

Lower Connecticut River Smaller Direct Watersheds
Updated water quality and watershed assessment information
October 2014

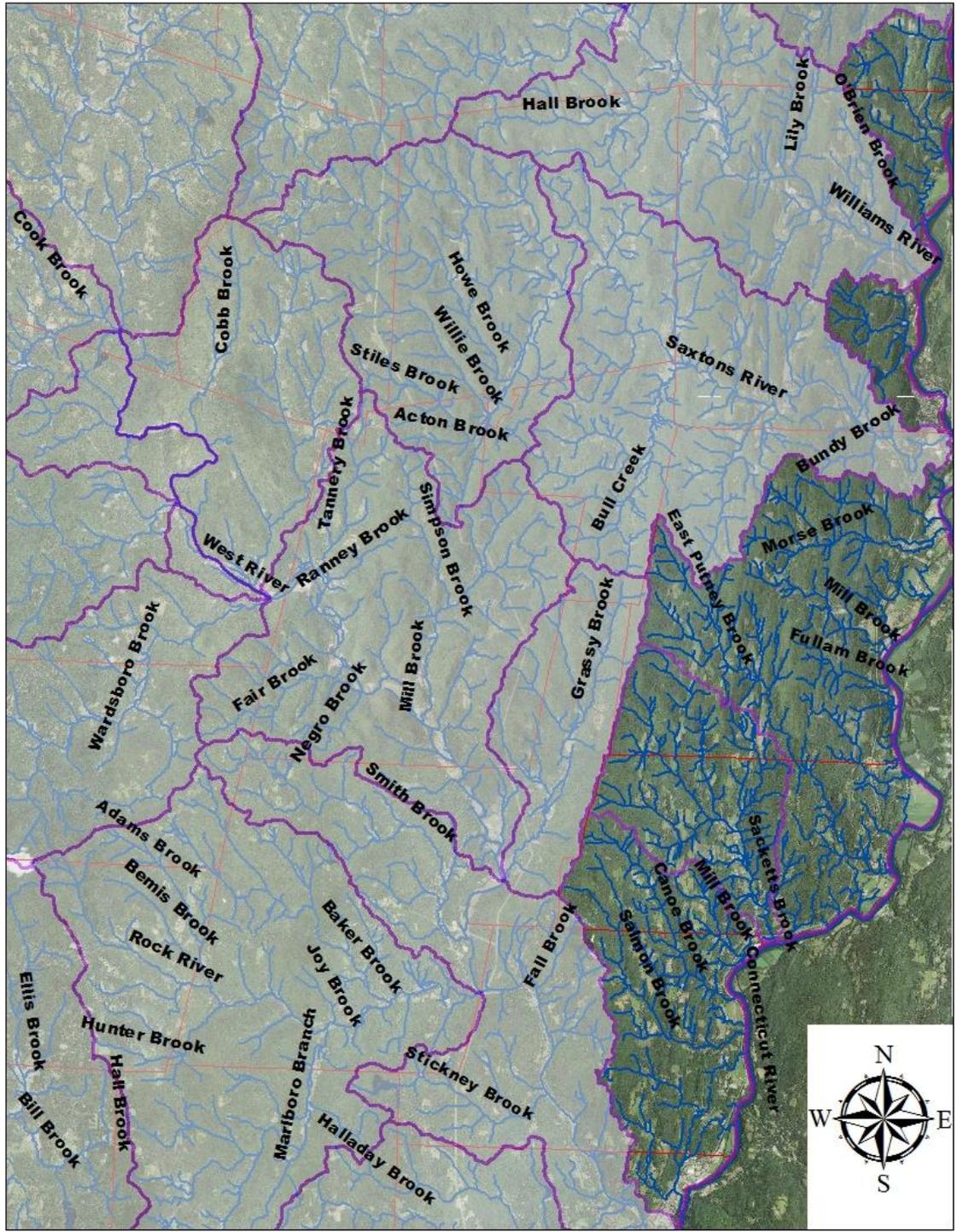


Figure 1. Streams draining directly to Connecticut River from Black to West River mouth

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General Description of Watershed Area and Streams

The tributaries to the Lower Connecticut River that are part of this assessment update include those from the mouth of the Black River in Springfield south to the mouth of the West River. This assessment update excludes the West, Williams, and Saxtons Rivers watersheds that are treated in separate reports. The streams are those in the state's waterbody database labelled waterbodies VT13-10 to VT13-13.

The streams include Commissary Brook, Newcomb Brook, Morse Brook, Mill Brook (Westminster), East Putney Brook, Sacketts Brook, Canoe Brook, Salmon Brook among others. The descriptions in the sections below start from the north, upstream on the Connecticut River, and go south or downstream.

The last water quality/aquatic habitat assessment report for Basin 13 streams was done in April 2002 and that report can be found [here](#). There was no basin plan done for Basin 13 but there was a Basin 12-13 (Deerfield River and Lower Connecticut River tributaries) plan done in March 2014 that included Crosby Brook information.

