

Lewis Creek - 2013 Water Quality Summary Addison County Riverwatch Collaborative

The Addison County Riverwatch Collaborative has been monitoring water quality in the Lewis Creek since 1992. For the 2012 and 2013 seasons, Lewis Creek was the subject of a more intensive monitoring focus, where rotational as well as sentinel stations were monitored and additional parameters were tested. Two sentinel sites (LCR3.7 and LCR14) and six rotational sites located on the main stem and Pond Brook tributary were sampled (see table at right).

Site	Location	Town
LCR3.7	Old Route 7 Bridge	Ferrisburgh
LCR9.9	Upper Covered Bridge, Roscoe Rd.	Charlotte
LCR14	Tyler Bridge	Monkton
LCR17.2	Starksboro Ballfields	Starksboro
LCR18.6	Lewis Creek Farm footbridge	Starksboro
LCR19.5	Parsonage Road bridge	Starksboro
LCR27.8	Hillsboro Road	Starksboro
LCT3D.5	Silver Street culvert	Monkton

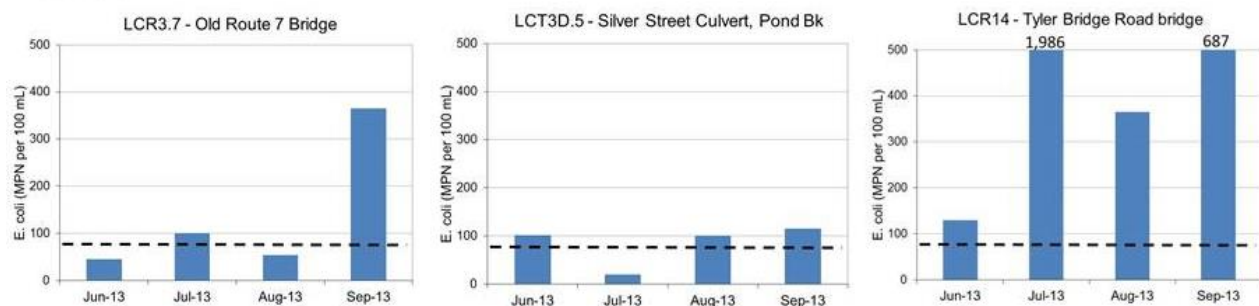
In 2013, six new stations were established in the headwaters of the Lewis Creek watershed to evaluate baseline water quality conditions in the upper main stem and the Hillsboro Brook, High Knob Brook, Hogback Brook, Hollow Brook and Pringle Brook tributaries in support of biomonitoring studies to be carried out by the VT Agency of Natural Resources (VTANR). Results of this special study will be separately reported by VTANR.

During 2013, sampling occurred on two spring dates (April 3 and May 1) and four summer dates (June 5, July 10, August 7, and September 4). The spring and early summer dates represented moderate flow conditions on the river, based on records from the USGS streamflow gage located at the Route 7 crossing. August and September sample dates captured baseflow conditions, while the July 10 event captured moderate to high flows following a storm event on July 3-4 and higher-than-normal May and June rainfall. On an average annual basis, flows in 2013 were near normal in the Addison County watersheds monitored by the Collaborative. Samples from the Lewis Creek watershed were tested for E.coli, total phosphorus, total nitrogen, and turbidity; E.coli and Total Nitrogen were tested only on the summer dates. As part of the special study of biocriteria, alkalinity was tested at select sites during the September event only.

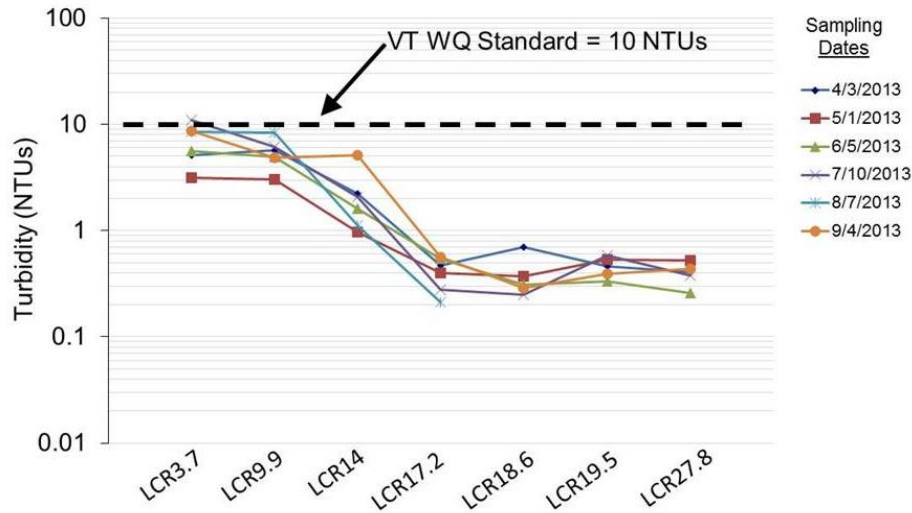
E.coli counts in the Lewis Creek at three select sites exceeded the state standard of 77 organisms/100 mL on a majority of the sample dates. E.coli results exceeded the federal health standard of 235 MPN/100 mL at LCR3.7 during the September event, and at LCR14 on three out of the four summer sampling events. Detected E.coli counts at these sites in the 2013 season were largely consistent with historic results.

