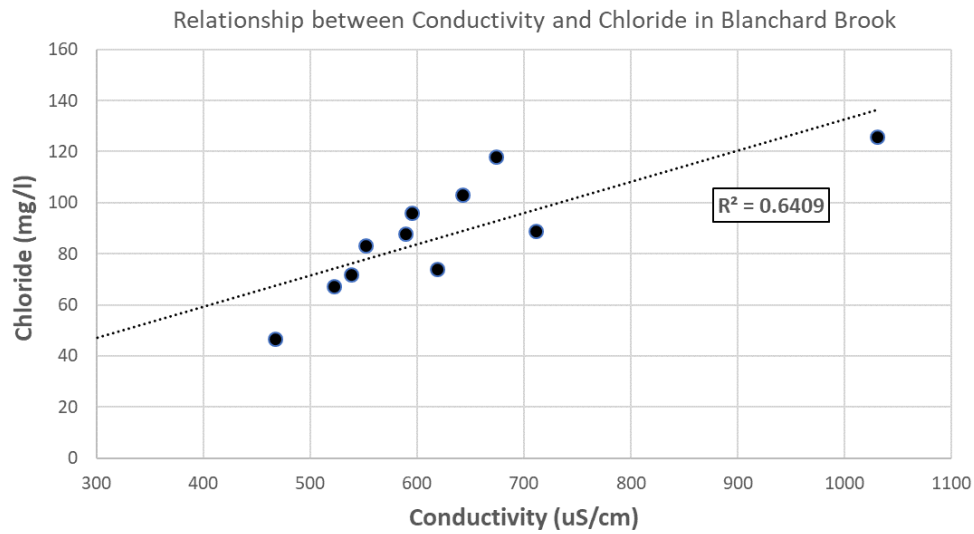


Figure 3: Relationship between conductivity and chloride values from sampling events in Table 2.

