



Stakeholder Meeting #1

Moon Brook Impoundment Modification Project



City of Rutland | October 24, 2016

Agenda

7:00 – 7:20 Introduction and Project Overview (Roy)

7:20 – 7:30 Background (Jeff)

7:30 – 7:45 Watershed, Water Quality, & Projects (Ethan)

7:45 – 8:00 Project Requirements (Roy)

8:00 – 8:30 Stakeholder Values Exercise (Roy and Jessica)

8:30 – 9:00 Open Comments

Project Overview

- 5 public meetings.
- Individual meetings upon request.
- Data collection and review
- Alternatives analysis
 - Work together to identify the best collective solution to meet project requirements and encompasses stakeholder values.
- Preliminary Design
- Permitting

Public Meetings

- Meeting #1. Introductions, values, and initial information exchange.
- Meeting #2. Alternatives analysis feedback. Select a preferred alternative to develop visualizations and concept designs.
- Meeting #3. Present photo-simulations and concept designs. Seek consensus on a preferred alternative to advance design.
- Meeting #4. Preliminary design review.
- Meeting #5. Post-permitting design review.

Schedule

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Task A – Public Outreach													
1.1	Project Kickoff Meeting	█											
1.2	Five (5) Public Outreach Meetings*												
1.3	Individual Outreach Meetings												
1.4	City Board of Aldermen Meeting												
1.5	Photo-simulations and Concept Sketch Designs												
1.5.1	Select Flows for Photo-Simulations												
1.5.2	Hydraulic Modeling for Visualizations												
1.5.3	Draft Photo-Simulations												
1.5.4	Draft Concept Sketch Designs												
1.5.5	Revise Photo-Simulations and Concept Designs												
Task B – Data Collection and Review													
2.1	Data Collection & Review	█	█										
2.2	Field Reconnaissance												
2.3	Data Gaps												
Task C – Alternatives Analysis													
3.1	Alternatives Analysis												
3.2	Permitting Assessment												
3.3	Evaluate Cost												
3.4	Recommended Alternative												
Task D – Selection of Preferred Alternative													
4.1	Reporting												
4.2	Prepare Presentation												
4.3	Confirm Preferred Alternative												
4.4	Project Development												
Task E – Preliminary Design and Permitting													
5.1	Base Mapping												
5.2	Preliminary Design Plans												
5.3	Revise Preliminary Design Plans												
5.4	Regulatory Feedback and Edits												
5.5	Permit Submission												
5.6	Respond to Comments												
5.7	Revise Plans												

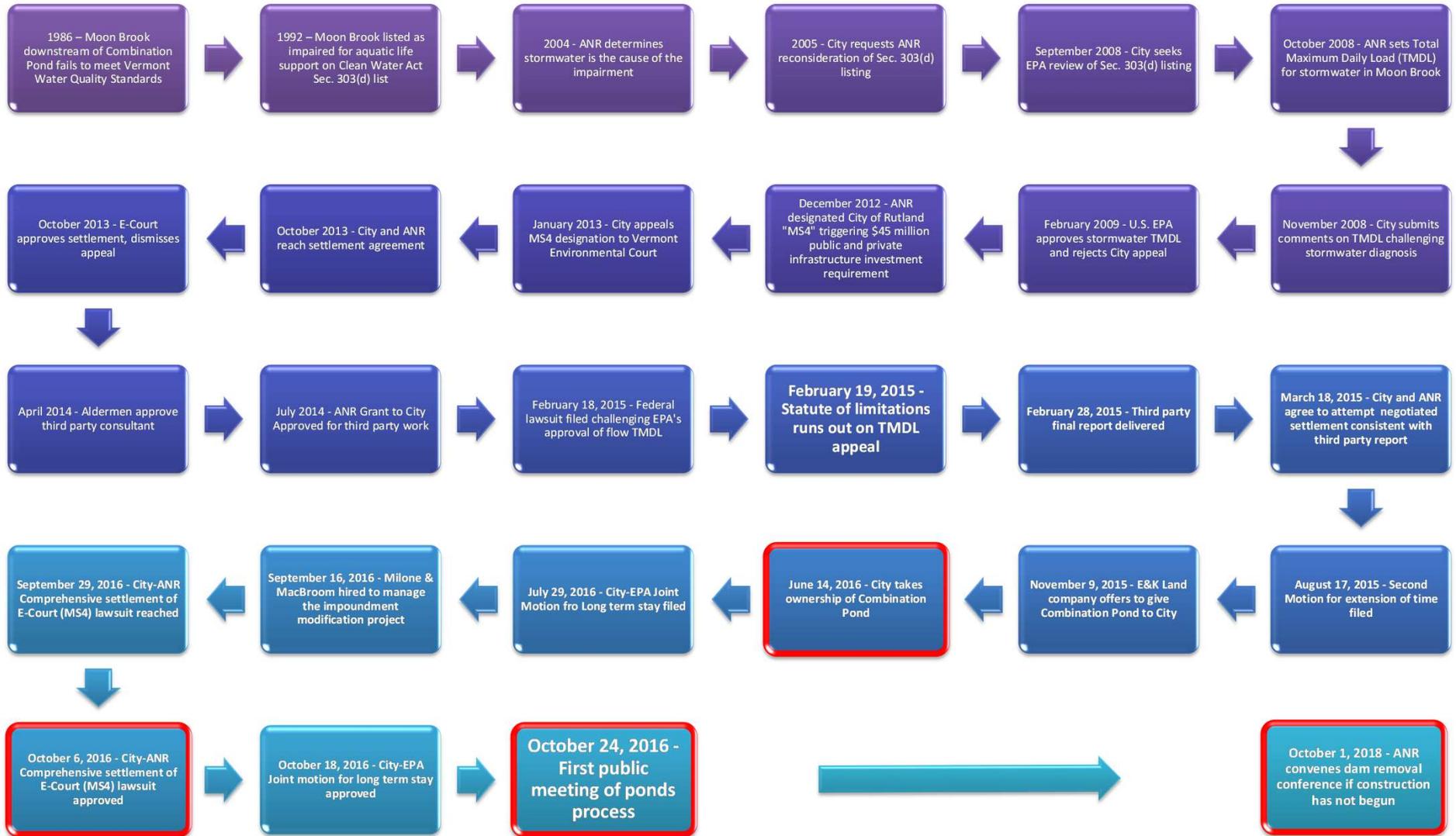
*Outreach meeting times to be scheduled as project progresses.

