

**Management Suggestions for Charlotte Town Agricultural Fields
in Watershed of Holmes Brook
by Karen Bates, DEC Basin Planner**

The town of Charlotte will be renewing an agricultural lease on the Demeter property fields off Route 7. I was asked by the Charlotte Town Park Oversight committee to visit the property and make recommendations pertaining to the management of land that would benefit the health of a tributary to Holmes Brook. On April 19, 2010, I visited the property with the committee and my recommendations are listed on page 2.

Description of Holmes Brook and Tributary

A tributary to Holmes Brook begins just west of Route 7 on the property and joins Holmes Brook at Greenbush Road (Figures 1 and 2, reaches labeled T3S8 and T3 respectively). The brook continues on to Lake Champlain. Holmes Brook watershed is small, covering only 3.78 square miles. The Demeter property encompasses most of the tributary in question. Land use affecting the condition of the brook includes cropland and roads. The cropland is immediately adjacent to the tributary. The cropland receives surface runoff from Route 7. While the cropland land and, to a lesser degree, roads contribute increased flows and sediment to the brook, the tributary is free of encroachments and has not experienced significant straightening in the past (Lewis Creek Association, 2008). Therefore, any degradation in the condition of the tributary is likely attributable to management practices of adjacent land use.

The geomorphic assessment of the tributary, completed by the Lewis Creek Association, rates the condition from fair at the top to good midway to its confluence with Holmes Brook. The condition of the brook is sensitive to changes, moderately at the top (reach T3S802) and which increases to high sensitivity mid way (reach T3S801). Sensitivity refers to the likelihood that a stream will respond to a watershed or local disturbance or stressor. For example, changes in sediment load or flows due to encroachment or straightening could increase erosion within the channel if the stream has a high sensitivity.

The geomorphic study of the stream (Phase I) has been limited to interpretation of maps and some visual survey during walks of some segments. In addition, I walked the section of the stream running north-south across a hay field and a hundred yards into the woods. It appears that the tributary is undergoing changes in response to land use. One change includes the eroding of the stream bed as the stream leaves the field and enters the forested area. The erosion into the stream bed, or head cut, could continue north as far as the crossing of the Demeter farm road/path. The contributing sediment to the brook could be substantial and could affect the stability of the downstream segments as well as water quality.

Present uses of areas

In the immediate area of the brook, the watershed of the top section of the tributary below Route 7 includes a plowed corn field to the south that is expected to rotate to hay this summer, and hay field to the north (Figure 3). A cattail filled wetland is located between

Route 7 and the plowed cornfield. The wetland most likely extends into the plowed area as the soils appeared hydric (a wetland soil). To the north of the tributary, the Varney farm field drains into a swale that eventually reaches the tributary.

Management of the brook to obtain equilibrium

The tributary contributes to the health of the Holmes Brook, which continues west of Greenbush Road and eventually reaches the shoreline of Lake Champlain immediately south of the Charlotte Beach. Ensuring that the tributary maintains or recovers equilibrium with sediment loads and flows will in the end protect Holmes Brook from further erosion and protect the Charlotte Beach from algal blooms, high turbidity and help in limiting pathogens levels. In addition, reducing the loss of soil from farm fields and implementing nutrient management plan recommendations will reduce phosphorus and pathogen levels in the brook.

Management recommendations

1. Request review of tributary by Gretchen Alexander, state river scientist, to assess head cut and general condition of tributary and determine need to remediate the headcut.

Contact information: Gretchen.Alexander@state.vt.us or 241-3757

2. Reduce runoff from plowed corn field (Figure 3).
 - ❖ Follow rotation schedule between corn and hay. Use buffer strips when land is in corn to reduce erosion of top soil, especially in area that slopes towards the hedgerow.
 - ❖ Maintain hedgerow to help treat surface runoff and reduce loss of soil due to wind erosion
 - ❖ Look for opportunities on west side of Route 7 to reduce runoff that culverted under Route 7.
3. General recommendations for town leased agricultural land in watershed:
 - ❖ Encourage farmer to pursue USDA incentives for cover cropping, minimal tillage, filter and buffer strips to reduce loss of top soil, increase infiltration of stormwater and reduce input of pollutants to Holmes Brook. Danny Peet, NRCS, is available and willing to discuss with town and farmer programs applicable to the town's fields and open to the farmer.
 - ❖ Discuss eligibility of hay fields for conservation programs to protect grassland bird habitat (see attached)

Contact information: Danny Peet, at Danny.Peet@vt.usda.gov or 865-7895 ext. 202.