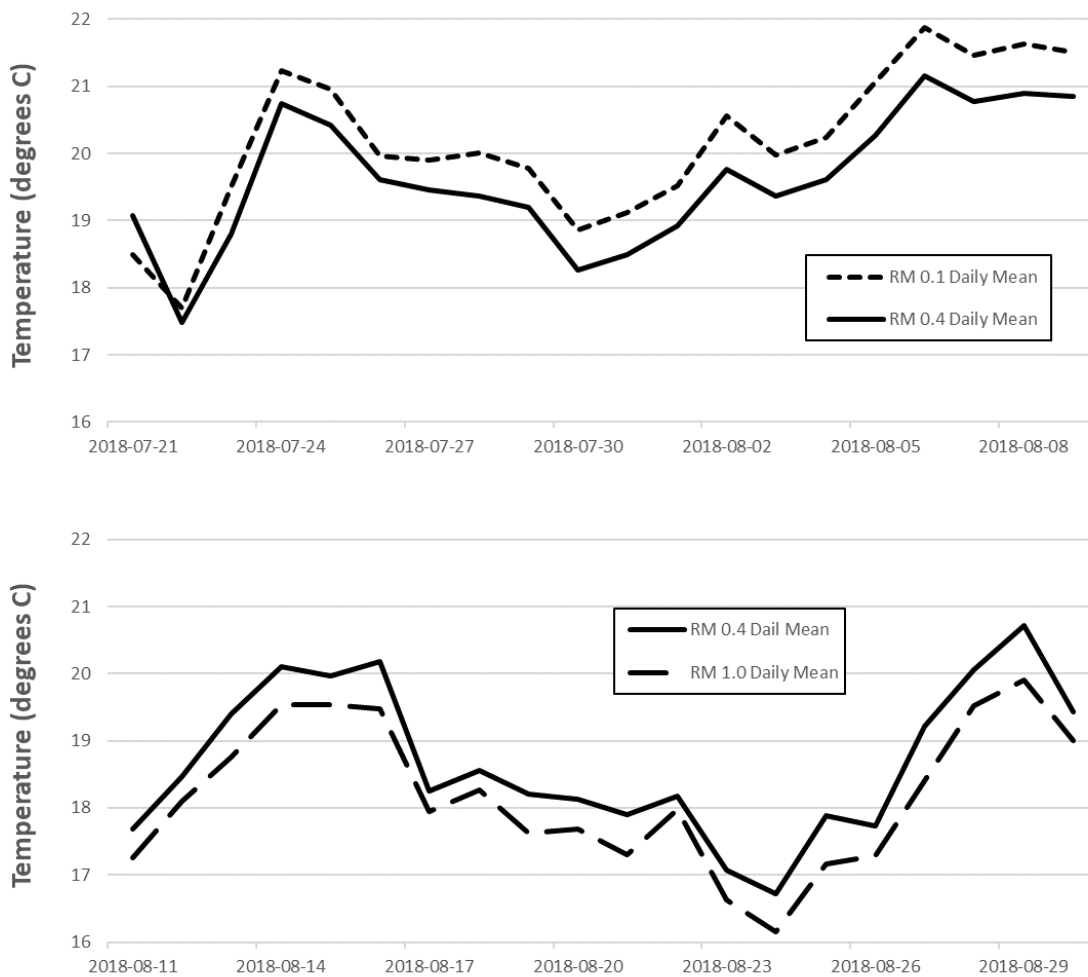
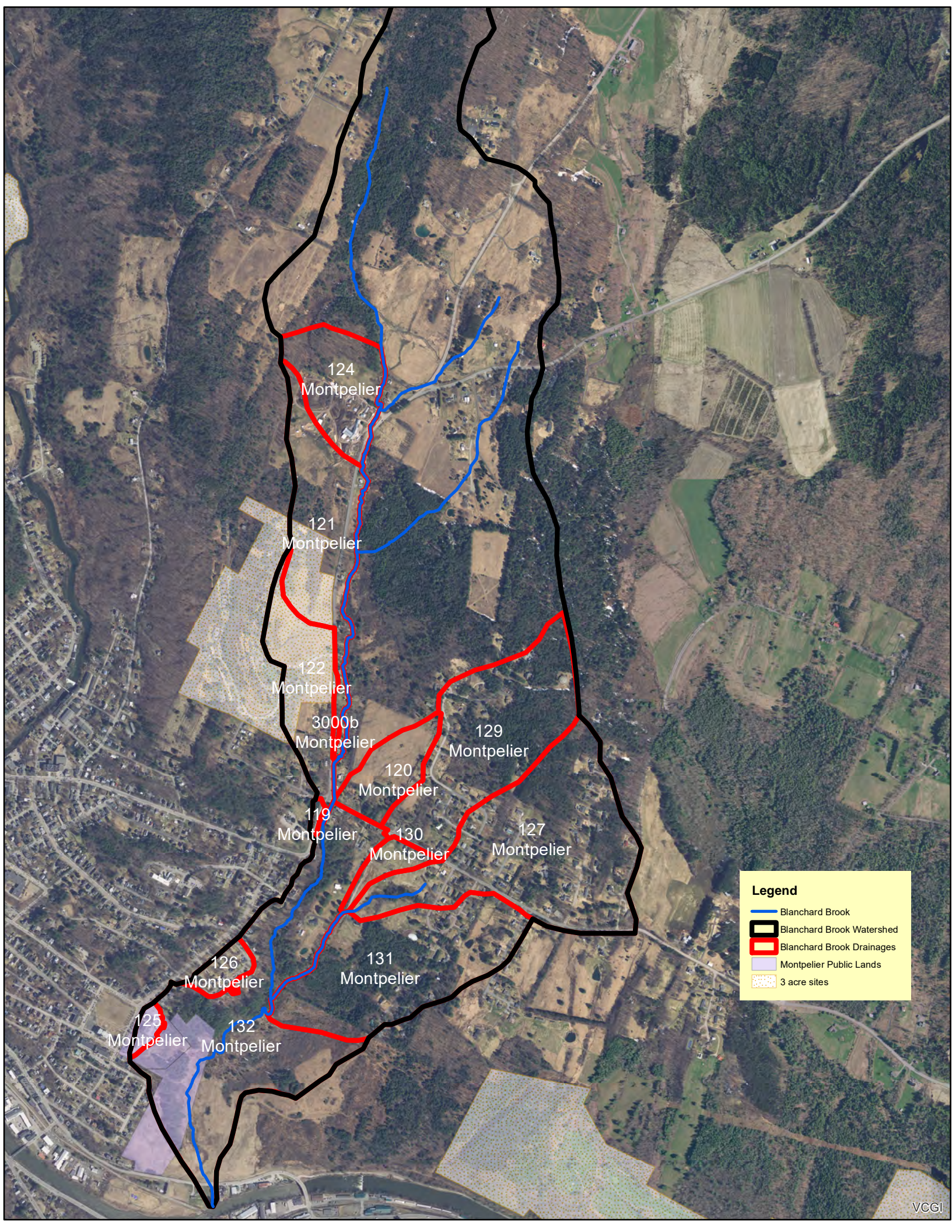


Figure 4: Daily mean temperature values for paired sites on Blanchard Brook.

Table 2: Water chemistry, periphyton, sediment, and biological assessment results (where available) for sites on Blanchard Brook.

| River Mile | Date | Flow Type | Conductivity (uS/cm) | Total Chloride (mg/l) | Total Nitrogen (mg/l) | Total Phosphorus (ug/l) | Turbidity (NTU) | Macro-algae MWA | Micro-algae MWA | % Fines/Gravel | Invertebrate Assessment | Fish Assessment | Brook Trout Density (#/100m2) |
|------------|-------------------|----------------|----------------------|-----------------------|-----------------------|-------------------------|-----------------|-----------------|-----------------|----------------|-------------------------|-----------------|-------------------------------|
| 0.1 | 2013-08-29 | Base | 642 | 103 | 0.53 | 8.52 | 0.55 | 0.1 | 0.4 | 40 | Good | Fair | 5.0 |
