STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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Lower Farmington River/Salmon Brook
Wild & Scenic Study
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April 15, 2009

Ms. Kennedy Raymes,

This letter is in response to your request for water quality information to support Wild and Scenic designation for the lower Farmington River and Salmon Brook. The Connecticut Department of Environmental Protection (CT DEP), Bureau of Water Protection and Land Reuse (WPLR) is responsible for the collection, analysis and reporting of water quality of rivers and streams within the state as required by section 305(b) of the Federal Clean Water Act. To meet this obligation, WPLR collects a variety of water quality data including water column chemistry and biological data such as indicator bacteria, macroinvertebrate and fish community structure. The analysis and interpretation of these data are presented in the Integrated Water Quality Report to Congress as the degree of support for each designated use. The resulting use support assessments are published to the public and EPA in the Integrated Water Quality Report every 2 years. The most recent report was published in August 2008 and is available on the web at http://www.ct.gov/dep/lib/dep/water/water_quality_management/305b/2008_final_ct_integratedwqr.pdf. This complete data assessment process is described in the consolidated assessment listing methodology (CALM) also available on the web at http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325610&depNav_GID=1654.

Relative to water quality conditions across the state, the lower Farmington River and Salmon Brook are significant high quality resources. Both harbor exceptional macroinvertebrate and fish communities largely unparalleled in Connecticut.

Ongoing monitoring programs:
The ambient water quality monitoring program is described in "Connecticut Comprehensive Water Quality Monitoring Strategy" available on the web at: http://www.ct.gov/dep/lib/dep/water/water_quality_management/ct_comp_amb_wtr_qual_monit_strat.pdf. WPLR implement both a targeted sampling design and a probabilistic sampling design in order to select locations to collect water quality data. These data are used to make use support assessments. Credible data are also obtained from citizen-based programs, academic institutions, and the USGS. All data are compiled and compared to CT DEP water quality standards using the criteria presented in the CALM.

Water quality sampling covers physical, chemical, and biological parameters. Chemical data include chloride, hardness, alkalinity as well as nitrogen and phosphorous constituents. A single discrete grab sample is collected concurrent with fish community work (summer) and macroinvertebrate community work (fall). Biological data include fish community collected via electrofishing gear and macroinvertebrates community data collected from approximately 2 m^2 of riffle substrate. Data are compared to state water quality standards using the CALM as guidance. The resulting assessments are published to the public and EPA in the integrate water quality report every 2 years. The most recent report is was published in August 2008. http://www.ct.gov/dep/lib/dep/water/water_quality_management/305b/2008_final_ct_integratedwqr.pdf

Plans for long term monitoring:

DEP monitoring- Currently WPLR plans on continuing the present level of effort. Targeted monitoring occurs on a rotating basin schedule. The rotation takes 5 years to complete following this sequence; Housatonic major basin, Southwest/South central coastal major basins, Connecticut major basin, Thames major basin, and southeast coastal major basin. The Connecticut major basin was sampled during 2008 and may be the focus again in 2013. In addition to the targeted monitoring WPLR each monitoring focus year has approximately 20 sites selected randomly statewide. It is undetermined how many will fall in the focus area, if any, each year.

Citizen-based monitoring-Several entities have and continue to contribute credible water quality data to WPLR to augment water quality assessments. These include, Farmington River Watershed Association, Salmon Brook Watershed Association, and Simsbury High School. WPLR would like to encourage continuation of these efforts as to date have provided data where and when WPLR have had to focus elsewhere.

USGS- the CT DEP maintains a long-term cooperative monitoring network with USGS. This network includes both water quality monitoring sites and continuous record stream flow gages. The data are critical for long-term trend assessment of water quality and stream flow, especially with regard to monitoring the effects of urbanization and climate change. At a time with the program should be expanding, it is actually in serious jeopardy from funding cuts, especially for stream flow gages.