Lower Connecticut Tributary Segments with Impacts Summary

Table 1. Segments of the Lower Connecticut tributaries with impacts

Stream or lake segment	Mileage & Status	Pollutant	Source	Other Info.
Commissary Brook Trib, mouth of trib up	0.2 miles Impaired Part A List	sediment	old quarried area eroding	long history of discharging and no remediation
Crosby Brook, mouth up	0.7 miles Impaired Part A List	sediment, stormwater runoff	instream erosion & alteration, highway & other developed land	
Ellis Brook to Minards Pond	? length Altered Part F list	possible lack of minimum flow	Bellows Falls water supply	
Farr Brook to Minards Pond	? length Altered Part F list	possible lack of minimum flow	Bellows Falls water supply	
Sacketts Brook	1.5 miles Altered Part F list	artificial flow condition, insufficient flow below dam	Putney Paper water withdrawal	

Commissary Brook and other VT13-10 Streams

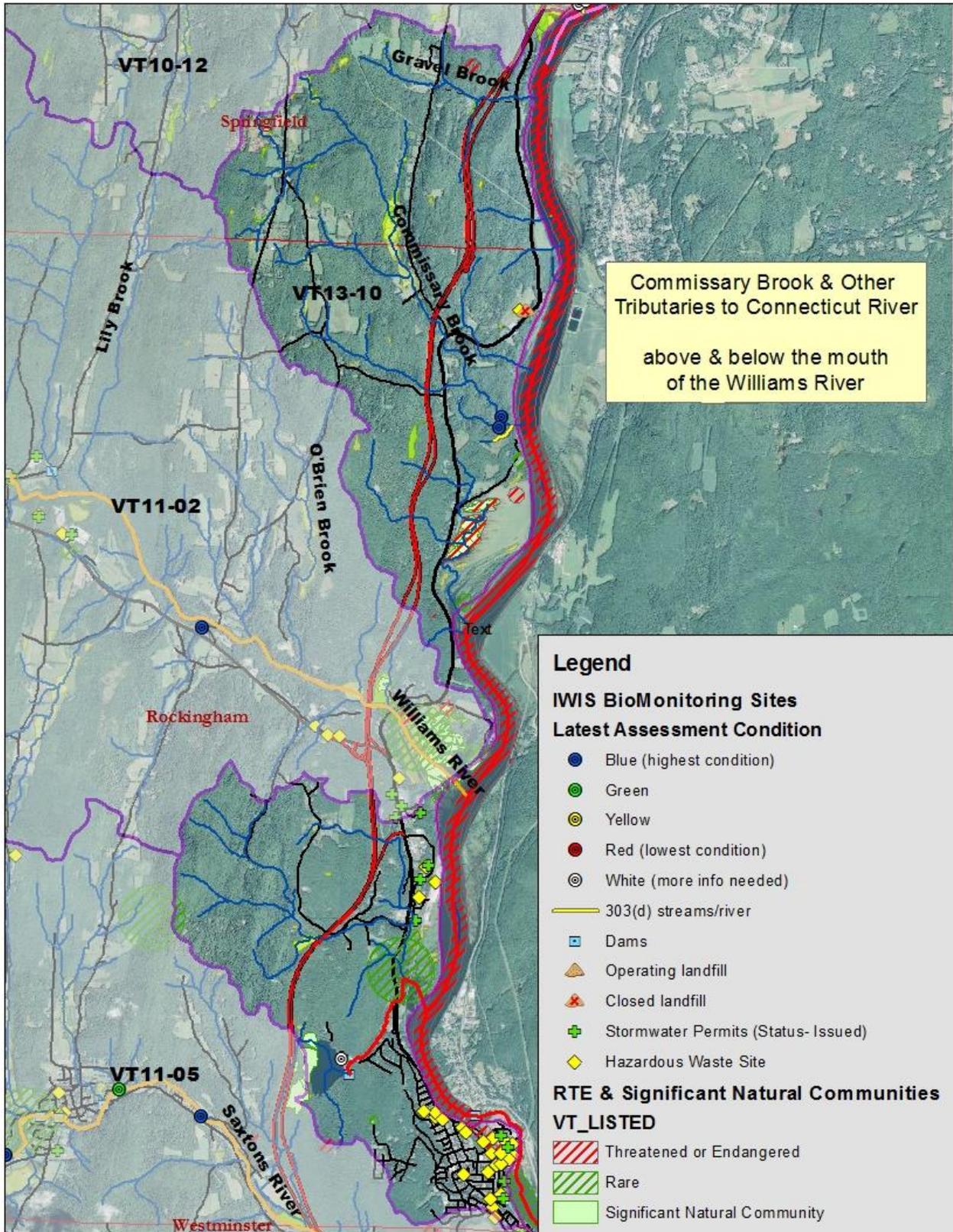


Figure 2. Commissary, Gravel and other brooks flowing to Lower Connecticut River

Assessment Information for Commissary Brook

Biological monitoring

Table 2. Biomonitoring sites on Commissary Brook and tributary

Waterbody id	Stream	Station	Date	Assessment	Community
VT13-10	Commissary Brook	rm 0.2	10/2/2008	exc-vgood	bugs
VT13-10	Little Commissary Brook	rm 0.1	10/2/2008	excellent	bugs

History of Erosion on Tributary to Commissary Brook

Stream Impairment

Trib to Commissary Brook and mouth of Commissary: 0.2 - aquatic habitat, aesthetics, wading, and fishing impaired due to sedimentation and turbidity from huge slumping banks due to forestland clearing and then gravel extraction with inadequate erosion controls.

History

Photos of huge clay banks sloughing and filling tributary 1 and the mouth of Commissary Brook with sediment essentially destroying the channel are the evidence for the impairment named above. The site was clearcut and then mined for its clay which changed the hydrology in that area, led to saturated and unstable soils as well as gullyng out the tributary. Massive slumping and erosion have resulted over the years and large plumes of highly turbid water discharge from the mouth of Commissary Brook into the Connecticut River. (See photo.) A brief history follows below.