| 0.1 | 2014-10-02 | Base | 673 | 118 | 0.12 | 7.46 | 0.65 | 3.8 | 1.3 | 23 | Good/VG | Poor | 2.7 |
| 0.1 | 2015-09-21 | Base | 595 | 95.9 | 0.22 | 9.63 | 1.16 | 2.3 | 0.5 | 43 | Good | Fair | 6.0 |
| 0.1 | 2016-08-02 | Freshet | 542 | | 0.29 | 14.7 | | | | | | | |
| 1.7 | 2016-08-11 | Base | 1030 | 126 | 0.52 | 12.5 | 0.33 | | | | | | |
| 1.0 | 2016-08-11 | Base | 467 | 46.7 | 0.3 | 11.1 | 0.5 | | | | | | |
| 0.1 | 2016-08-11 | Base | 711 | 88.8 | 0.22 | 12 | 1.32 | | | | | | |
| 1.7 | 2016-08-12 | Freshet | 422 | | 0.42 | 18.3 | 1.4 | | | | | | |
| 1.0 | 2016-08-12 | Freshet | 474 | | 0.51 | 20.1 | 4.1 | | | | | | |
| 0.4 | 2016-08-25 | Base | 552 | 83.1 | 0.53 | 15.7 | 0.6 | 0 | 0.1 | 29 | Good | Good | 15.5 |
| 1.7 | 2018-08-10 | Base | 619 | 74.0 | 0.72 | 26.3 | 0 | | | | | | |
| 1.0 | 2018-08-10 | Base | 523 | 67.4 | 0.41 | 13.5 | 6.2 | | | | | | |
| 0.4 | 2018-08-10 | Base | 538 | 71.8 | 0.39 | 10.6 | 2 | | | | | | |
| 0.1 | 2018-08-10 | Base | 589 | 87.8 | 0.24 | 8.22 | 0.2 | | | | | | |