Staying Involved

1. Attend public meetings.
2. Share information.
3. Request individual meetings.
4. Help reach consensus.
5. Follow information on website.

www.rutlandcity.org/ponds

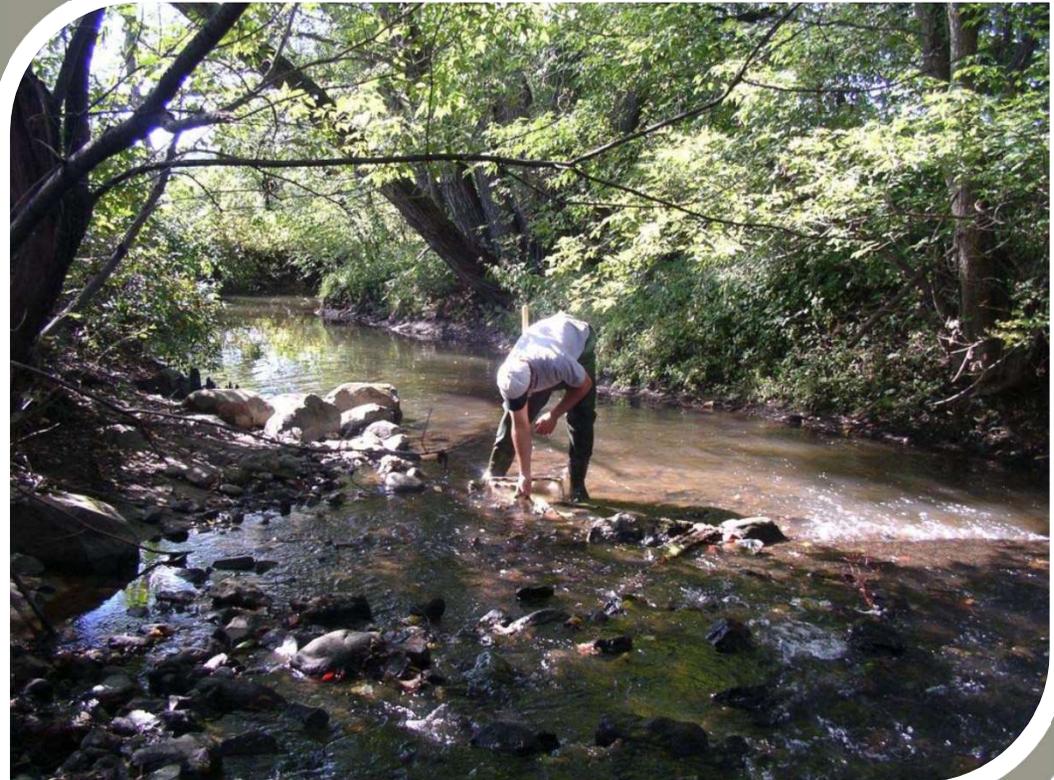
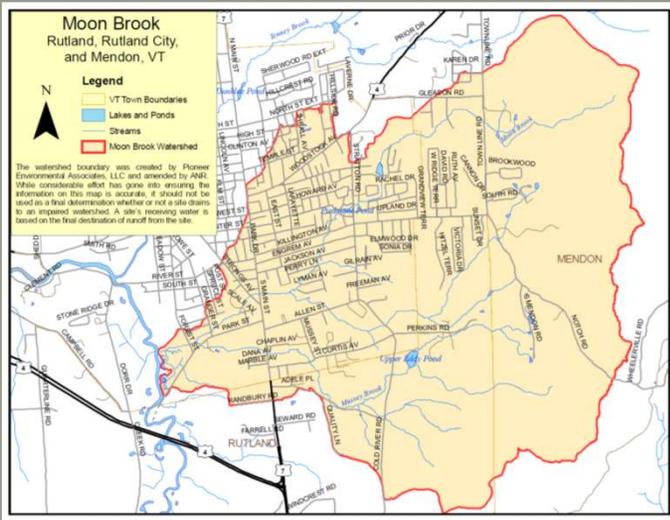
Moon Brook Timeline



Moon Brook Watershed

Watershed, Water Quality, & Projects

Ethan Swift
Vermont Watershed Management Division
Agency of Natural Resources, Department of Environmental Conservation



Moon Brook Watershed



- 1,800 acres within the City of Rutland
- 40% of the City of Rutland
- Includes Mussey and Paint Mine Brooks
- Impaired reach (red) is Moon Brook only, Combination Pond outfall to Otter Creek

Vermont Water Quality Standards

- The Fed. Clean Water Act requires States to set minimum quality requirements.
- Water Quality Standards consist of:
 - Uses
 - Aquatic life, swimming, boating, drinking, fish consumption
 - Water Quality Classes
 - Groupings of waters with the same goals
 - Water Quality Criteria
 - Numeric “not to exceed” values

Vermont Water Quality Standards

- When Criteria are not met, surface water is identified as “impaired.”
- CWA and VT Law requires that impairments be cleaned up using a pollution load allocation process known as a TMDL.
- The TMDL sets the maximum allowable levels of pollutants that may enter a surface water while maintaining that waterbody in compliance with criteria.

Biological Indicators

- VT has a scientifically based, nationally recognized biological criteria program.
- Measures Aquatic Life Use directly using both aquatic insects and non-game fish.