Commissary Brook - 2009



A 55-acre site with tributary 1 on it above Commissary Brook received an Act 250 permit in 1993 for clearing 3 to 5 acres and removing up to 120,000 cubic yards of silt/clay per year for 10 years. In 1995 and 1996, the silt/clay was removed for a landfill cap. In 1998 and 1999, more of the site was cleared - up to 9 acres cleared at this time. In 2000, an abutting landowner noticed siltation of his right-of-way to the river from the Lillie pit and after an inspection, an NOAV was issued by the District Environmental Office. Through 2001 and 2002, runoff from the pit floor caused erosion and bank slumping. A long series of communication and complaints ensued with neighbors, a state representative, and state agencies. The landowner filed for Act 250 permit extension and to clear more and excavate more of the pit. Concerned neighbors and others hire a geologist and get NH, Vermont, and federal

agency people involved. The Act 250 permit amendment is withdrawn.

Throughout this time, plumes of turbid water entering the Connecticut River have been documented on a number of occasions. On November 7, 2003, there was a field visit to the site via the Connecticut River with NH enforcement personnel, the Conn River Watershed Council, a representative from Senator Jeffords office, Friends and Neighbors (an organized group now) and their geologist, and a rep from the Conn River Joint Commissions takes place. The damage is thoroughly documented with photos.

In January 2004, the NH DES inspector sends his report to the Friends and Neighbors geologist documenting that NH water quality standards are violated and that Vermont ANR should take the appropriate action to stop the problem. Communications amongst those concerned have continued but nothing has been done to stop the problem to date (February 2010).

Bellows Falls Water Supply

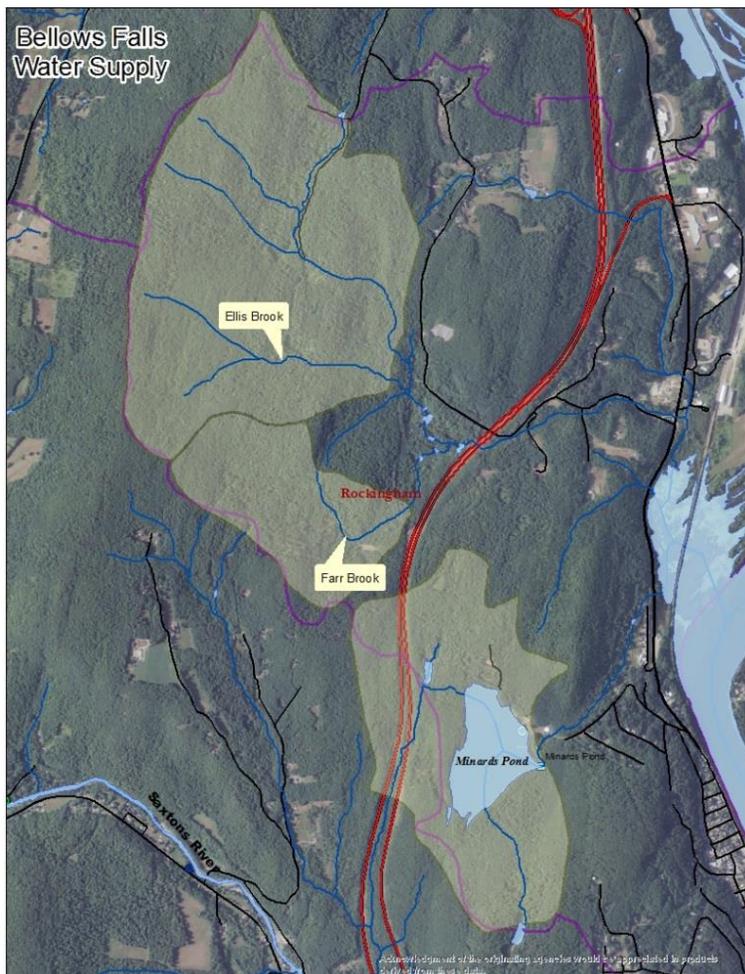


Figure 3. Streams and pond that comprise Bellows Falls water supply

Farr Brook and Ellis Brook, which are located east of Pleasant Valley Road and west of I-91, are part of the water supply system for Bellows Falls (WSID #5298). A pipe collects water from both of these brooks and some springs and carries it to Minards Pond on the east side of I-91. Minards Pond is the source from which the water is drawn, treated, and piped to Bellows Falls. The two brooks, their watersheds, Minard and Back Ponds and their watersheds are Class A2 waters. Minards Pond has a maximum yield of 800 gallons per minute (gpm) based on the pump rating and treatment plant design capacity.