Baseline water quality data: lower Farmington specifically –

Chemistry- Traditionally WPLR has relied upon the USGS monitoring sites at Unionville, CT and at Tariffville, CT for water quality data in the lower Farmington River. There has been no exceedance of the numeric criteria during the period of record (1999-2007). Tributary data are variable with most site locations meeting numeric criteria (Bunnell Brook, Unionville Brook, Roaring Brook, Thompson Brook, Nod Brook, Hop Brook, and Salmon Brook). One major tributary, the Pequabuck River, often does not meet water quality standards for various heavy metals and is marginal for dissolved oxygen. The Pequabuck River is primarily treated waste water during base flow conditions.

Macroinvertebrates- The lower Farmington River is predominantly a large non wadeable river. As such, current WPLR macroinvertebrate collection and assessment methodologies are not appropriate for this type of habitat. As a result very little data has been collected from this segment of stream. WPLR have 2 long-term stations, one at Unionville and the other at Avon. Data have shown that both sites meet narrative water quality standards for aquatic life use. Tributary data are variable with most meeting narrative criteria (Bunnell Brook, Thompson Brook, Nod Brook, Hop Brook, and Salmon Brook). The Pequabuck River consistently does not meet the criteria. In addition the lower portion of Roaring Brook in Unionville, Rainbow Brook, and Seymour Hollow Brook, both in Windsor Locks do not meet aquatic life use criteria.

Of note are studies commissioned by the US Fish and Wildlife Service to document freshwater mussel populations in the lower Farmington River. In this study, it was reported that the lower Farmington River has extremely high species richness, perhaps the highest in New England. (Nedeau, E.J. 2005. Farmington River Freshwater Mussel Survey. Report submitted to the U.S. Fish and Wildlife Service.)

Fish- Similar to macroinvertebrate data collection methodology, fish community data also is based on wadeable sections of rivers and streams. As a result data has only been collected at a single location at Tariffville, CT. Fish community assessment methods are in the process of being developed. As a result assessments are made with best professional judgment. In general the tributaries sampled have cool water communities dominated by native species and most likely would meet our water quality standards. Exceptional fish communities were found in both Thompson Brook and Salmon Brook (exceptionally high numbers of trout and sculpin). Rainbow Brook and Seymour Hollow Brook, both in Windsor Locks have very poor fish communities and would not meet aquatic life use criteria.

Indicator bacteria- Assessments are based on a combination of USGS data from Unionville and Tariffville gage locations as well as data collected by the Farmington River Watershed Association. Please be aware that these criteria are intended for high-use designated bathing areas and low magnitude exceedance is common in over 80% of state waters.