• Sensitive-rare taxa



Pteronarcys



Slimy Sculpin

• Sensitive-ubiquitous



Stenonema



Brook Trout

• Taxa of intermediate tolerance



Neureclipsis



Common Shiner

• Tolerant taxa



Chironomus



Blacknose Dace

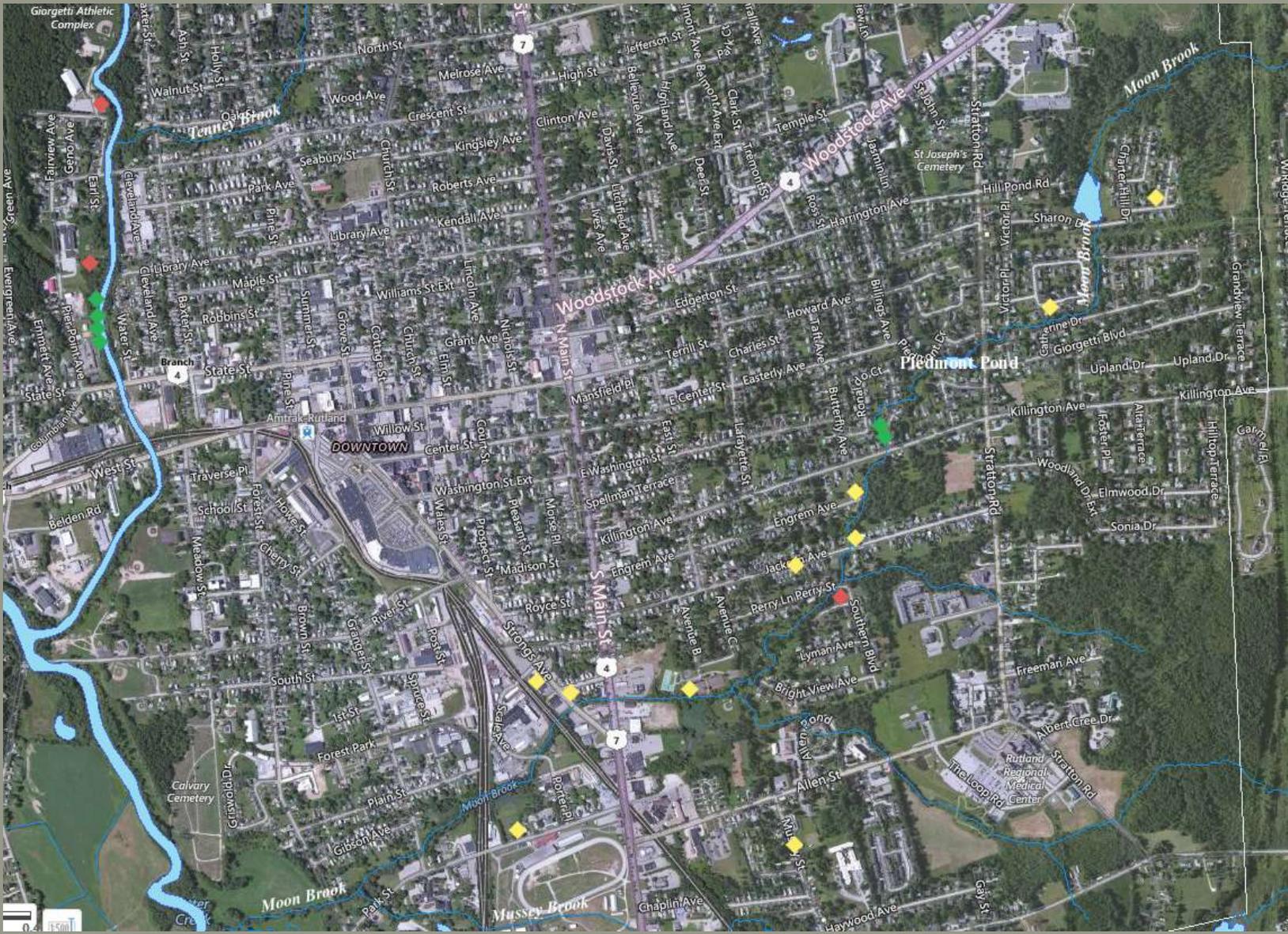
Monitoring and Assessment

- Biomonitoring (since 1987) – fish and benthic macroinvertebrates (bugs)
- Physical Assessment Moon Brook Stream Geomorphic Assessment and Corridor Plan (March, 2008) – Bear Creek Environmental through the Rutland NRCD (funded by VTDEC)
- Chemical Water Quality Monitoring (VTDEC and the Rutland NRCD via LaRosa Program for Analytical Services (since 2003) - Parameters include phosphorus, *E. coli*, turbidity, total suspended solids, and nitrogen
- Thermal monitoring of ponds and brook (including adjacent streams – Tenney Brook, East Creek ,etc) – by City and VTDEC

Projects

- Several Education and Outreach Efforts
- Rutland City Rooftop Disconnect and Rain Barrel/ Rain Garden Project (including City Parks)
 - 13 properties were disconnected and downspouts were directed to either a rain barrel or a rain garden.
- Rutland NRCD Trees for Streams
- Southern Boulevard sand filter
- Other bio-infiltration/ detention projects (Rutland NW Elementary School)
- Georgetti Park SW BMP