E.Coli

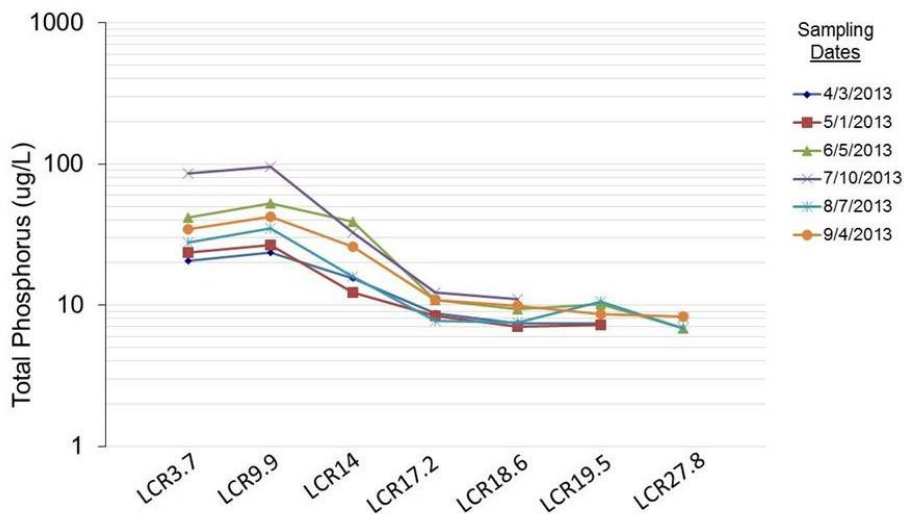
Vermont State Standard = 77 MPN / 100 mL



Turbidity levels in the Lewis Creek at the sampled stations ranged from <0.2 to 10.9 NTUs, with a mean level of 2.6 NTUs for the six sample dates. Turbidity levels exceeded the Vermont state standard of 10 NTUs (for Class B cold-water fisheries) at station LCR3.7 on July 10; flows were moderate due rains on July 3-4. The graph below shows turbidity levels from upstream (right) to downstream (left) for the stations along the main stem of the Lewis Creek. Based on past years' sampling results, turbidity can increase above the standard at times of increased flow – during a summer thunderstorm, or during spring runoff conditions – especially in the lower reaches of the river. An increasing trend in turbidity with distance downstream is generally observed during all flow conditions.



Phosphorus was detected at low to moderate concentrations during the six Spring and Summer sampling dates, ranging from 6.8 to 252 ug/L, with an average of 32 ug/L. The mean concentration of Total Phosphorus for the two available low-flow summer sample dates at the Pond Brook site LCT3D.5 exceeded the proposed criteria of 44 ug/L for the warm-water medium gradient (WWMG) wadeable stream ecotype in Class B waters. The graph below shows total phosphorus levels from upstream (right) to downstream (left) for the stations along the main stem of the Lewis Creek. An increasing trend in phosphorus concentration is evident with distance downstream.



Nitrogen levels were detected at very low concentrations during the six spring and summer sampling dates, well below the state standard for nitrogen as nitrate (5 mg/L). Concentrations ranged from 0.13 to 0.99 mg/L, with an average of 0.5 mg/L. The mean value of the two available low-flow summer sample results at site LCR19.5 was above the recently proposed instream nitrogen criteria of 0.75 mg/L for WWMG wadeable stream ecotype in Class B waters.

2014: In years 2014 through 2017, the Lewis Creek watershed will rotate back to a reduced frequency of monitoring at two sentinel stations, LCR3.7 and LCR14. The Addison County Riverwatch Collaborative will sample for total phosphorus, turbidity, and E.coli.