East Putney Brook and Other Streams to the Connecticut River

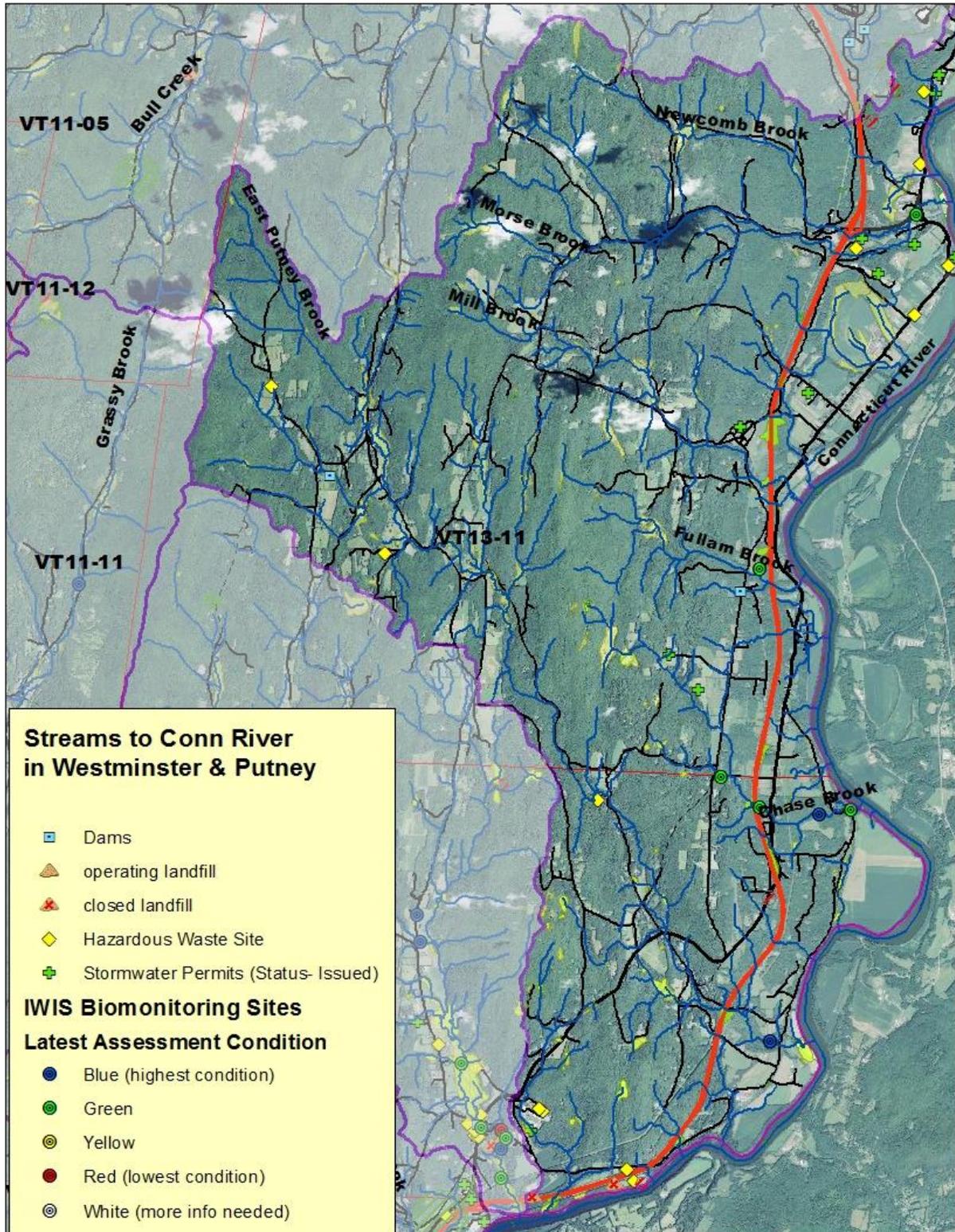


Figure 4. Streams to the Connecticut River in Westminster and Putney

Assessment Information for Chase, East Putney and Other Brooks

Biological monitoring

Table 3. Biomonitoring results from 2003 to 2012 for waterbody VT13-11 streams

Wbid	Stream	Station	Date	Assessment	Community
VT13-11	Chase Brook	rm 0.1	9/24/2003	good	macroinvertebrates
VT13-11	Chase Brook	rm 0.4	9/26/2003	poor	fish
VT13-11	Chase Brook	rm 0.4	9/26/2003	very good	macroinvertebrates
VT13-11	Chase Brook	rm 0.4	9/03/2004	poor	fish
VT13-11	Chase Brook	rm 1.0	9/25/2003	poor	fish
VT13-11	Chase Brook	rm 1.0	9/25/2003	good	macroinvertebrates
VT13-11	Chase Brook	rm 1.0	9/02/2004	poor	fish
VT13-11	Chase Brook	rm 1.0	9/03/2004	good	macroinvertebrates
VT13-11	Chase Brook Trib 4	rm 0.1	9/25/2003	vgood-good	macroinvertebrates
VT13-11	East Putney Brook	rm 0.3	9/25/2012	fair	fish
VT13-11	East Putney Brook	rm 0.3	9/25/2012	excellent	macroinvertebrates
VT13-11	Cobb Brook	rm 0.4	9/21/2012	good	macroinvertebrates
VT13-11	Fullam Brook	rm 0.7	9/24/2003	excellent	macroinvertebrates
VT13-11	Fullam Brook	rm 0.7	9/02/2004	vgood-good	macroinvertebrates

Table 4. Location of biological sampling points for VT13-11 streams

Stream	Rivermile	Location
Chase Brook	rm 0.1	100 meters above confluence with the Connecticut River, below the RR crossing
Chase Brook	rm 0.4	Above River Road crossing 100 meters
Chase Brook	rm 1.0	Midway between Route 5 and I-91 culvert crossings
Chase Brook Trib 4	rm 0.1	Located below Town Line Road
East Putney Brook	rm 0.3	150 meters above River Road large culvert & Boston/Maine RR
Cobb Brook	rm 0.4	About 150 meters upstream of Route 5
Fullam Brook	rm 0.7	Above Pine Banks Road