Legend

- Blanchard Brook
- ▭ Blanchard Brook Watershed
- ▭ Blanchard Brook Drainages
- ▭ Montpelier Public Lands
- ▭ 3 acre sites

124
Montpelier

121
Montpelier

122
Montpelier

3000b
Montpelier

129
Montpelier

120
Montpelier

119
Montpelier

130
Montpelier

127
Montpelier

126
Montpelier

131
Montpelier

125
Montpelier

132
Montpelier

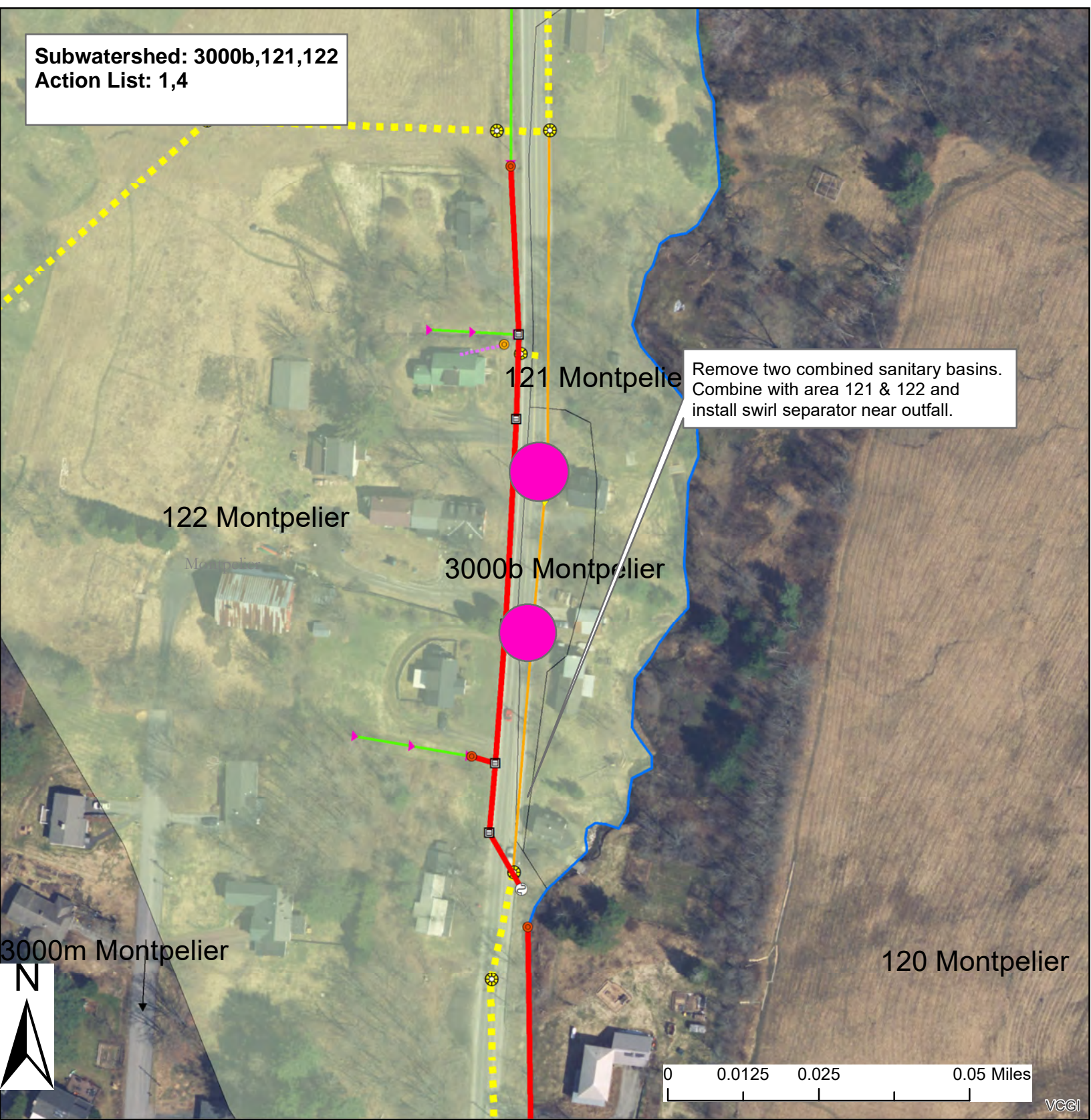
| Watershed Number | Action List # | Proposed Action | Proposed or Existing Stormwater Treatment Practice | Permit Number | Watershed Area (Acres) | Percent Mapped Impervious Area (MIA) | Sediment Load with Current Reductions (lbs.) | Priority Action Sediment Reduction Credit | Sediment Load with Priority Action (lbs.) | Phosphorus Load with Current Reductions (lbs.) | Priority Action Phosphorus Reduction Credit | Phosphorus Load with Priority Action (lbs.) | Estimated Basin Construction Cost | Estimated Other BMP Construction Cost | Cost of Sediment Removal Per Pound (based on annual sediment load) | Cost of Phosphorus Removal Per Pound (based on annual phosphorus load) | Assistance Program | # LID-Roof Raingardens to Treat Water Quality Volume | IF Landuse is residential AND receiving water is small: number of raingardens needed to treat CPv | Raingarden Cost for CPv |
|------------------|---------------|--|--|---------------|------------------------|--------------------------------------|--|---|---|--|---|---|-----------------------------------|---------------------------------------|--|--|--------------------|--|---|-------------------------|
| 119 Montpelier | | | CB | | 0.9 | 31.2 | 248 | 0% | 248 | 0.69 | 0% | 0.69 | | | | | ERP_SRF_LCBP | 7 | 0 | \$0 |
| 120 Montpelier | | | OF/GS | | 14.5 | 7.2 | 1296 | 0% | 1296 | 3.60 | 0% | 3.60 | | | | | ERP_SRF_LCBP | 37 | 57 | \$26,360 |
| 121 Montpelier | 4 | Combine with areas 3000b & 122 | VS/GS/OF | | 38.3 | 5.8 | 3178 | 80% | 636 | 8.83 | 10% | 7.95 | | | | | ERP_SRF_LCBP | 90 | 123 | \$56,361 |
| 122 Montpelier | 4 | Combine with areas 3000b & 121 | VS/GS/OF/CB | 3205-9010 | 25.1 | 12.3 | 1514 | 80% | 303 | 5.61 | 10% | 5.05 | | | | | ERP_SRF_LCBP | 71 | 170 | \$78,370 |
| 124 Montpelier | | | CB/SWPPP/SB | 6472-9003 | 23.6 | 5.7 | 1069 | 0% | 1069 | 3.96 | 0% | 3.96 | | | | | ERP_SRF_LCBP | 50 | 0 | \$0 |
| 125 Montpelier | | | CB | | 2.6 | 80.4 | 2534 | 0% | 2534 | 7.04 | 0% | 7.04 | | | | | ERP_SRF_LCBP | 72 | 0 | \$0 |
| 126 Montpelier | 1 | Upgrade WP with reverse slope pipe behind 8 McKinley St | MOD/WP/CB/OF | | 5.3 | 28.6 | 1058 | 60% | 423 | 3.31 | 30% | 2.31 | | \$20,000 | \$32 | \$14,719 | ERP_SRF_LCBP | 37 | 84 | \$38,461 |
| 127 Montpelier | 1 | Gravel wetland behind 75 Grandview Terrace | GW/OF/GS/CB | | 77.5 | 14.5 | 10247 | 80% | 2049 | 28.46 | 40% | 17.08 | \$190,669 | | \$23 | \$16,746 | ERP_SRF_LCBP | 290 | 619 | \$284,529 |
| 129 Montpelier | 1 | Gravel wetland behind 60 Chestnut Hill Rd | GW/OF/GS/CB | | 55.8 | 11.3 | 6234 | 60% | 2494 | 17.32 | 30% | 12.12 | \$115,997 | | \$17 | \$2,209 | ERP_SRF_LCBP | 176 | 347 | \$159,819 |
| 130 Montpelier | | | WP/GS | | 5.9 | 7.1 | 471 | 0% | 471 | 1.31 | 0% | 1.31 | | | | | ERP_SRF_LCBP | 13 | 23 | \$10,651 |
| 131 Montpelier | | | GS/WP/OF | | 57.9 | 7.2 | 4619 | 0% | 4619 | 12.83 | 0% | 12.83 | | | | | ERP_SRF_LCBP | 131 | 228 | \$104,841 |
| 132 Montpelier | | | GS/OF | | 87.2 | 3.2 | 6389 | 0% | 6389 | 17.75 | 0% | 17.75 | | | | | ERP_SRF_LCBP | 181 | 155 | \$71,514 |
| 3000b Montpelier | 1 | Remove combined sanitary catchbasins and combine with areas 121 & 122, install a swirl separator | VS/CB/OF | | 0.3 | 56.0 | 197 | 80% | 39 | 0.55 | 10% | 0.49 | | \$50,000 | \$4,071 | \$913,917 | ERP_SRF_LCBP | 6 | 11 | \$4,927 |

Target Maps

*Showing Priority Action List
Drainage Areas*

And Potential Retrofit Locations

Subwatershed: 3000b,121,122
Action List: 1,4

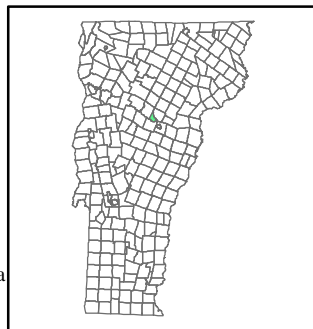


Montpelier, VT

DEC Stormwater Infrastructure Mapping Project

This map shows high priority subwatersheds which are ranked by connectedness, percent of impervious cover, field observations, and potential retrofit measures and locations.