Project locations



Rutland City rain gardens



Rutland City buffer plantings

East Creek Bike Path



Moon Brook

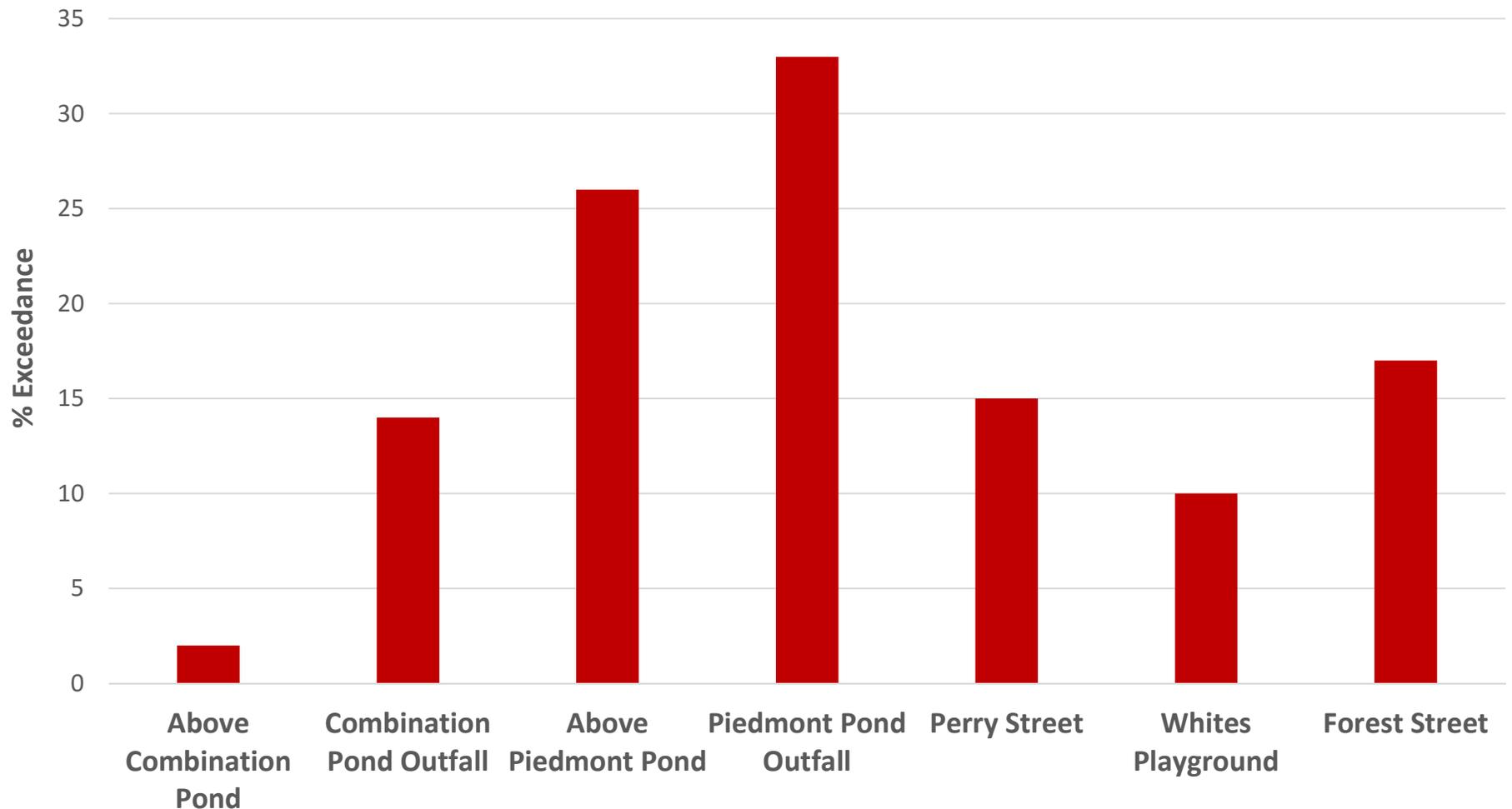


Key Project Requirements

1. Improve Moon Brook water quality.
2. Improve dam safety.
3. Obtain non-impervious surface treatment offset.
4. Start construction by October 1, 2018.
5. Create an insurable setting.
6. Reduce financial exposure.

Water Temperature Monitoring Data

Percent of Time Water Temperature Meets or Exceeds the Avoidance Temperature for Brook Trout (70° F)

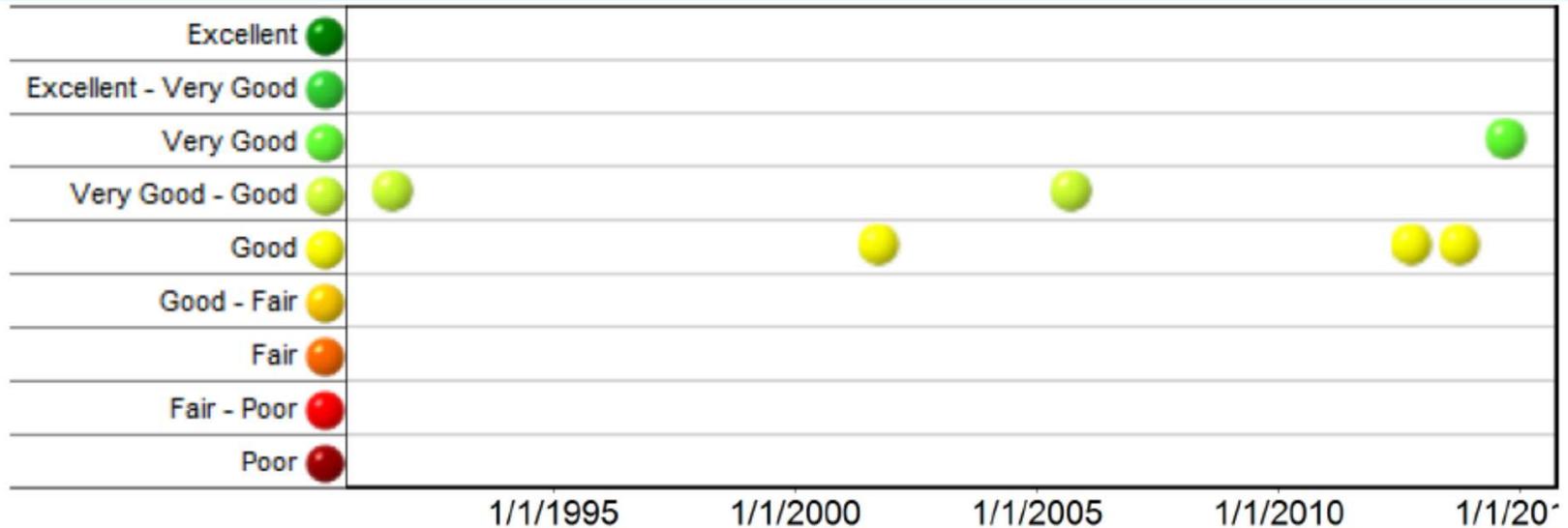
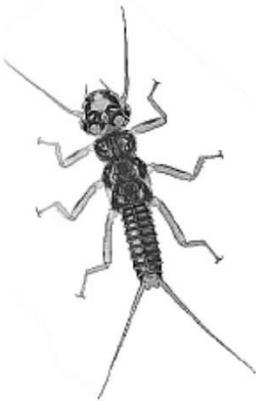


(Kleinschmidt, 2015)

Biomonitoring Data – Upstream of Ponds

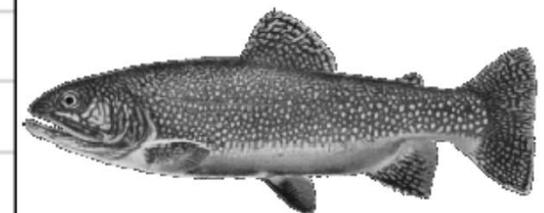
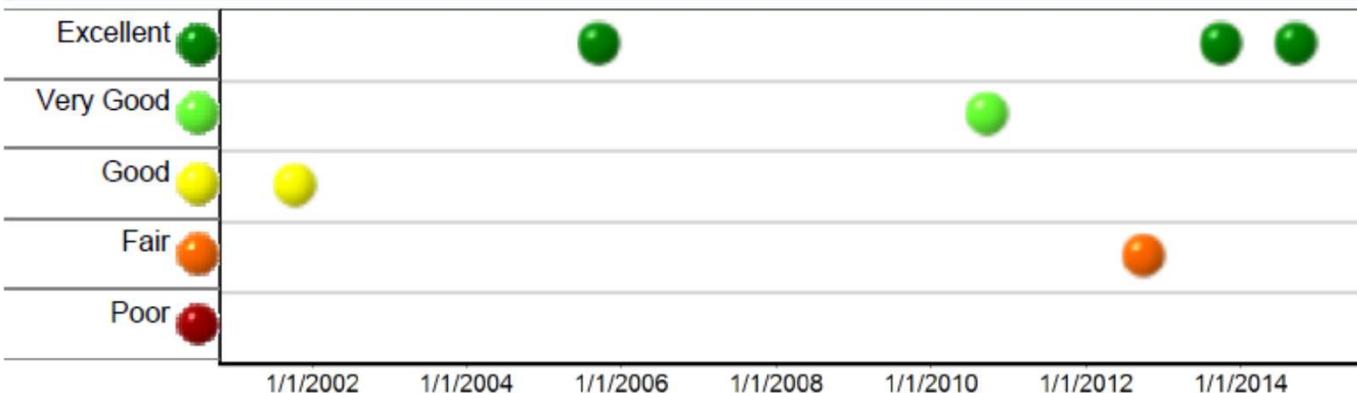
Macroinvertebrate Assessment

