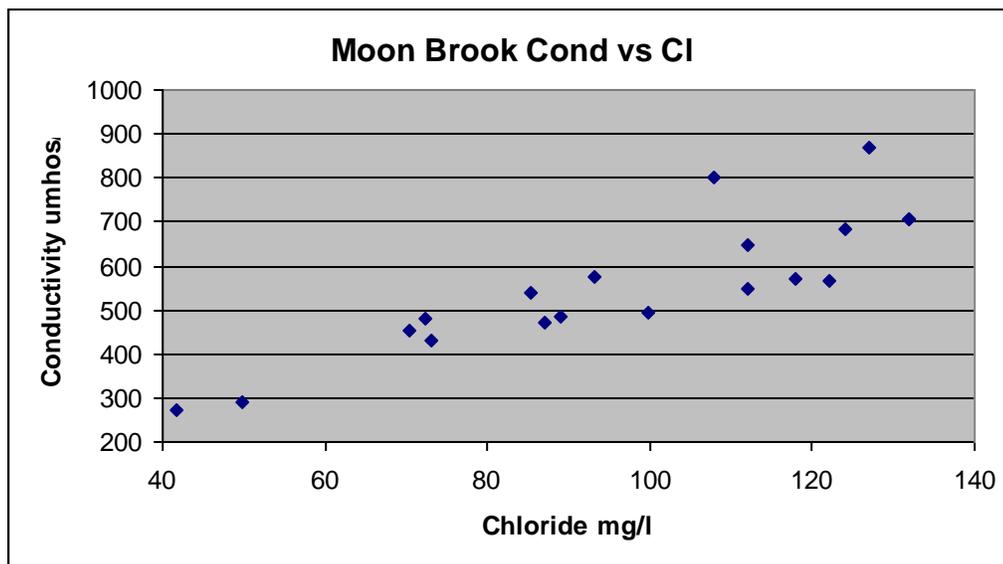


Impairment of Moon Brook is not due to stormwater.

1. Chloride data from Moon Brook indicates significant elevation of chloride above expected background conditions. The chart below shows chloride levels plotted against specific conductance. Chloride concentrations in the lower 1.5 miles of Moon Brook average 111 mg/l with a range of 73-132 mg/l Cl. While these numbers are below concentrations likely to have a significant effect on biological communities (chronic criterion of 230 mg/l indicates concentration at which non-lethal effects may be evident), they are consistent with values found in other stormwater-impaired streams (e.g. Sunderland Brook and Allen Brook) and do indicate at least a moderate level of human disturbance in the watershed.



2. The percent impervious surface, or urbanized area in the watershed, is of a magnitude that suggests stormwater is likely to be a source of disturbance to the chemical, physical and biological condition of Moon Brook. Recent Phase 1 and Phase 2 geomorphic studies of the Moon Brook watershed have identified % urban land use, road density, and stormwater input as significant stressors on the hydrology and sediment load of Moon Brook (Bear Creek Environmental, 2008, River Corridor Plan Moon Brook Watershed). Bear Creek found a strong positive correlation between the percentage of urban land use within the Moon Brook watershed and the impact rating from Phase 1 assessment. The report also notes that stormwater runoff and the influence of Piedmont and Combination Ponds have both altered the hydrology and sediment regime of the watershed.

3. Alleged mis-classification of Moon Brook. There appears to be some confusion regarding the manner in which DEC has assessed macroinvertebrate and fish communities in Moon Brook. Methods for assessing fish and macroinvertebrates are somewhat different in terms of expectations and reference conditions, and are somewhat different from geomorphological assessments as well. I will discuss each separately.

Macroinvertebrates: For the reaches of Moon Brook upstream of Combination Pond, DEC has used the Small High Gradient macroinvertebrate eco-type as the reference type stream. This classification is consistent with the slope, habitat configuration and substrate composition of the model eco-type. Macroinvertebrate communities have consistently met the biocriteria expectations for a SHG stream. For the reaches of Moon Brook downstream of Combination Pond, the Warm Water Medium Gradient eco-type reference model has been applied. DEC has acknowledged the the lower reaches of Moon Brook where it enters into the Otter Creek flood plain transition into a lower gradient configuration that could be called a Slow Winder in the very lowest reaches. This classification is consistent with the classifications applied in the majority of small streams in the Champlain valley which have been assessed by DEC. There is some consideration given to classifying the entire portion of Moon Brook above route 7 as a small high gradient stream, given the desire to restore the stream to cold water habitat capable of supporting brook trout. However, for the macroinvertebrates, the WWMG model seems to be the most attainable goal for Moon Brook. Station 0.3, below Forest Street, has been a point of discussion for some time. At this site there is a section of riffle with significant cobble substrate within a reach that is of relatively low gradient. There is some contention that this substrate is not of natural origin and is an artifact of the Forest Street bridge construction. Macroinvertebrate community expectations are more sensitive to micro-habitat conditions than to overall reach characteristics. In other words, where there is appropriate “riffle/cobble” habitat within a relatively low gradient reach downstream of higher gradient reaches, that habitat can be expected to support a community that is representative of water quality conditions at that site and that the application of biocriteria applicable to that habitat type is appropriate. The City of Rutland has made reasonable arguments regarding the application of WWMG criteria at this site and DEC has acknowledged that argument by applying some best professional judgment taking the City’s considerations into account. Even by lowering expectations somewhat, community condition is still much less than what should potentially be there.