The data shown on this map is only as accurate as the available sources and field observations allowed and should be used as a basic planning level tool only.



Stormwater points

- Pipe Cross (not connected)
- Catchbasin
- Dry Well
- Drop Inlet
- Grate/Curb Inlet
- Yard drain
- CB tied to sanitary sewer
- Junction Box
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Control Structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

Stormwater line

- Storm line
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

NRCS Soils

Creator: Jim Pease, David Ainley
 DEC - WID - Clean Water Initiative Program
 Plotted Date: 10/15/2021
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survey
 Imagery Source: VCGI Best Available Imagery

Subwatershed: 126
Action List: 1

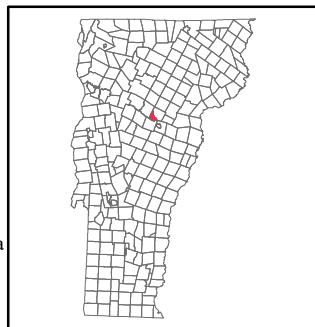


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- Dry Well
- Drop Inlet
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- CB tied to sanitary sewer
- Junction Box
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- Outfall
- Culvert inlet
- Culvert outlet
- Pond outlet structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
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Stormwater line

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- Stream
- Overland flow

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

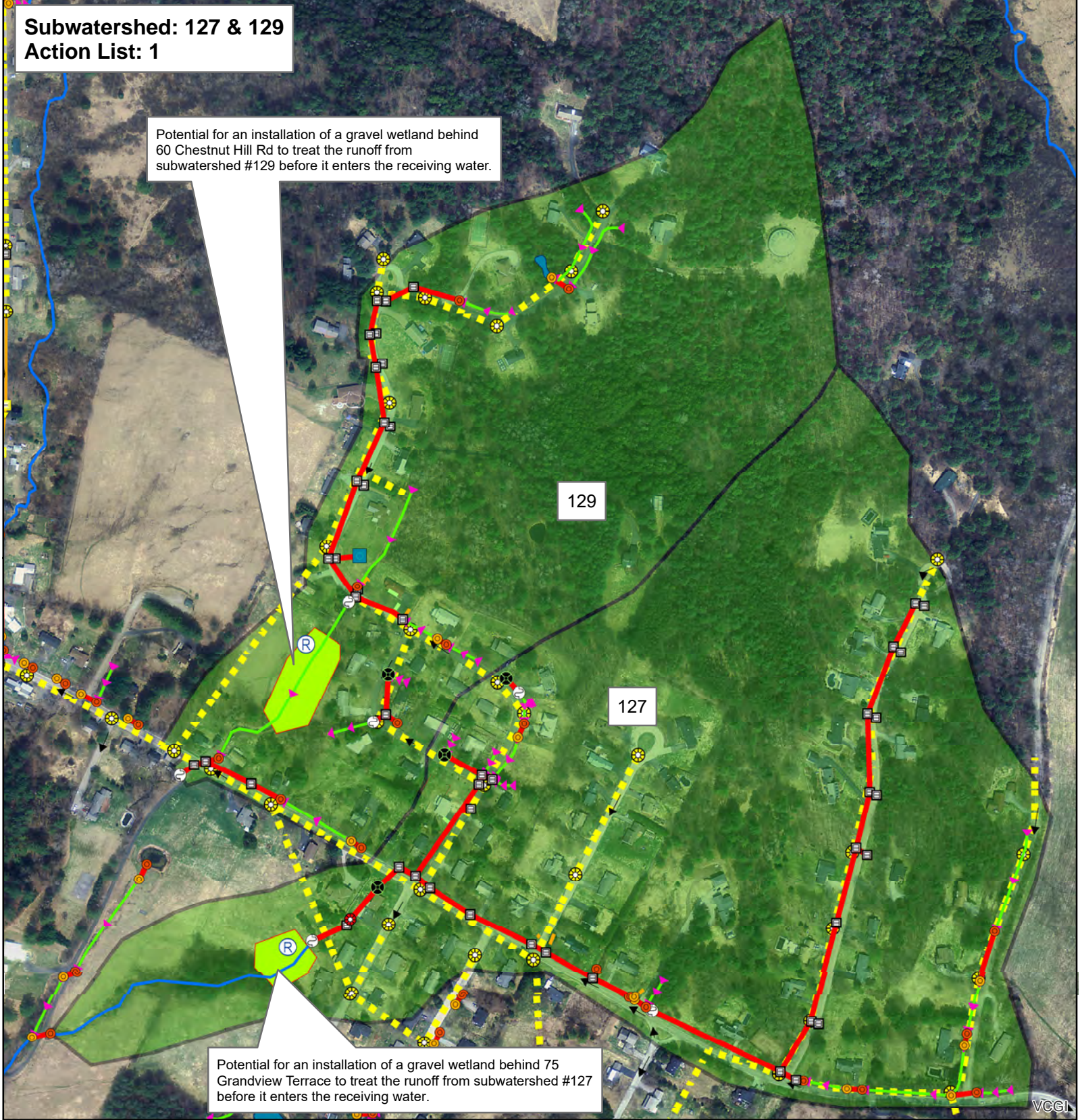
Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 7/23/2015
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survey
 Imagery Source: VCGI