Macroinvertebrate population Assessments are a measure of the biological integrity of the macroinvertebrate community and an indicator of the health of the aquatic biota. (For More Details)



Fish Assessment

Fish populations provide a measurement of the general health of the aquatic biota. Since fish occupy the top of the food web their population integrates the conditions of lower community types. (For More Details)

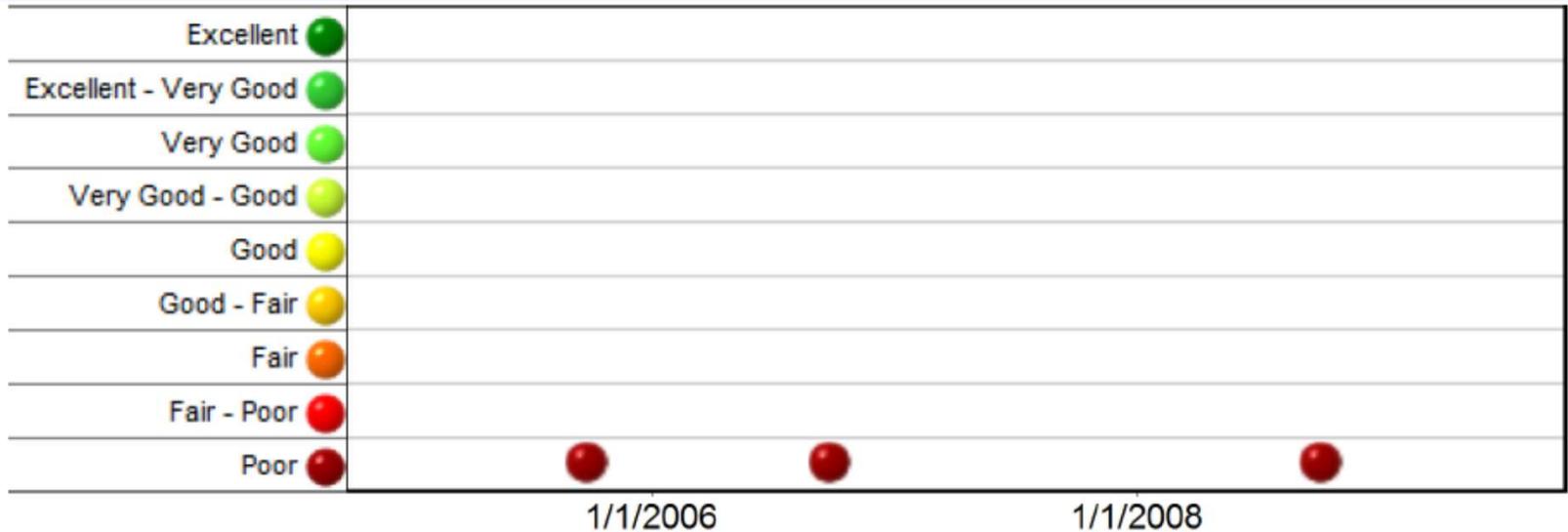


(VTANR, Accessed 2016)

Biomonitoring Data – Between Ponds

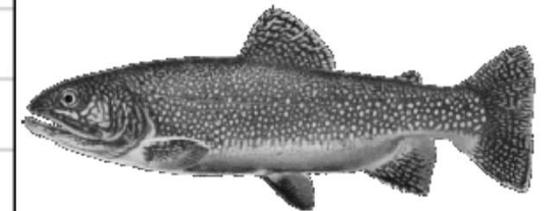
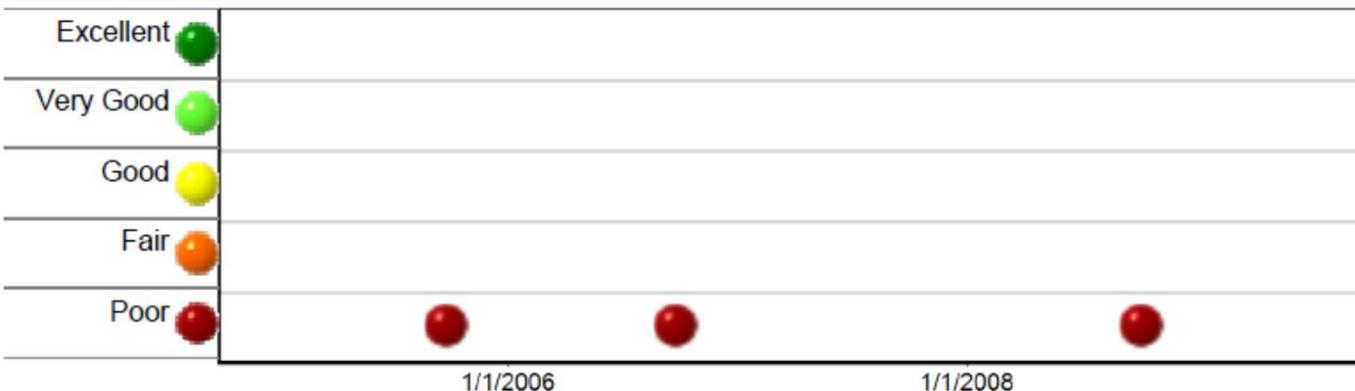
Macroinvertebrate Assessment

Macroinvertebrate population Assessments are a measure of the biological integrity of the macroinvertebrate community and an indicator of the health of the aquatic biota. (For More Details)



Fish Assessment

Fish populations provide a measurement of the general health of the aquatic biota. Since fish occupy the top of the food web their population integrates the conditions of lower community types. (For More Details)



(VTANR, Accessed 2016)

Dam Safety

1. Both dams in poor condition.
2. Both dams rated as low hazard. Combination Pond Dam rating subject to change.
3. Combination Pond: Sink holes on right abutment, seepage, and trees on embankment. Limited flow capacity.
4. Piedmont Pond: Concrete deteriorated and undercut. Stop logs decayed.

Non-Impervius Stormwater Offset Permit

1. Stormwater impaired waters restoration fund grant requirement.
2. Possible offset projects.
 - a. Stormwater treatment at Charter Hills.
 - b. Channel or floodplain modification.
 - c. Buffer plantings.