Table 5. Biomonitoring needed for waterbody VT13-11 streams

Stream or river name	Location/number of sites	Comments
Chase Brook	re-sample at sites done in 2003 & 2004	re-sample and if there is a discrepancy between fish and macroinvertebrate results still, figure out why fish are poor
East Putney Brook	sample again at rm 0.3 and also sample higher	
Mill Brook	sample at 1 location	have no biomonitoring
Morse Brook	sample at 1 location	have no biomonitoring

Sacketts Brook

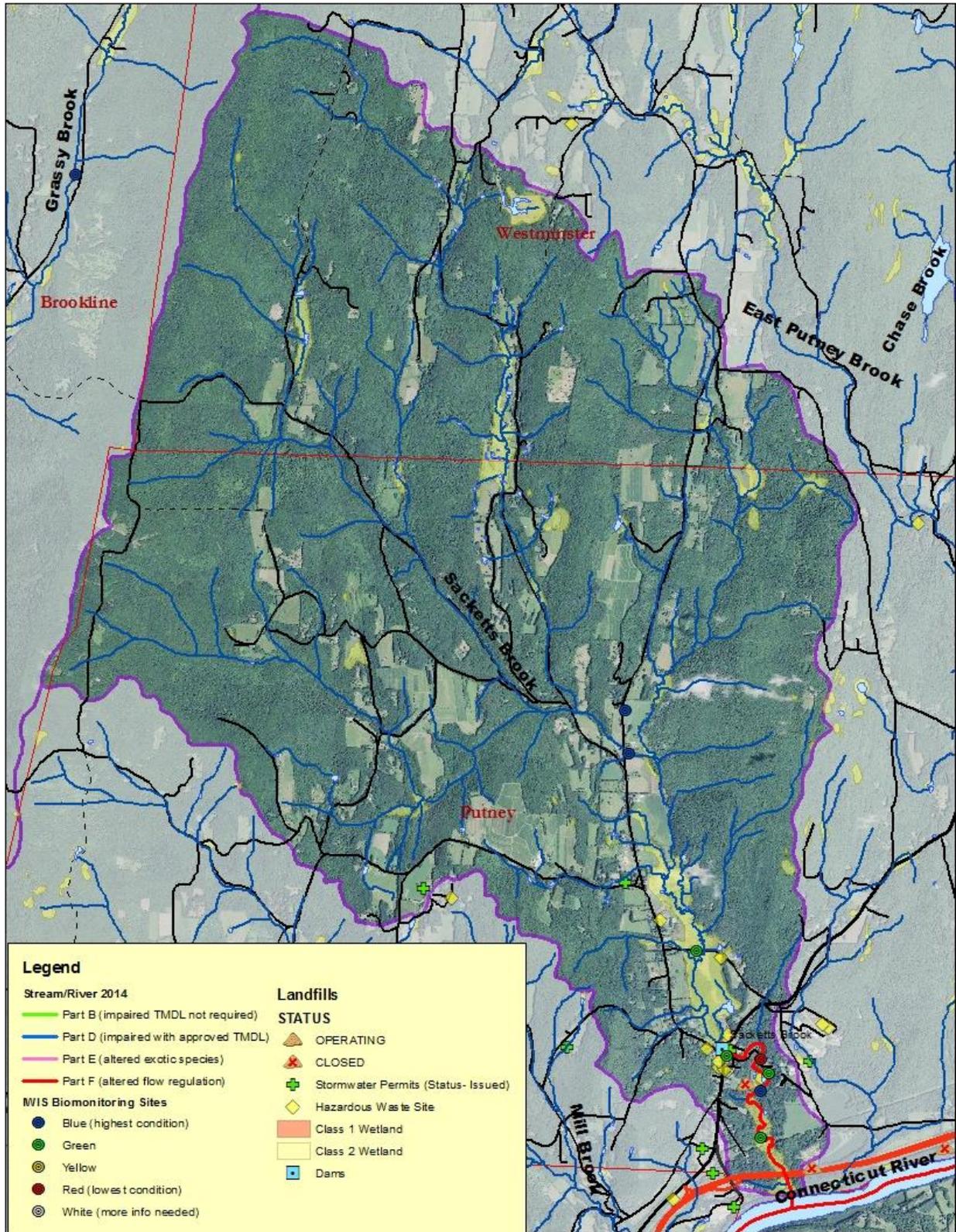


Figure 5. Sacketts Brook watershed

Assessment Information for Sacketts Brook

Biological Monitoring

Table 6. Biological monitoring assessment results 1992 – present on Sacketts Brook.

	Rm 0.5	Rm 0.8	Rm 0.9	Rm 1.0	Rm 1.2	Rm 1.9	Rm 3.0	Rm 3.5
1992b	---	---	---	poor	fair	---	---	---
1995b	---	---	---	poor	---	---	---	---
1995f	---	---	---	good	---	---	---	---
1996b	---	---	---	fair-poor	good	---	---	exc
1998	---	---	---	poor	---	---	---	---
2003b	---	very good	---	---	---	---	---	---
2003f	---	very good	---	---	---	---	---	---
2008b	---	---	very good	---	---	good	exc-vgood	---
2008f	---	---	good	---	---	---	---	---
2012b	good	---	vg-good	---	---	---	---	---
2012f	good	---	---	---	---	---	---	---

Table 7. Sacketts Brook biomonitoring site locations

Rivermile	Location
rm 0.5	below Putney WWTF about 50 meters
rm 0.8	below Putney Paper Mill treatment ponds
rm 0.9	adjacent to paper mill treatment ponds between two road forges
rm 1.0	above paper mill treatment ponds and road forge but below bridge and about 200 m below Putney Paper Plant
rm 1.2	located on bedrock falls at Route 5 bridge
rm 1.9	above Putney below first bridge crossing
rm 3.0	below Westminster road bridge
rm 3.5	below the "Kettle" at the confluence with a major tributary to the NW

History of impacts and restoration at Putney Paper

In 1992, Vermont DEC macroinvertebrate sampling site below Putney Paper Mill (1.0) had poor macroinvertebrate community richness and EPT values - there was a lot of algae and the water was blue-green in color at the site. Low EPT density values "strongly indicate a toxic impairment." Sampling in 1995, 1996 and 1998 all showed non-support (community assessment of "poor") as well. Aquatic biota at site 3.5 well above the mill was fully supported in 1996.