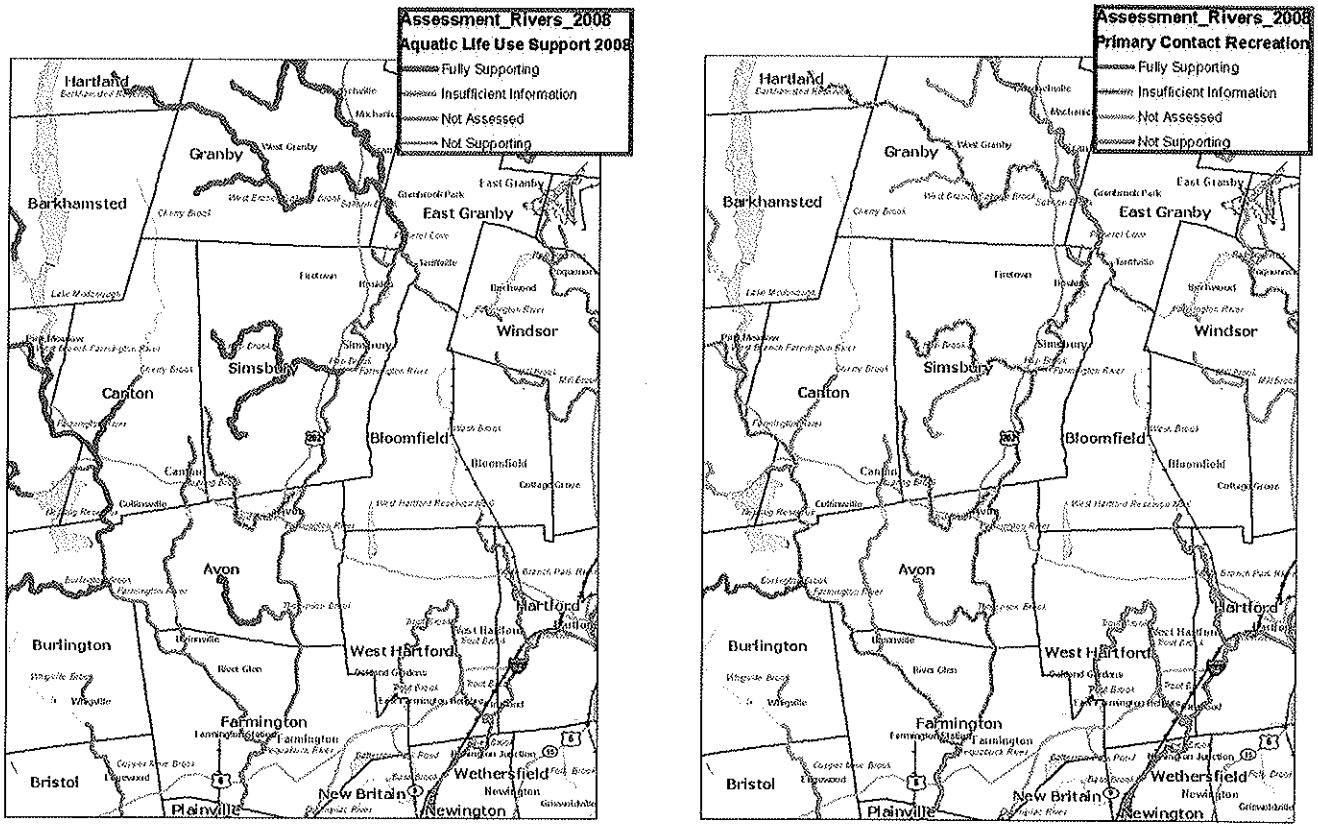

Figure 1. 2008 use support designations for the lower Farmington River and associated tributaries. The figure on the left represents degree of aquatic life use support while the figure on the right represents degree of contact recreation support. Figures are taken from data reported in the 2008 Integrated Water Quality Report.
http://www.ct.gov/dep/lib/dep/water/water_quality_management/305b/2008_final_ct_integratedwqr.pdf

Baseline water quality data: Salmon Brook specifically–

Chemistry- Traditionally WPLR has relied upon its own collection effort for water quality data in Salmon Brook basin. Review of data against water quality standards show no exceedances of numeric criteria. There have been no exceedances of the numeric criteria at mainstem sites or tributary sites during the period of record (1998-2007).

Macroinvertebrates- Data indicate exceptional communities at almost every site sampled within the basin. Samples have high diversity especially in sensitive groups like mayflies, stoneflies and caddisflies. Of note is the presence of the stonefly *Pteronarycs sp.* in almost every sample from every site. *Pteronarycs sp.* is thought to be indicative of high quality steam condition. This basin wide distribution of high quality macroinvertebrate communities is rare in Connecticut. All sites and samples meet aquatic life use support. One exception is a small section of the East Branch of Salmon Brook at the state line. In this area episodic silage leachate and or sediment laden runoff may have isolated negative impact on the macroinvertebrate community.

Fish- Data indicate exceptional coldwater fish communities at almost every site sampled within the basin. Samples have moderate to high abundance of native brook trout, fry stocked brown trout and Atlantic salmon, and slimy sculpin. Of note is the presence of the slimy sculpin in almost every sample from every site. Slimy sculpin are thought to be indicative of very cold, high quality steam condition. This basin wide distribution of high quality fish communities is rare in Connecticut. Based on the number of fry stocked and survival and growth rates from the streams within this basin Salmon Brook is important contribution to the Atlantic salmon restoration effort.