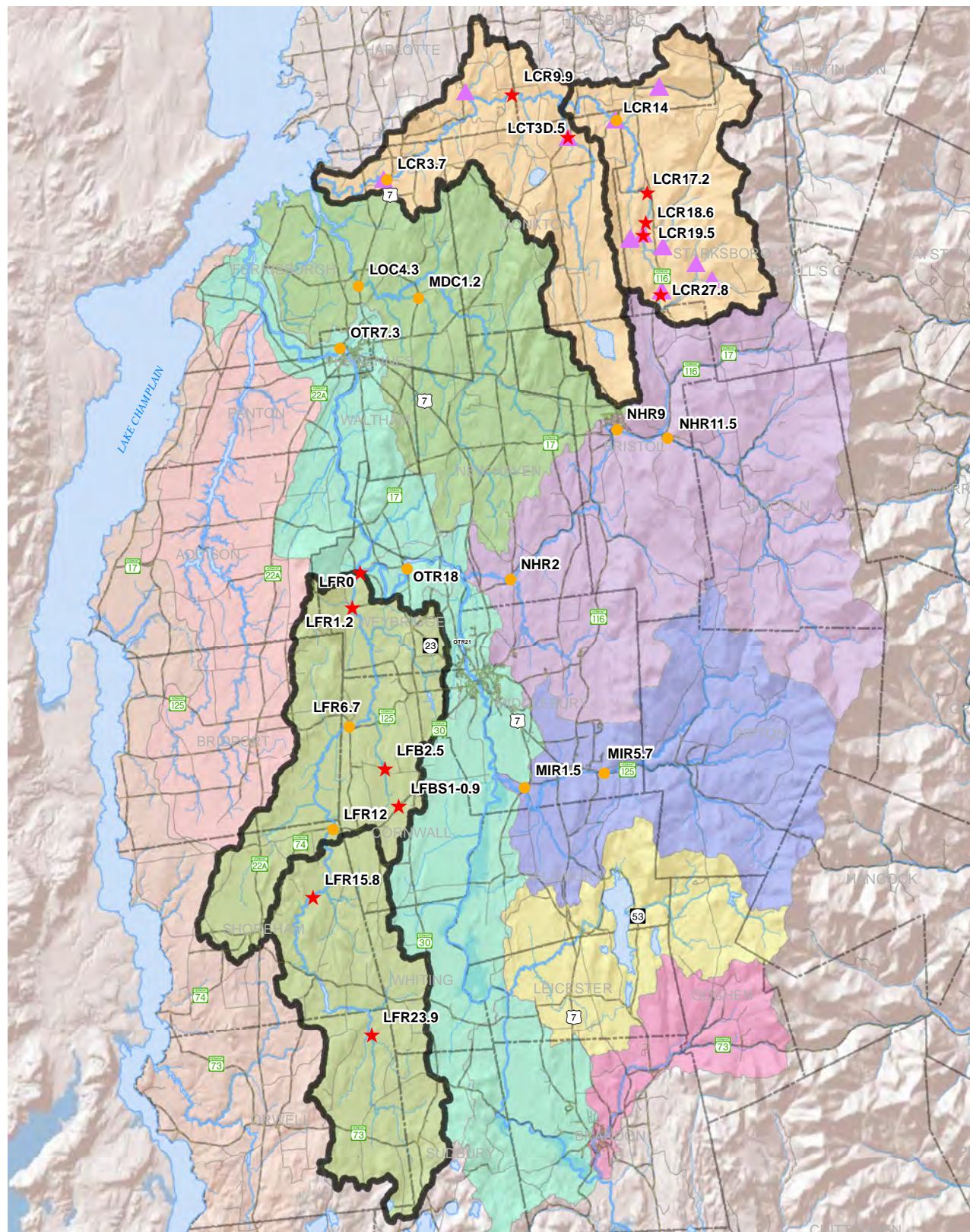
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or visit our web page at: www.acrpc.org/acrwc

Addison County Riverwatch Collaborative

Water Quality Monitoring Sites by Watershed, 2013



ACRWC 2013 Sampling Sites

- ★ Rotational Basin Site 2013
- Sentinel Site
- ▲ Biomonitoring Study Site

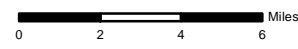
Rotational Basins 2013

- ◻ Lemon Fair River
- ◻ Lewis Creek

- Orange box: Lake Champlain direct
- Yellow box: Lewis Creek
- Light Green box: Little Otter Creek
- Light Blue box: Otter Creek
- Purple box: New Haven River
- Pink box: Dead Creek
- Light Green box: Lemon Fair River
- Yellow box: Leicester River
- Blue box: Middlebury River
- Pink box: Neshobe River

Roads

- Pavement
- Gravel



The Addison County Riverwatch Collaborative is a citizen organization whose mission is to collect and assess the water quality of Vermont surface waters, and to facilitate water quality and stream corridor improvement measures on a watershed scale.