Vermont DEC fish sampling was done in 1986, 1988, and 1995. Around rivermile 0.9 in 1986, the fish community was found to be in "fair" condition; at rivermile 0.8 in 1988, it was in "fair" condition; and at rivermile 1.0 in 1995, it had improved to "good" condition.

By the 2002 assessment update, Putney Paper Mill's discharge pipe (treated paper mill waste), which ran from the plant to the Connecticut River, had been replaced and was no longer considered a problem. The pipe runs along the edge of Sacketts Brook and used to break and leak. The company had also de-commissioned 2 1/2 of 3 lagoons - it has re-lined a portion of one for emergency use.

The table above shows the results from biological monitoring over the years.

Other related information

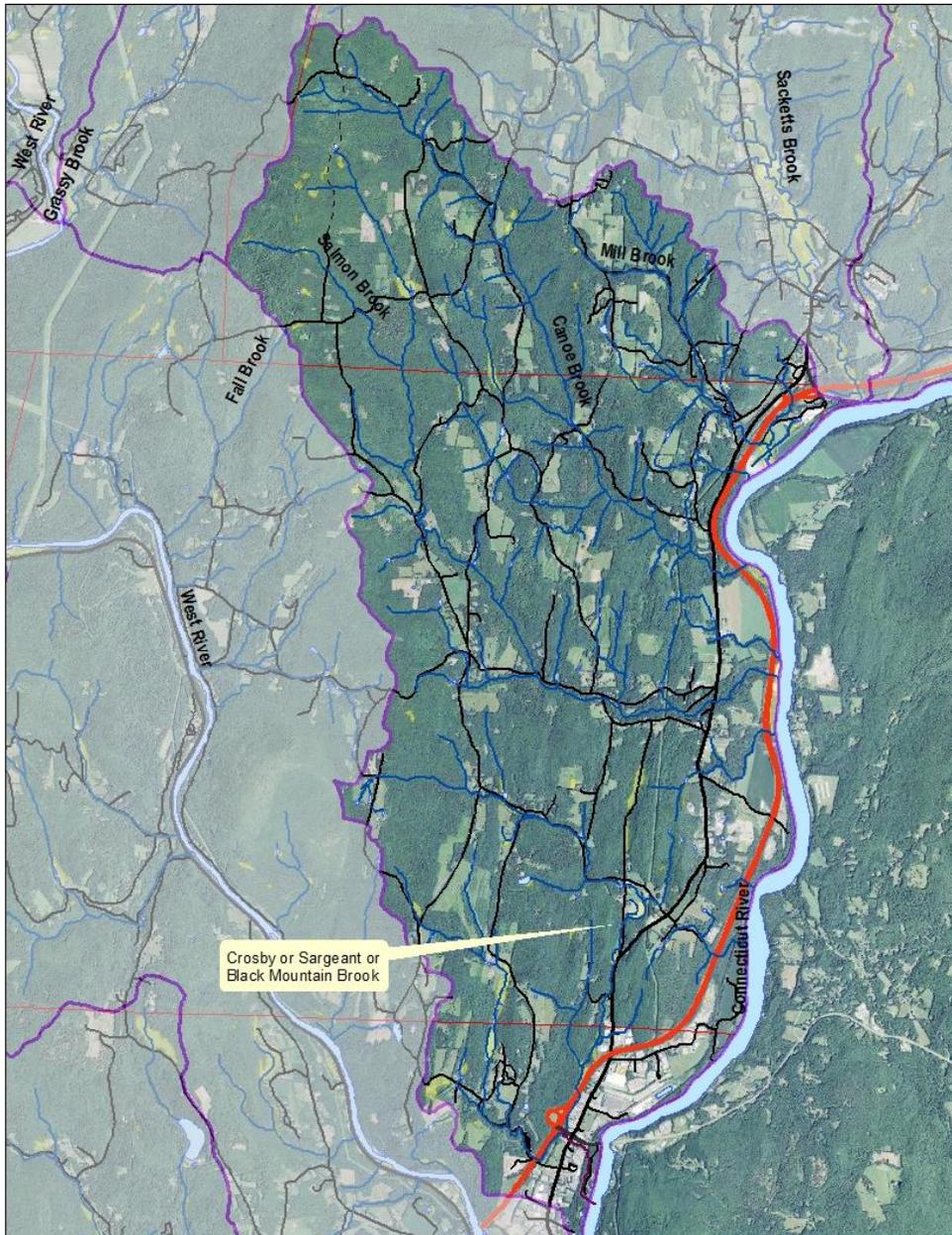
The former Putney Paper Company was purchased by Soundview Vermont Holdings in March 2013. The facility is now called Soundview Paper Company. The renewed permit for Soundview Paper was signed on February 22, 2013 and it expires December 31, 2017.