Subwatershed: 127 & 129
Action List: 1

Potential for an installation of a gravel wetland behind 60 Chestnut Hill Rd to treat the runoff from subwatershed #129 before it enters the receiving water.

Potential for an installation of a gravel wetland behind 75 Grandview Terrace to treat the runoff from subwatershed #127 before it enters the receiving water.

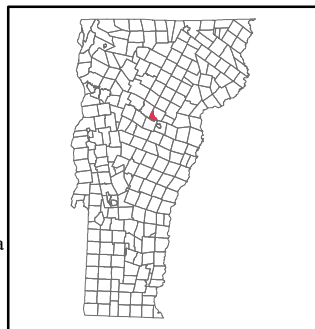


Montpelier, VT

DEC Stormwater Infrastructure Mapping Project

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Stormwater points

- Pipe Cross (not connected)
- Catchbasin
- Dry Well
- Drop Inlet
- Grate/Curb Inlet
- Yard drain
- CB tied to sanitary sewer
- Junction Box
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Pond outlet structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

Stormwater line

- Storm line
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

NRCS - Soils

- A
- B
- C
- D


SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 7/23/2015
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survey
 Imagery Source: VCGI



Problem Area Data Sheet

| | | |
|--|--|------------------------------|
| Problem Area ID: BB-01 | Latitude: 44.256666 | Longitude: -72.563895 |
| Watershed: Blanchard Brook (VT DEC Subwatersheds 109/126) |  | |
| Location: Arsenal Drive | | |
| Problem Type: Erosion, unmanaged impervious | | |
| Identification Source: SWMP Assessment | | |
| Ownership: City/Private | | |
| Classification: 3 | | |

Date of Field Data Collection: September 17, 2015

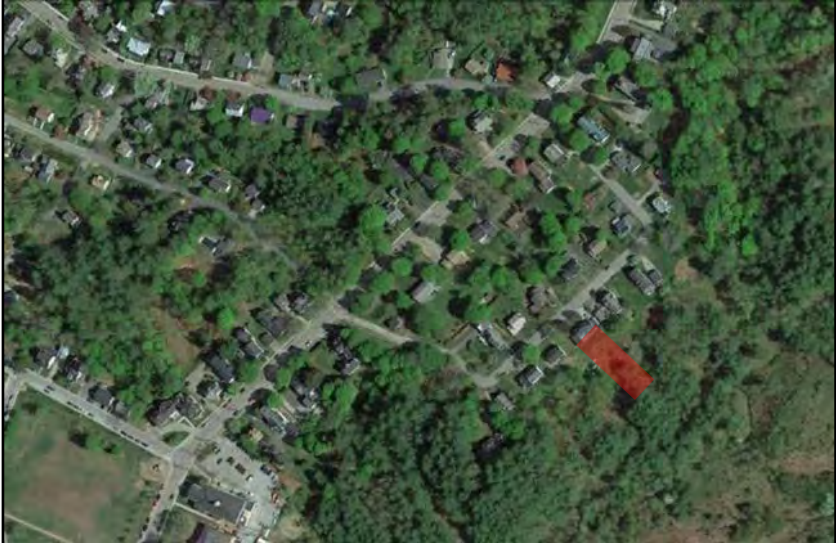
Description of Observed Conditions:
 Stormwater runoff from approximately 150' immediately east of College St. is turned out over a steep hillside and through an area where lawn waste is being composted. "Green Street" retrofitting could be used to better manage road runoff.

Field Photos



| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 2 | 2 | 2 | 1 | N | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-02 | Latitude: 44.256503 | Longitude: -72.561980 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 126) |  | |
| Location: 8 McKinley St | | |
| Problem Type: Erosion | | |
| Identification Source: SWMP Assessments | | |
| Ownership: Private | | |
| Classification: 5 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 City constructed a small splash pad/energy dissipation area approximately ¼ of the way down the slope in the backyard of #8 McKinley St as part of a CSO separation project. Homeowner indicated a willingness to consider improvements to the pond. Some erosion was visible below this structure.


Field Photos



Photo 1. Pool about ¼ of the way down the slope in the back yard. Photo 2. View down the slope from the pond.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 3 | 2 | 2 | 2 | N | Y | Y | Y |

Problem Area Data Sheet

| | | |
|--|--|------------------------------|
| Problem Area ID: BB-03 | Latitude: 44.257311 | Longitude: -72.561528 |
| Watershed: Blanchard Brook (VT DEC Subwatersheds 109/126) |  | |
| Location: Hinkley Street | | |
| Problem Type: Unmanaged impervious | | |
| Identification Source: SWMP Assessment | | |
| Ownership: Public | | |
| Classification: 6 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 Hinkley Street is wide, with no curbs separating the road edge from the adjoining green space. "Green Street" retrofit could be used to capture/treat runoff and add the benefit of traffic calming.