4. Increase woody vegetation (shrubs and/or trees) adjacent to tributary in hay field. A 50-foot buffer is recommended. Would also need to consider an invasive

species management plan. USFWS Partners for Wildlife would be able to provide technical assistance and possibly financial assistance.
Contact information: Frank Pendleton: frank_pendleton@fws.gov or 872-0629 ext.
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Figure 1 Northern study area of Lewis Creek Association geomorphic assessment of direct tributaries to Lake Champlain (Lewis Creek Association, 2007).

Figure 2. Subwatersheds of stream segments (Lewis Creek Association, 2007)

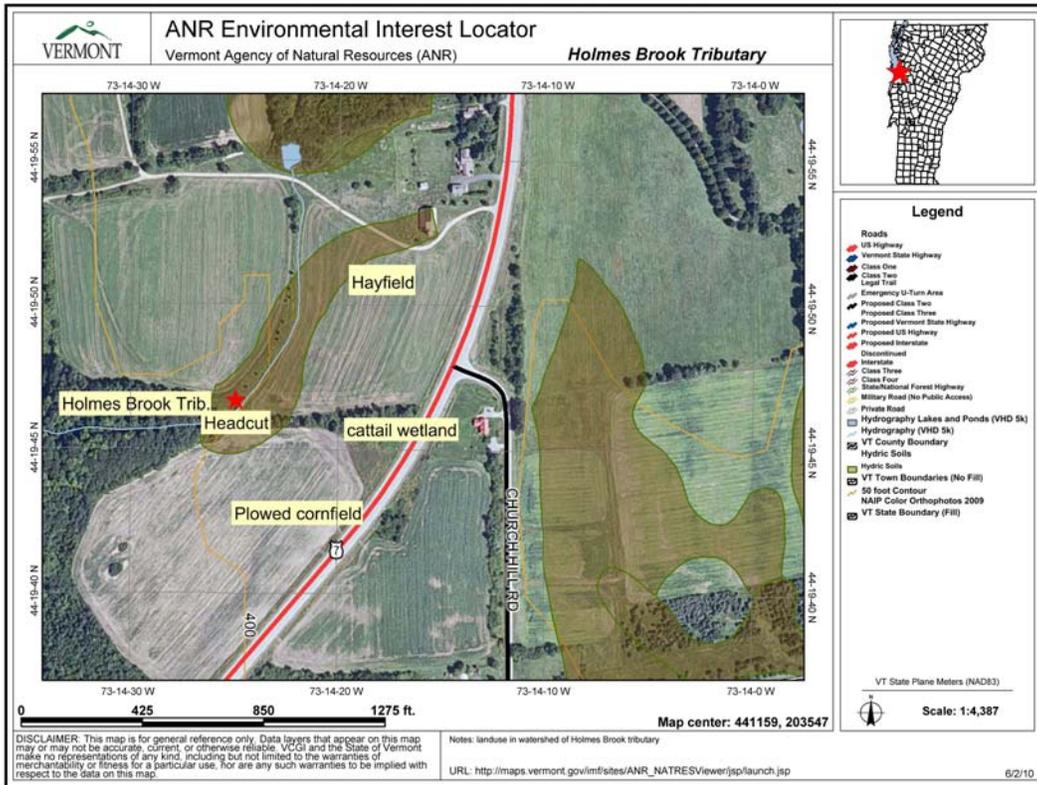


Figure 3. Corn field and hay field at head of tributary

References:

“Phase 1 & 2 Geomorphic Assessment Report: Direct Drain to Lake Champlain in Shelburne and Charlotte” Prepared by Lewis Creek Association, February 2008