The Putney Wastewater Treatment Facility's permit was issued in October 2006 and expired in December 2011. The facility was built in the 1970s and partially upgraded in 2006. The chemical storage building is in need of replacement as seen during a recent inspection (March 2013). Wastewater treatment facility permits that discharge to the Connecticut River or to tributaries to the Connecticut River are currently in a state of limbo due to the Long Island Sound TMDL development process.

There is a water withdrawal from Sacketts Brook upstream of Route 5 and the dam above Route 5. It is not yet known the size and nature of the withdrawal.

Crosby Brook and other VT13-13 Streams

Crosby Brook (also known as Black Mountain Brook or Sargeant Brook) is a direct tributary to the Connecticut River in Dummerston and Brattleboro. The brook begins when a set of small headwater tributaries from unnamed hills in Dummerston join together. The brook then flows southeasterly and southerly through a portion of Brattleboro to the Connecticut River entering just below the Route 9 bridge to New Hampshire. The brook is about six miles long and drains a watershed of about 15 square kilometers. The South Branch Crosby Brook, which drains a 4.5 km² watershed, enters Crosby Brook just below the I-91 exit above the junction of Routes 5 and 9.



Salmon Brook begins in the southwestern edge of Putney and flows east then southeasterly into Dummerston and south, southeast, and east into the Connecticut River.

Canoe Brook begins near the Brookline/Putney line and flows southeasterly into Dummerston and then on into the Connecticut River north or upstream of Salmon Brook's confluence.

Mill Brook also begins in Putney and flows into Dummerston before reaching the Connecticut River. This stream is north or upstream of Canoe Brook.

Figure 6. Mill, Canoe, Salmon, Crosby Brooks subwatershed

Assessment Information

Biological Monitoring

Crosby Brook

Table 7. Biomonitoring assessment results from Crosby Brook

	Rm 0.3	Rm 0.4	Rm 0.5	Rm 0.7	Rm 1.3	Rm 1.5	Rm 1.8
2003 b	fair	fair	---	----	---	fair	----
2003 f	poor	---	poor	---	---	excellent	---
2004 b	poor	good-fair	---	good-fair	---	good-fair	exc-vgood
2004 f	poor	good	---	fair	---	very good	
2012 b	fair-poor		---	---	fair	---	---

Table 8. Biomonitoring assessment results from South Branch Crosby Brook

	Rm 0.1	Rm 0.5	Rm 1.3
2003b	---	exc-vgood	---
2003f	---	excellent	---
2004b	good	very good	very good
2004f	good	excellent	----
2012b	---	exc-vgood	---

Table 9. Biomonitoring sampling locations on Crosby Brook

Stream name	River-mile	Description
Crosby Brook	0.3	Adjacent to Connecticut River (private) across from first house
Crosby Brook	0.4	Above RR bridge to below Route 5 50 meters, adjacent to parking lot for restaurant
Crosby Brook	0.5	Just below confluence with South Branch, below I-91 exit ramp 100 meters
Crosby Brook	0.7	Above I-91 exit ramp at roundabout, behind Pizza Hut and car dealers
Crosby Brook	1.3	Above I-91 just before exit ramp 3 southbound, site above small drainage entering Crosby from the east.
Crosby Brook	1.5	Behind and adjacent to or slightly above Leader Distribution Building
Crosby Brook	1.8	Located above 1 st middle road crossing 20 meters.
South Branch Crosby Brook	0.1	Above confluence with Crosby Brook, adjacent to and between I-91 and cemetery
South Branch Crosby Brook	0.5	Above I-91 and first bridge on Black Mountain Road, adjacent to trailer park on Black Mountain Road
South Branch Crosby Brook	1.3	Above Dickinson Road 20 meters, adjacent to older college building.

Conclusions from a 2005 report on the biota conclude that: “two stressors, sediment and temperature, have been shown to increase significantly longitudinally, and to be at levels high enough at rivermile 0.3 to be stressful to aquatic life. In the case of sediment, it appears that during high flows, the South Branch begins to carry a significant sediment load from areas above SBCB 0.5. The stream runs immediately adjacent to a long reach of gravel road immediately above this site. On Crosby Brook proper, sediment measures

appear to significantly increase at CB rm 0.6. This is the first reach on Crosby Brook that is within a more urban land use setting and receives stormwater runoff... Sediment addition to the stream is clearly related to freshet runoff events....Temperature has been shown to be high enough at the lowest site CB0.3 to be stressful to cold-water aquatic life.”