Field Photos



Photo 1.

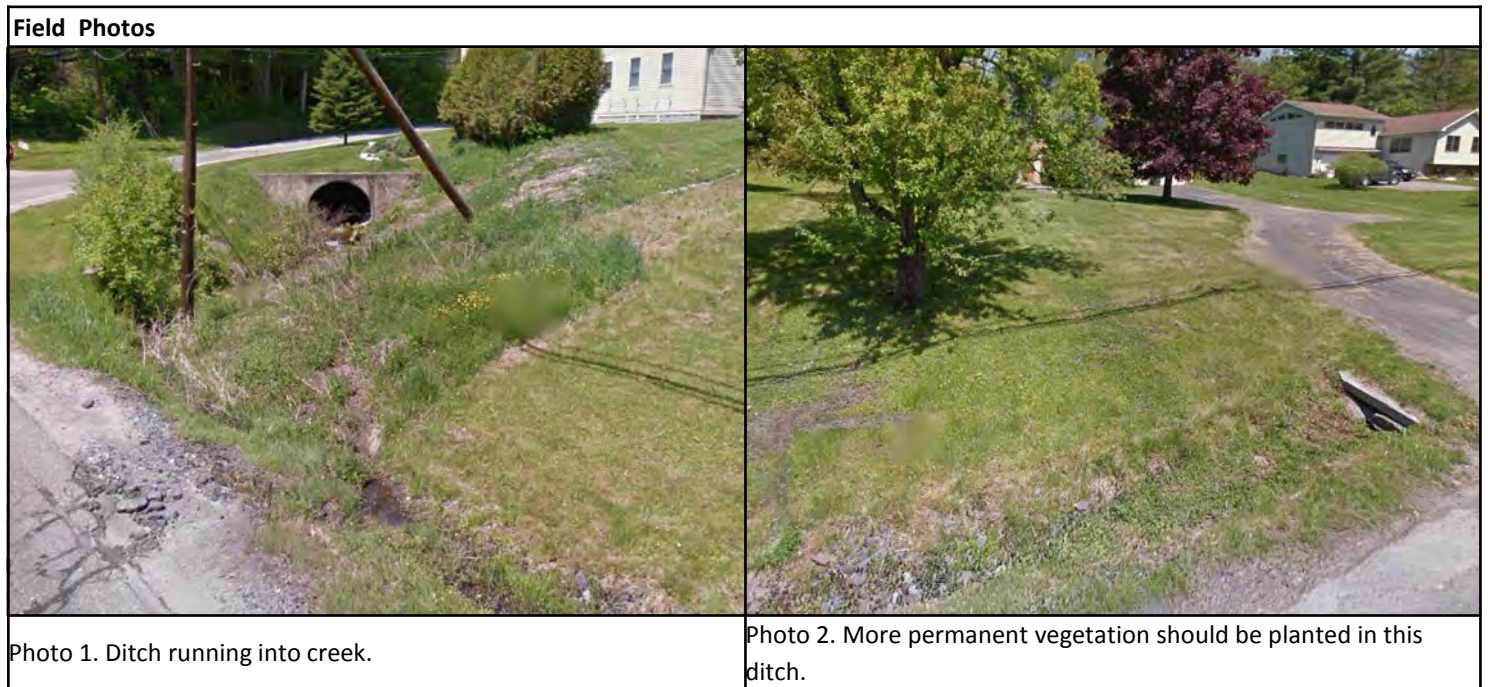
| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 2 | 2 | 1 | 2 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-04 | Latitude: 44.262094 | Longitude: -72.558453 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 120) |  | |
| Location: Towne Hill Rd/Main St | | |
| Problem Type: Erosion, unmanaged impervious | | |
| Identification Source: SWMP Assessment | | |
| Ownership: Public | | |
| Classification: 4 | | |


Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 Roadside drainage at the intersection of Towne Hill Rd and Main St is eroding. Drainage could be reshaped and stabilized to both reduce erosion and improve treatment.



| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 2 | 3 | 2 | 2 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-05 | Latitude: 44.261693 | Longitude: -72.557134 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 120) |  | |
| Location: Easy Street | | |
| Problem Type: Erosion, unmanaged impervious | | |
| Identification Source: SWMP Assessment | | |
| Ownership: Private | | |
| Classification: 4 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 Significant erosion of both the road surface and in the adjacent ditch was observed (Photo 1). A storm water treatment practice at the corner of Easy St and Towne Hill Rd could be effective in slowing and treating flow. The ditch itself should also be appropriately shaped and stabilized, and the road should be crowned.


Field Photos



Photo 1. Easy Street and roadside ditch to the right. Photo 2. Ditch in need of repair.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 2 | 2 | 3 | 2 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-07 | Latitude: 44.258303 | Longitude: -72.554199 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 131) |  | |
| Location: Grandview Terrace, SW end | | |
| Problem Type: Unmanaged impervious, erosion | | |
| Identification Source: SWMP Assessment/VTrans | | |
| Ownership: City/Private | | |
| Classification: 5 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 Grandview Terrace was resurfaced during the summer of 2015. Concentrated flow along the edge of the shoulder has already started to erode the gravel and it is accumulating around the catch basins at the bottom of Grandview Terrace. The paved turnout was installed too high, making it ineffective for directing storm water. The shoulder at ~140 Grandview Terrace is in poor shape as well, and requires maintenance.