Settlement Agreement Between ANR and City

October 1, 2018

Insurance

1. This is the one City-owned dam that is not insurable.
2. Not enough flood storage. Downstream flood risk is public liability.
3. Seek solution that is insurable.

Money

1. Cost to retrofit sites to reduce thermal impacts is financial burden to the City and taxpayers.
2. Seeking largest benefit for lowest cost.

Values Exercise

What do you
value about the
impoundments?

Email to Schedule Follow-up Discussions

Roy Schiff

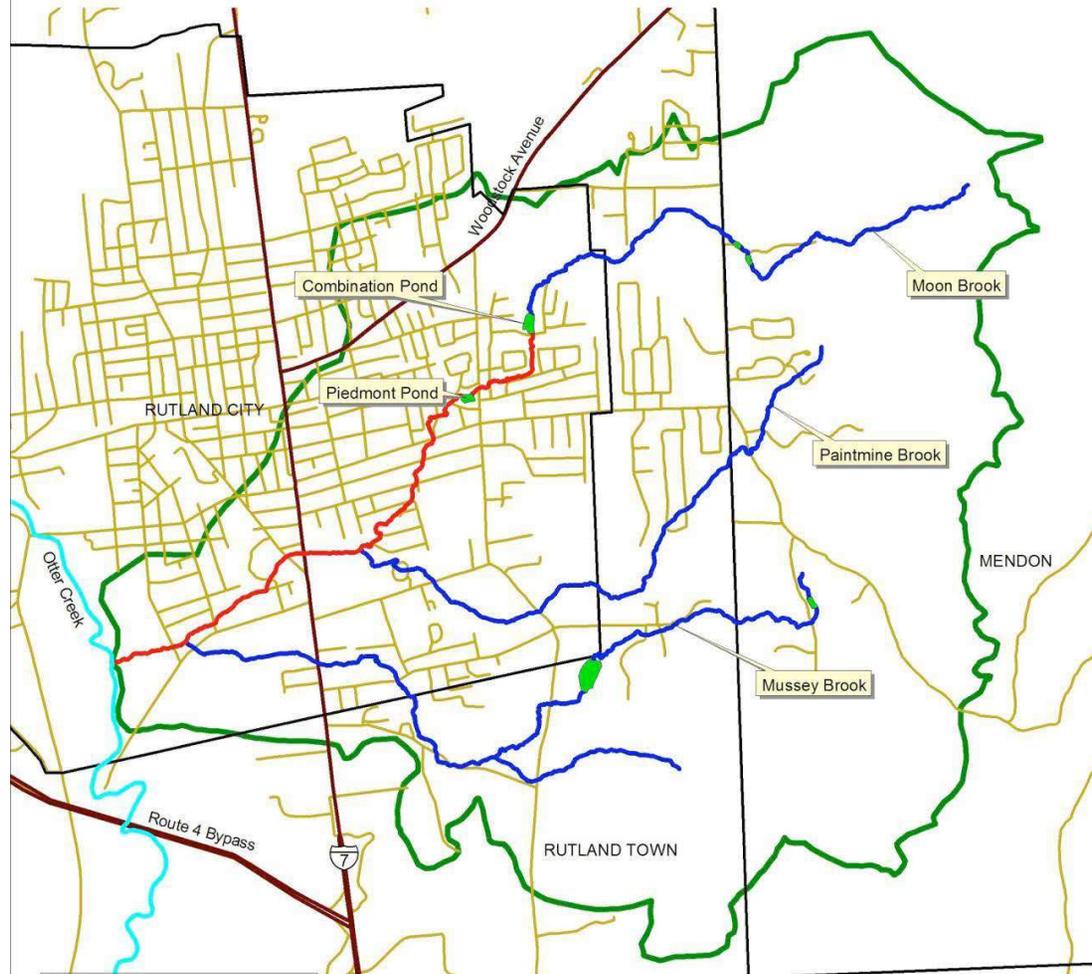
rschiff@mminc.com

Jessica Louisos

jlouisos@mminc.com

Extra Slides

Moon Brook Watershed 2008 State of Vermont 303 (d) Impaired Waters



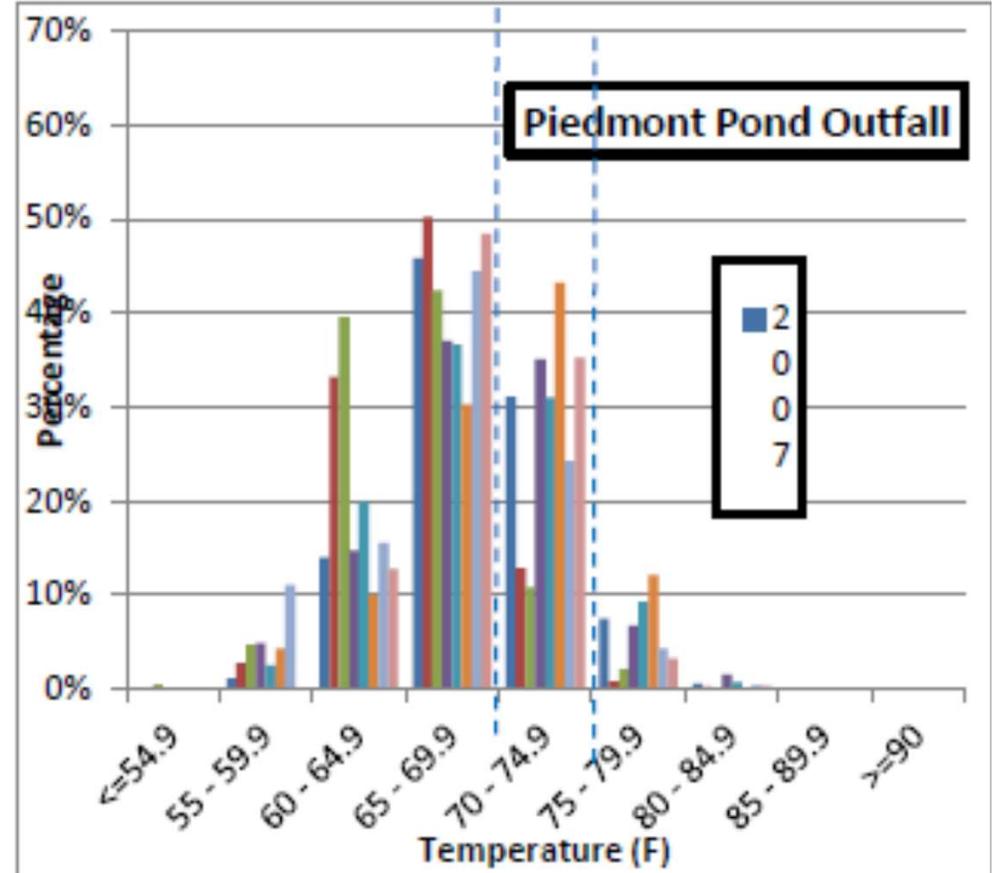
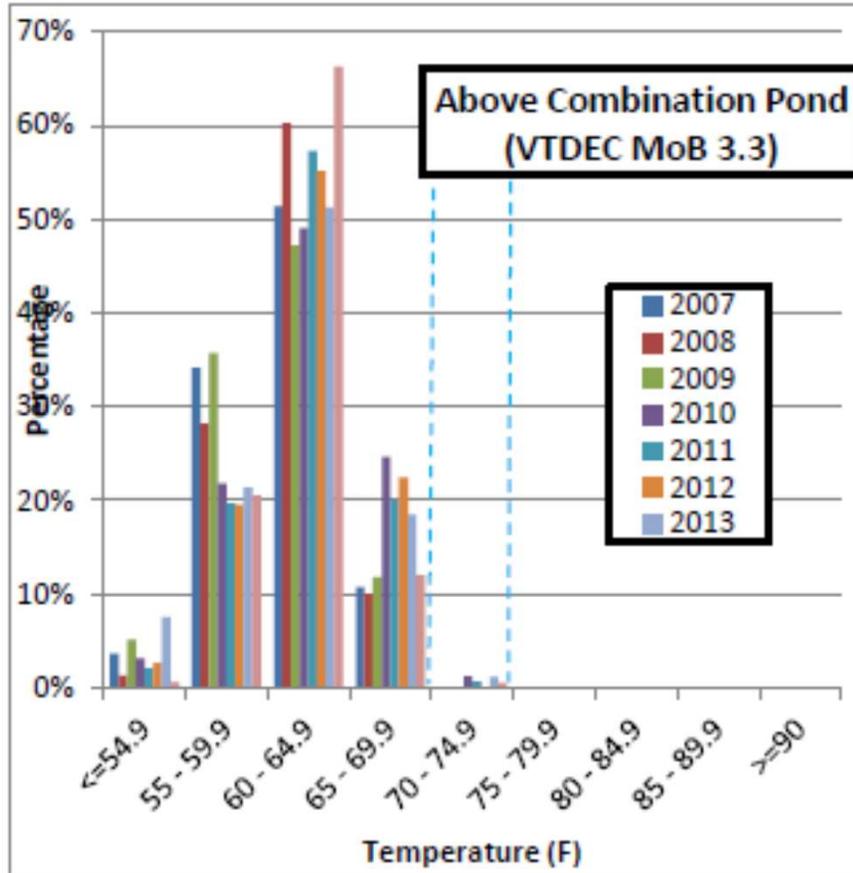
Legend

- █ On-Stream ponds
- █ Otter Creek
- █ Impaired Surface Waters
- █ Moon Brook and Tributaries
- Town Boundaries
- █ Major Roads
- █ Roads
- █ Moon Brook Watershed



