

The pages in this document were taken from the "Millers Creek Watershed Improvement Plan" published in April 2004. The entire document can be found at <http://www.aamillerscreek.org/Findings.htm>.

# Millers Creek Watershed Improvement Plan

## **Excerpt Showing an Example of a Monitoring Component**

**April 2004**

#### **8.4 MONITORING AND ADAPTIVE MANAGEMENT**

The Millers Creek Improvement Plan is a working document that is intended to guide the improvement of Millers Creek and the Huron River. Due to the complexity of natural systems and urban landscapes, it is difficult to fully understand functional relationships between public administration, land use practices, weather, infrastructure, pollution sources, water quality, human behavior, hydrology, and other aspects of watershed management. It is expected that the implementation process will reveal new information, deeper understanding, and practical realities that can be used to improve the plan. An adaptive management approach is recommended for implementation of the Millers Creek Improvement Plan to facilitate the process of discovery, effective decision-making, and plan updates. Adaptive Management is the process of acting and then responding to the results of actions with informed decision-making. Adaptive management dictates, to varying degrees, the course and nature of future actions through a process of learning from previous actions.

An effective adaptive management program requires input from continuous monitoring to assess the effectiveness of implementation activities. The following monitoring activities are recommended to assess the effectiveness of the Millers Creek Improvement Plan. **Table 8.2** summarizes the recommended monitoring plan and proposed costs. The recommended monitoring activities have been selected to specifically measure the attainment of the plan's identified goals. As such, they are presented below in relation to the goal they are intended to assess.

#### **1) Watershed Land Use and Management**

The watershed land use and management goal has a stated objective that emphasizes stewardship through various resource protection and management activities. The qualitative nature of this objective calls for a qualitative monitoring approach that is consistent with typical Phase I and II storm water reporting. Monitoring watershed land use and management practices will be modeled after, and in some cases integrated with, the Middle Huron Initiative. Activities and related costs will be tracked and reported.

#### **2) Hydrology**

To meet the hydrology goals, the plan has a stated objective of reducing peak flows by approximately 50% for the bankfull storm event. We define the bankfull event at approximately the 1-year to 2-year design recurrence interval storm event. To assess the attainment of this objective, HRWC should maintain two transducers (at the Plymouth and Glazier sites) to collect continuous (10-minute intervals) flow data throughout the ten-year implementation schedule (years 1,4,5,9 and 10). HRWC should recreate the rating curves at a minimum of four of the flow study sites during the 10-year implementation period. HRWC should also repeat the geomorphology (channel shape) measurement once for each of the 5 study sites. Measuring the channel shape will allow HRWC to determine the areas and extent of bank erosion and channel adjustment. Collected rain data from either the Pfizer and/or the UM rain gage should be compiled annually as well.

#### **3) Water Quality**

The water quality goal of the plan has two stated objectives: decrease phosphorus loading by 50% from existing conditions and reduce *E. coli* numbers in surface waters to the state WQS of 130/100 ml (per Huron River phosphorus and *E. coli* TMDLs). Attainment of these regulatory requirements will be assessed by conducting periodic water quality sampling, but water quality improvements will take time to accrue. Water quality sampling should be conducted once every five years during the ten-year implementation schedule at the stations used during the Millers Creek study. Sampling shall be conducted between April 1 and November 1 during both wet and dry weather events to evaluate illicit connections and storm water related sources of phosphorus and *E. coli*.

#### **4) Fish and Wildlife Habitat**

The objective of the fish and wildlife goal is to improve the habitat and biological integrity of Millers Creek. To assess this objective, HRWC should continue to monitor three sites annually during the 10-year period. Monitoring will rotate between eight sites to allow the flexibility to monitor sites near where improvements are being made and to build on existing data, without monitoring every study site every year. In-stream habitat should be assessed between one and two times during the ten-year implementation schedule.