Field Photos



Photo 1. Erosion at catch basin Photo 2. Ineffective turnout structure.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 3 | 2 | 3 | 3 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-08 | Latitude: 44.257749 | Longitude: -72.553852 |
| Watershed: <u>Blanchard Brook (VT DEC Subwatershed 131)</u> Location: <u>Spring Hollow Road</u> Problem Type: <u>Erosion, drainage</u> Identification Source: <u>SWMP Assessments</u> Ownership: <u>Private</u> Classification: <u>4</u> |  | |

Date of Field Data Collection: September 17, 2015


Description of Observed Conditions:
 Drainage at 28 Spring Hollow Road has recently been maintained, but was not stabilized. The V-shape and oversteepened banks of the drainage ditch will also need to be addressed.

Field Photos



| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 2 | 2 | 3 | 2 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-09 | Latitude: 44.259568 | Longitude: -72.551785 |
| Watershed: <u>Blanchard Brook (VT DEC Subwatershed 127)</u> Location: <u>Woodcrest Road</u> Problem Type: <u>Unmanaged impervious</u> Identification Source: <u>SWMP Assessments</u> Ownership: <u>City</u> Classification: <u>2</u> |  | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 “Green Street” or other retrofit within the ROW on Woodcrest Rd could be used to capture/treat runoff and add the benefit of traffic calming (Photo 1). On the opposite side of Woodcrest Rd a riser could be added to the catch basin to more effectively manage storm flows (Photo 2).

Field Photos



Photo 1. Potential rain garden site at the corner of Woodcrest and Towne Hill Rds.

Photo 2. Catch basin that needs to be fitted with a riser.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 1 | 2 | 2 | 1 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-10 | Latitude: 44.259040 | Longitude: -72.550512 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 127) |  | |
| Location: 438 Towne Hill Road | | |
| Problem Type: Erosion | | |
| Identification Source: SWMP | | |
| Ownership: City/Private | | |
| Classification: 4 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 The narrow ditch on the east side of the road needs to be reshaped and stabilized. Catch basin immediately to the west also shows signs of erosion.


Field Photos



Photo 1. Narrow ditch that needs to be expanded. Photo 2. Erosion around catch basin.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 1 | 2 | 2 | 1 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-11 | Latitude: 44.260909 | Longitude: -72.552409 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 127) |  | |
| Location: Dover Rd. at Phillips Rd. | | |
| Problem Type: Erosion, unmanaged impervious | | |
| Identification Source: SWMP Assessment | | |
| Ownership: City/Private | | |
| Classification: 3 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 The catch basin at the corner of Dover and Phillips could be raised. Stormwater storage/treatment could be provided in the green space as well (Photo 1). The ditch on the property across Dover Rd. could be reshaped and stabilized to reduce erosion (Photo 2).

Field Photos



Photo 1. Catch basin and potential treatment area. Photo 2. Narrow ditch that could be reshaped.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 1 | 2 | 2 | 1 | Y | Y | N | N |

Problem Area Data Sheet

| | | |
|---|--|------------------------------|
| Problem Area ID: BB-12 | Latitude: 44.262527 | Longitude: -72.553891 |
| Watershed: Blanchard Brook (VT DEC Subwatershed 127) |  | |
| Location: Chestnut Hill Road | | |
| Problem Type: Erosion | | |
| Identification Source: VTDEC Montpelier Stormwater Infrastructure Mapping Project | | |
| Ownership: Private | | |
| Classification: 3 | | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 The old concrete culvert to the east of 60 Chestnut Hill Road appears to be undersized and should eventually be replaced. For now, a splash pad beneath the outfall would help reduce localized erosion.


Field Photos



Photo 1. A splash pad at the outfall could reduce localized erosion.

| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 1 | 2 | 2 | 1 | N | Y | Y | N |

Problem Area Data Sheet

| | | |
|--|--|------------------------------|
| Problem Area ID: BB-13 | Latitude: 44.262167 | Longitude: -72.553011 |
| Watershed: <u>Blanchard Brook (VT DEC Subwatersheds 127/129)</u> Location: <u>Chestnut Hill Road</u> Problem Type: <u>Unmanaged impervious</u> Identification Source: <u>SWMP Assessments</u> Ownership: <u>City</u> Classification: <u>6</u> |  | |

Date of Field Data Collection: September 17, 2015

Description of Observed Conditions:
 Stream channel is currently unraveling below the road; this channel was partially stabilized following a 2008 storm event. Removing the curb on the east side of the street below 135 Phillips Road would allow for a grassed swale to manage stormwater runoff.

Field Photos



| Prioritization Ranking Factors | | | | | | | |
|--------------------------------|-----------|-------------------|---------|----------------------------------|-------------------|---------------------------------|---------------------------------------|
| Relative Impact | Frequency | Current Condition | Urgency | Impact to public infrastructure? | Realistic to fix? | Impacts beyond water resources? | Part of a larger or systemic problem? |
| 1 | 2 | 2 | 1 | Y | Y | N | N |