Prepared by Bear Creek Environmental, LLC
Revision date January 5, 2012

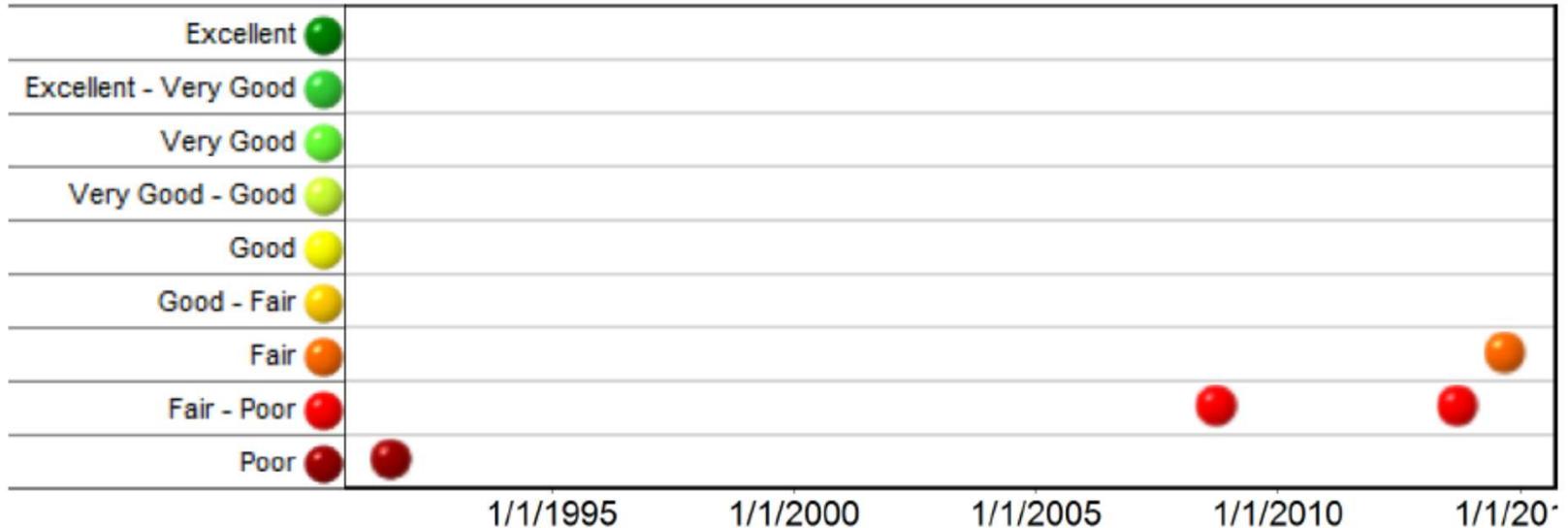
Water Temperature Monitoring



Biological Monitoring – Downstream of RT 7

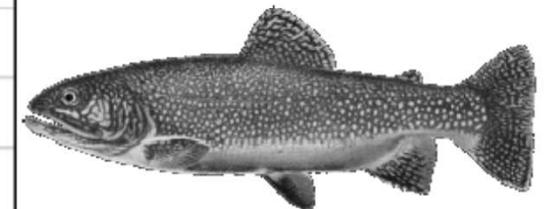
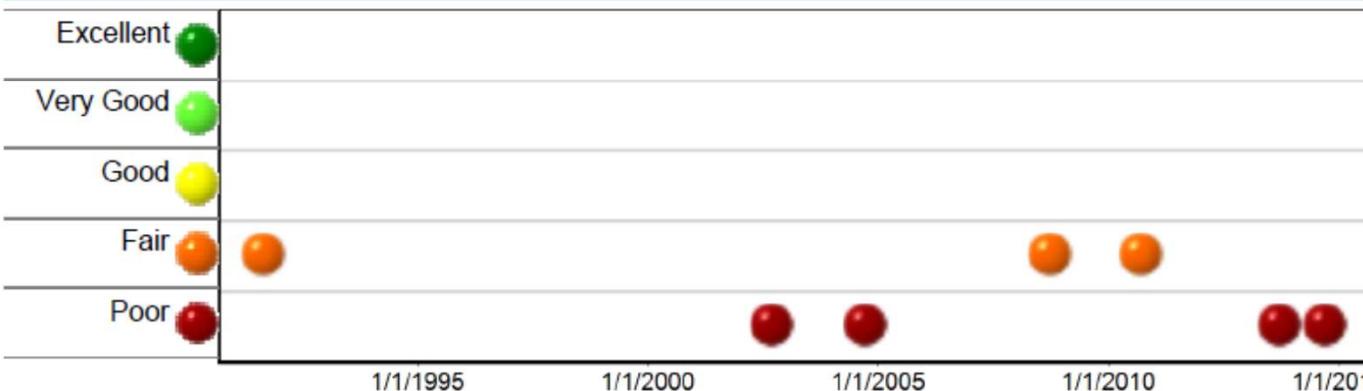
Macroinvertebrate Assessment

Macroinvertebrate population Assessments are a measure of the biological integrity of the macroinvertebrate community and an indicator of the health of the aquatic biota. (For More Details)



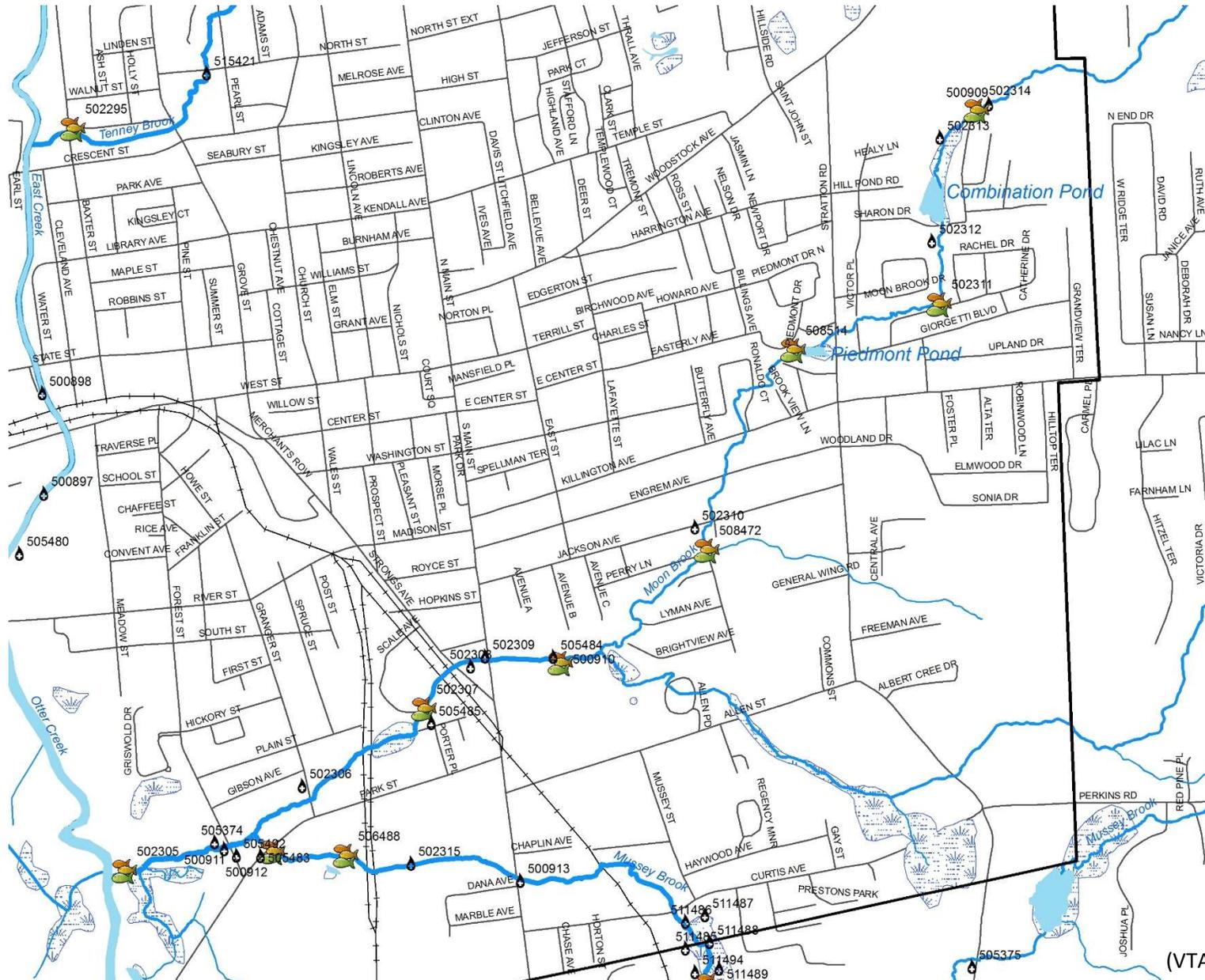
Fish Assessment

Fish populations provide a measurement of the general health of the aquatic biota. Since fish occupy the top of the food web their population integrates the conditions of lower community types. (For More Details)



(VTANR, Accessed 2016)

Monitoring Locations



(VTANR, Accessed 2016)

Additional Resources

Biological Monitoring –

<http://dec.vermont.gov/watershed>
<https://anrweb.vt.gov/DEC/IWIS/>

https://anrweb.vt.gov/PubDocs/DEC/WSMD/bass/docs/bs_Moon_Brook_Biological_Assessment.pdf

Physical Assessment - Moon Brook Corridor Plan (March, 2008) –

https://anrweb.vt.gov/DEC/SGA/report.aspx?rpid=61_CPA&option=download

<http://www.vacd.org/rcd/images/pdf/moon-brook-watershed-phase1and2-assessments.pdf>

Water Quality Monitoring and Assessment – Rutland NRCD website

Upper Otter Creek Watershed Council Water Quality Monitoring Reports

<http://www.vacd.org/rcd/environment/reports>

City of Rutland Moon Brook Info:

<http://www.rutlandcity.org/ponds>