the more agricultural and urban ecoregions to the north and west and the more mountainous and forested ecoregions to the south and east. The geology of these areas consists mainly of sandstone and shale (*www.newyork.geology-forum.com*).

Recreational opportunities are abundant in the Cohocton River Watershed, with Lamoka and Waneta Lakes and the Cohocton River providing for many outdoor activities. NYSDEC maintains numerous public fishing areas along the entire extent of the river. Information on the location of these access areas, as well as fishing regulations for these areas, can be found under Region 8, Steuben County at *http://www.dec.ny.gov/outdoor/9924.html.*

The Cohocton River also provides opportunities for canoeing and kayaking, especially on the lower reaches and onto the Chemung River. There are three specific launches for canoes and kayaks: along Route 11 in the Town of Bath (sampling site COHO 16.5), at Wood Road in the Town of Campbell (sampling site COHO 9.7), and at Kinsella Park in the Town of Erwin (sampling site COHO 0.5). The Chemung Basin River Trail Partnership is an active organization in the area and was formed in 1999 to promote protection of the Chemung basin, including the Cohocton River Watershed. For more information on this group or to sign up for its newsletter, please see the partnership's web site at *http://www.chemungrivertrail.com.*

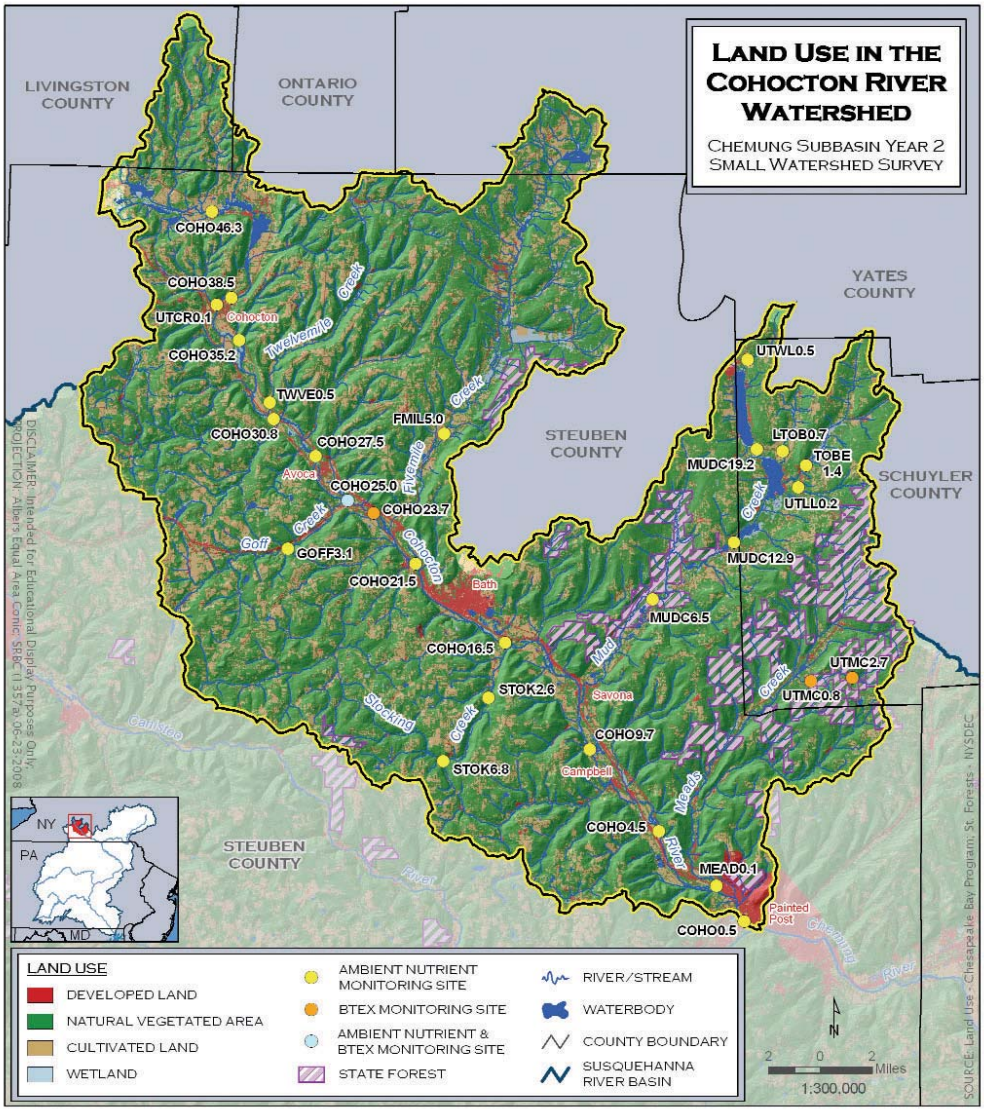

Figure 2. *Land Use in the Cohocton River Watershed*

METHODS

DATA COLLECTION

Between April 2007 and February 2008, SRBC staff collected quarterly water chemistry samples and measured stream discharge at 25 stream sites in the Cohocton River Watershed. Macroinvertebrate samples were collected, and habitat assessments were completed at each site in June 2007. Appendix A contains a list of station names, sampling location descriptions, drainage areas, and latitude and longitude coordinates for each of these sites. In addition, volatile organic samples were collected at one of the original 25 sites as well as three additional locations. These additional sites were located upstream and downstream of large automobile salvage yards and are listed in red in Appendix A. The site listed in blue was sampled for both volatile organics and nutrient parameters.