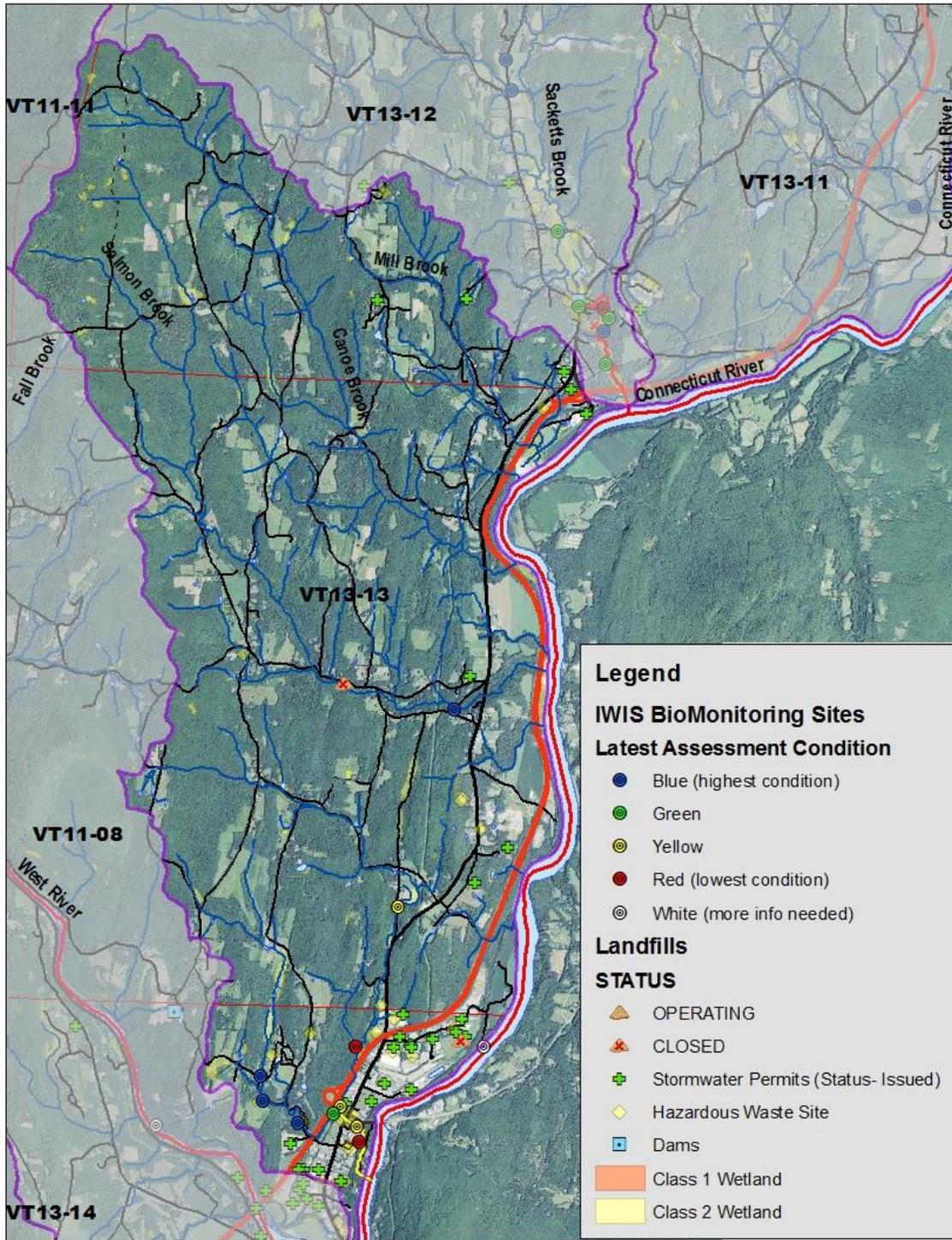


Figure 7. Mill, Canoe, Salmon, Crosby Brooks subwatershed with assessment information

Salmon Brook

Salmon Brook was sampled below an old bridge west of Route 5 near the elementary school in Dummerston in 1992 and then again in 2012. In 1992, the macroinvertebrate community was “excellent-very good” and then in 2012, the reach improved in richness and EPT resulting in an “excellent” assessment. Six of the 10 6/10 dominant taxa are water quality sensitive. The silt rating was excellent 1/5, and the periphyton community is dominated by moss. Water quality chemistry samples show the stream has a strong alkalinity >50mg/l. Nutrients were low as was chloride. Overall this is a very high quality water.

Physical Stream Assessments

A Phase 1 and Phase 2 Assessment of Crosby Brook and the South Branch Crosby Brook was done by Fitzgerald Environmental. Information in this section is taken from Fitzgerald reports listed below. A total of 16 reaches were identified during the Phase 1 analysis for the 10.1 mile channel network. Based on an analysis of impact ratings generated from the Phase 1 data, 9 reaches were selected for further Phase 2 assessment in 2008, including 6 reaches on the mainstem and 3 reaches on the South Branch.

During the Phase 2 surveys, the division of mainstem reaches resulted in a total of nine segments, while the division of South Branch reaches resulted in a total of seven segments. Each segment was walked entirely and detailed physical data were collected using the SGA Phase 2 methods. This included a summary of geomorphic stability (RGA rating), habitat conditions (RHA rating), and channel evolution stage and stream sensitivity. Of the nine segments analyzed on Crosby Brook, a stretch of three segments (M01-B – M03) had a fair or poor RGA and RHA condition and two other segments (M05 and M06-A) had a fair condition for one of the two assessments. Eight of the nine segments were rated high, very high, or extreme sensitivity. Of the seven segments on the South Branch, five of the seven had fair or poor (only one) as the RGA and RHA conditions with one segment having good for both and one segment having reference for both.

Information Sources

The Biotic Condition of Crosby Brook and the Exploration of the Environmental Stressors on the Aquatic Communities, June 2005. Vermont DEC WQD BASS, Waterbury, Vermont.

Crosby Brook Phase 1 Stream Geomorphic Assessment Report, October 2007. Prepared for the Windham County Natural Resources Conservation District by Fitzgerald Environmental Associates, LLC, Colchester, Vermont.

Crosby Brook Phase 2 Stream Geomorphic Assessment Summary, July 2008. Prepared for the Windham County Conservation District by Fitzgerald Environmental Associates, LLC, Colchester, Vermont.

Crosby Brook Watershed Stream Corridor Restoration Plan, June 2009. Prepared for the Windham County Conservation District by Fitzgerald Environmental Associates, LLC, Colchester, Vermont.