## Addison County Riverwatch Collaborative Lewis Creek - 2012 Water Quality Summary

The Addison County Riverwatch Collaborative has been monitoring water quality in the Lewis Creek since 1992. For the 2012 and 2013 seasons, Lewis Creek is the subject of a more intensive monitoring focus, where rotational as well as sentinel stations are monitored and additional parameters are tested. During 2012, sampling occurred on two spring dates (April 4 and May 1) and four summer dates (June 6, July 11, August 1, and September 5). Samples were tested for phosphorus and turbidity. E.coli was tested at select stations (LCR3.7, LCT3D.5, and LCR14) only on the Summer dates. Flow in the river during all summer dates and the April spring date represented low to baseflow conditions (based on the USGS streamflow gage at the Route 7

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

crossing). Flows on the May date were moderate due to spring rains. In general, flows in 2012 were below normal, due to the lower than normal rainfall and snowpack within the year.



E.coli counts in the Lewis Creek at the three select sites exceeded the state standard of 77 organisms/100 mL on the August 1 and September 5 sample dates. The standard was exceeded on June 6 at the Pond Brook station (LCT3D.5) and Tyler Bridge Road (LCR14) and on July 11 at LCR14. E.coli results exceeded the federal health standard of 235 MPN/100 mL at all three stations on September 5, at LCT3D.5 and LCR14 on August 1, and on July 11 at LCR14. Detected E.coli counts at these sites in the 2012 season were largely consistent with historic results. E.coli counts can become elevated particularly during low flow conditions in the warmer summer months. A similar occurrence of elevated E. coli counts was noted in historic drought years – e.g., 1993 and 1995.



Turbidity levels in the Lewis Creek at the sampled stations ranged from <0.2 to 61.4 NTUs, with a mean level of 8.0 NTUs for the six sample dates. Turbidity levels exceeded the Vermont state standard of 10 NTUs (for Class B cold-water fisheries) at stations LCR9.9 and LCR14 on May 1; flows were moderate due to spring rains. All sites exceeded the standard during low flow conditions on September 5. The graph at left shows turbidity levels from upstream (right) to downstream (left) for the stations along the main stem of the Lewis Creek. During the generally low flow conditions of the 2012 season, a slight increasing trend in turbidity was evident with distance downstream.

## Vermont State Standard = 77 MPN / 100 mL

Phosphorus was detected at low to moderate concentrations during the six Spring and Summer sampling dates, ranging from 5 to 282 ug/L, with an average of 51 ug/L. The mean concentration of Total Phosphorus for the four available low-flow Summer sample dates (June 6, July 11, August 1, and September 5) at six of the seven Lewis Creek main stem sites (all except LCR27.8) exceeded the proposed criteria of 44 ug/L for the warm-water medium gradient (WWMG) wadeable stream ecotype in Class B waters. Mean values were particularly influenced by the elevated concentrations detected on September 5. The graph at right shows total phosphorus levels from upstream (right) to downstream (left) for the stations along the



main stem of the Lewis Creek. During the generally low flow conditions of the 2012 season, an increasing trend in phosphorus concentration was evident with distance downstream.

**Pond Brook study**: In 2012, a flow monitoring study was carried out in the Pond Brook tributary (LCT3) of Lewis Creek to support restoration and conservation project identification and prioritization. Pond Brook has been identified as a major sediment and phosphorus loader to the Lewis Creek watershed based on Spring / Summer water quality monitoring from 2004 to present (Hoadley, 2011; available at: <u>http://lewiscreek.org/lewis-creek-water-quality</u>). Total Phosphorus concentrations have consistently been above levels which would suggest nutrient enrichment, and have been above the proposed instream nutrient criteria (44 ug/L) for Class B "warm-water medium-gradient" wadeable streams (VTDEC WQD, 2009). The study involved storm event sampling during spring and fall months. Full results will be reported separately in the spring of 2013.



As part of this study, three additional water quality stations were established in the Pond Brook subwatershed to complement the existing rotational site (LCT3D.5) located at the Silver Street crossing of Pond Brook. These stations were sampled on the same dates as the main stem sites. The graph at left shows total phosphorus levels from upstream (right) to downstream (left) for the stations along the Pond Brook. During the generally low flow conditions of the 2012 season, Pond Brook TP concentrations (at LCT3D.5) were greater than the main stem concentrations (at LCR14) on April 4, June 6, July 11, and August 1 and may have accounted in part for the increase in TP concentrations on the main stem between LCR14 and LCR9.9.

**2013:** A more intensive monitoring focus continues in the Lewis Creek for the 2013 season, where rotational as well as sentinel stations will be monitored and additional parameters tested. Six new stations in the headwaters of the Lewis Creek watershed have been established 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 funded in a subsequent year. At these new sites, along with five existing sites which will double as biomonitoring sites, the Addison County Riverwatch Collaborative will sample for Alkalinity, Total Phosphorus, Total Nitrogen, and Turbidity as well as field parameters including temperature and conductivity.

For more information, contact the Lewis Creek sampling coordinator: Louis DuPont, 453-5538, ldupont@gmavt.net http://acrpc.org/addison-county-river-watch-collaborative/contact

## Addison County Riverwatch Collaborative Water Quality Monitoring Sites by Watershed, 2012



ACRPC 1/2012