The sampling sites were selected so SRBC staff could collect biological, water quality, and habitat data from specific stream and river segments, as well as major tributaries, primarily to assess nutrient impacts. Water quality samples were collected in April 2007, July 2007, October 2007, and February 2008, and analyzed for field and laboratory parameters. Water was collected using a hand-held, depth-integrated sampler at six verticals across the stream channel. At locations that were not wadeable, a depth-integrated bridge sampler was used. The water was put into a churn splitter, mixed thoroughly, and split into two 500-ml bottles, one fixed with sulfuric acid for nutrients, two 125-ml bottles, one filtered, and both fixed with nitric acid for metals, and two amber pre-fixed vials for total organic carbon (TOC). Staff collected duplicate samples for lab chemistry once per day to meet quality assurance standards.

Additionally, staff collected two bottles, one fixed with nitric acid for additional analysis using a spectrophotometer. A glass sediment bottle also was filled for a suspended sediment sample at each site. These two analyses were completed in the SRBC laboratory.

Staff used the remaining water to complete field chemistry analysis. Temperature was measured in degrees Celsius with a field thermometer. A Cole-Parmer Model 5996 meter was used to measure pH. Conductivity was measured with a Cole-Parmer 1481 meter, and dissolved oxygen was measured with a YSI 55 meter. Turbidity also was measured in the field with a Hach 2100P portable turbidometer.

Cohocton River south of Bath, N.Y.

Stream discharge was measured, when wading was possible, using a Scientific Instruments pygmy or AA meter, or a FlowTracker according to United States Geological Survey (USGS) methods (Buchanan and Somers, 1969). Three sites were located at USGS gage sites, where the discharge for the time of sampling was obtained from the appropriate USGS web site. During the February sampling round, no discharge measurements were taken due to ice.

In June 2007, staff sampled for benthic macroinvertebrates (organisms that live on the stream bottom, including aquatic insects, crayfish, clams, snails, and worms) at 22 locations in the Cohocton River Watershed, using a modified version of Rapid Bioassessment Protocol (RBP) III (Barbour and others, 1999). Two kick screen samples were taken at each station by disturbing the substrate of representative riffle/run areas and collecting the dislodged material with a one-meter-square 600-micron mesh screen. Each sample was preserved in 95 percent denatured ethyl alcohol and returned to SRBC's lab. A 200-count subsample was picked for each sample, and organisms were identified to genus (when possible), except for midges and aquatic worms, which were identified to family. Duplicate macroinvertebrate samples were completed at 10 percent of the sites for quality assurance purposes.

Physical habitat conditions were assessed using a modified version of RBP III (Plafkin and others, 1989; Barbour and others, 1999). Staff evaluated stream sites based on physical characteristics relating to pool and riffle composition, substrate, conditions of banks, and the extent of riparian zone. Each habitat parameter was assessed on a scale of 0-20, with 20 being optimal; all parameter scores were added together to generate the total habitat score for each site. Other field observations also were recorded regarding weather, land use, substrate composition, and any other relevant watershed features.

Volatile organic/BTEX samples were collected by hand directly from the stream. Water was poured carefully into an amber 40-ml vial so as to minimize aeration and volatilization. The sample was preserved with 1:1 HCl to a pH of between 1 and 2. Two vials were collected at each site and were wrapped together in a 500-ml wide-mouth Nalgene bottle and placed immediately on ice. For quality assurance, a blank sample was completed using organic free de-ionized water once during each sampling round.

Staff could not conduct storm sampling as planned due to insufficient rainfall during the periods of interest. A few samples were taken in April 2008 during a small storm that covered only the lower half of the watershed. For these samples, water was collected using a depth-integrated bridge sampler, placed into a churn splitter, mixed thoroughly and split into three 500-ml bottles, one 125-ml bottle, two vials for TOC, and one glass sediment bottle. The remainder of the water was used for field chemistry, including temperature, dissolved oxygen, conductivity, pH, and turbidity.

DATA ANALYSIS

Water quality was assessed by examining field and laboratory parameters that included nutrients and major ions (Table 1). Staff compared the data collected to water chemistry levels of concern based on current state and federal regulations, background levels of stream chemistry, or references for approximate tolerances for aquatic life (Table 2). The difference between the yearly average value for each parameter was calculated for each site. If the value did exceed the level of concern, the difference was listed; if not, then the site was given a score of zero. For each location, the sum of all the exceeded values was calculated and averaged by the number of parameters. Sites with a water quality score between 0-0.25 were classified as "higher" quality. Sites between 0.26-0.75 were classified as "middle" quality, and sites with a score greater then 0.75 were ranked as "lower" quality. For the water quality calculations, an average for each parameter at each location was used. Any seasonal trends also were noted and will be discussed in the results section. Table 3 lists all the parameters that were analyzed with the volatile organics sampling.

Staff analyzed benthic macroinvertebrate samples using six metrics: (1) taxonomic richness; (2) modified Hilsenhoff Biotic Index; (3) percent Ephemeroptera; (4) number of Ephemeroptera/Plecoptera/Trichoptera (EPT) taxa; (5) percent Chironomidae; and (6) Shannon-Wiener Diversity Index (Table 4). Three reference categories were developed for the macroinvertebrate data analysis: mainstem Cohocton River, tributaries with a drainage area of greater than 20 square miles, and tributaries with a drainage area less than 20 square miles. The metric scores for each site were compared to the reference scores, and a biological condition category was assigned based on RBP III methods (Plafkin and others, 1989; Barbour and others, 1999). The same reference sites were used in the analysis for the habitat scores. The ratings for each habitat