Bacteria- Data exists for several sample collection locations on the East Branch Salmon Brook and West Branch Salmon Brook. Most data were collected by the Farmington River Watershed Association with the exception of one WPLR site that was randomly selected as part of a statewide probabilistic sample design. Data are variable and commonly exceed single sample criteria. As a result the mainstem of Salmon Brook and entire East Branch Salmon Brook and the lower portion of the West Branch Salmon Brook do not support contact recreation use. Please be aware that these criteria are intended for high-use designated bathing areas and low magnitude exceedance is common in over 80% of state waters.

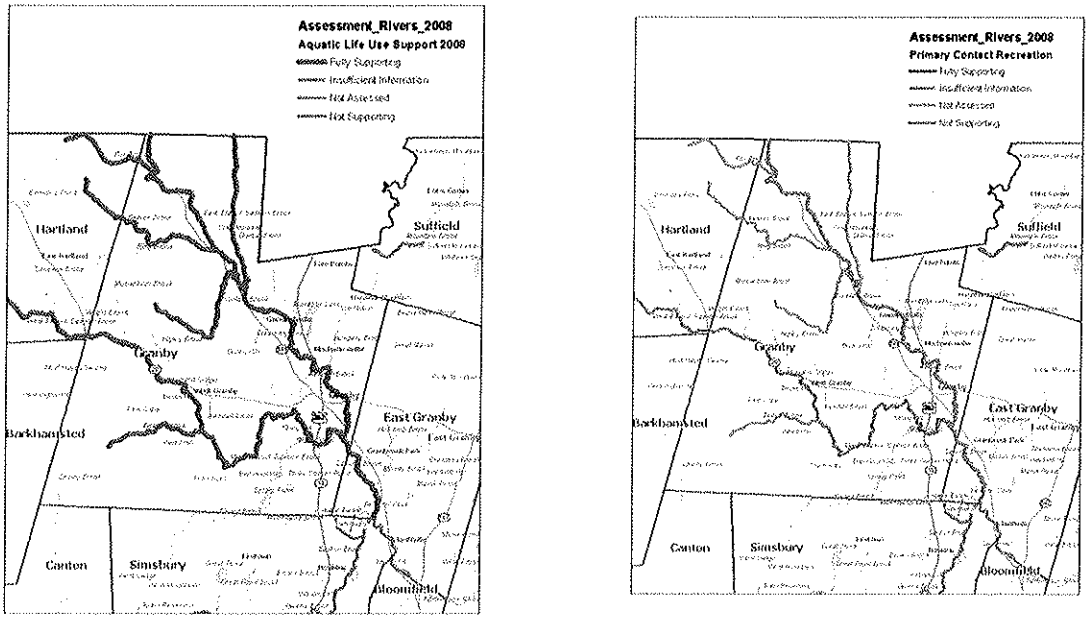

Figure 2. 2008 use support designations for the Salmon Brook regional basin. The figure on the left represents degree of aquatic life use support while the figure on the right represents degree of contact recreation support. Figures are taken from data reported in the 2008 Integrated Water Quality Report.
http://www.ct.gov/dep/lib/dep/water/water_quality_management/305b/2008_final_ct_integratedwqr.pdf

Summary: The lower Farmington River and Salmon Brook watershed especially are characterized by having good chemical water quality which then is reflected in exceptional biological communities- both fish and macroinvertebrate. Furthermore, the notable populations of organisms requiring minimally disturbed environmental conditions like, fresh water mussel species, *Pteronarycs* stoneflies, native brook trout, slimy sculpin, and a variety of migratory fish species, all further confirm the high ecological integrity of this system In order to maintain the existing level of ecological integrity it will be increasingly important to make educated decisions regarding future growth and expansion as well as work towards reducing existing water quality issues.

Please feel free to contact either myself or the monitoring program supervisor at 860-424-3715 or Christopher.Bellucci@ct.gov should you have any questions or concerns regarding information presented in this letter.

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