Chapter 8 METHODS TO MEASURE PROGRESS

The five long-term goals established to protect and restore water uses of the river in the Upper Subwatershed are ambitious and may take several decades to accomplish. However, significant progress can be made over the next five years. Short-term objectives identify the progress that can be reasonably expected if the action plan is fully implemented by the cooperating public agencies, private organizations, businesses, and residents. At the end of 2004, there should be sufficient information available to document whether or not the short-term objectives have been met and what additional actions are needed to assure continuing progress toward meeting the long-term goals.

The following measures are proposed to evaluate how effective the proposed actions have been in achieving the short-term objectives. Where possible, the measures focus on quantifiable improvements documented by direct sampling of the river. If direct sampling is not likely to result in quantifiable changes within the next five years, or the cost of adequate sampling is prohibitive, alternatives are proposed. Where studies or investigations are needed to evaluate alternatives or develop information, the measure is simply a determination of whether or not the proposed action has been completed on schedule. The measures are intended to help define how progress is being made toward achieving the goals.

8.1 Protect Public Health

The short-term objectives for protecting the health of people who use or come in contact with the river focus on removing sources of untreated human sanitary waste reaching the river. Michigan water quality standards establish a method for measuring specific indicator bacteria (*E. coli*) to protect partial-body and total-body contact recreation. Actions are proposed in the next four years to remove sources of untreated waste that threaten public health during dry weather conditions, when most water-related recreational activities occur. The success of these efforts can be directly measured.

Progress Measures – Protect Public Health

- By 2003, the Upper SWAG members will cooperate in conducting indicator bacteria sampling during dry weather conditions at key locations in the Upper Rouge River to determine whether or not sources of untreated human waste have been effectively reduced through control of illicit connections and failing OSDS.
- By 2004, the Upper SWAG members will propose any new initiatives needed to control both sanitary waste discharges and potential sources of animal waste being discharged to the river, if measures to control sources of untreated human waste have not resulted in satisfactory reductions in bacteria levels.

Within five years, sources of human waste entering the river during wet weather conditions from the remaining CSOs or SSOs may not be fully controlled. The short-term objective is to have the final design and construction schedule in place to address all remaining untreated CSOs and identify any remedial actions that may be required to address SSOs. The achievement of these short-term actions to address wet weather sources of untreated sanitary waste can be documented under the following measure.

Progress Measure – Control of CSOs and SSOs

By 2005, the Upper SWAG members with legal responsibilities for collecting and transporting sanitary waste will be in compliance with corrective programs and schedules required by state-issued permits or orders regulating CSO and SSO discharges to the river.

8.2 Reduce Excessive Flows

The most difficult challenge in the Upper Subwatershed is controlling the storm water flows following wet weather events, which cause extensive damage to property and aquatic habitat. Most of the short-term actions are focused on stopping or reducing the trend of increasing frequency, volume, and velocity of flood flows in the river. Concurrently, communities and agencies will be assessing the most cost-effective approaches to reducing runoff from portions of the subwatershed already developed. Baseline historical data on the wet weather flows in the river are available and future direct measurement of flows following storm events can be used to assess progress.

Progress Measure – Reduced Storm Water Runoff from New Developments

- From 2001 through 2005, the Upper SWAG members will maintain flow data from locations already established within the Upper Subwatershed and add new flow monitoring locations, if required, to measure progress toward achieving short-term objectives.
- From 2001 through 2005, the Upper SWAG members will cooperate in collecting and analyzing storm water flow data to determine whether or not proposed actions have stopped or reduced the trend of increasing frequency, volume, and velocity of flood flows caused by new development.

The wetlands and flood plains in the Upper Rouge River Subwatershed provide critical storage capacity that mitigates the effect of rapid runoff on downstream areas subject to flooding and erosion. Protecting these natural areas from inappropriate use is essential if current trends in increasing river flows are to be reversed. State law regulates the use of wetlands and the occupation of flood plains. The location and quantity of wetlands and unoccupied flood plains within the Upper Subwatershed that serve to mitigate the affects of upland storm water flows need to be identified so that the success of regulatory programs designed to protect the essential flood storage functions of areas can be measured.

Progress Measure – Enhanced Protection of Flood Plains and Wetlands

- By 2004, the MDEQ will establish a baseline inventory of wetlands within the Upper Rouge River Subwatershed that serves to mitigate the affects of upland storm water flows on the river.
- By 2005, the MDEQ will establish a method to evaluate the effectiveness of state regulatory programs designed to protect the natural water storage capacity of flood plain areas.

13. Protecting Wetland Areas

Wetland area providing water storage, wildlife habitat, and water quality protection
Headwaters, Upper Rouge River, Commerce Township. (Photo provided by Commerce Township.)

To achieve the long-range goal to *reduce* excessive flows, alternatives for expanding the capacity of current storm water detention facilities or constructing regional detention facilities in the developed portions of the watershed need to be considered. Two studies provide critical first steps in evaluating alternatives to mitigate existing flow problems. Completion of these initial efforts will help measure progress toward reducing flood flows.

Progress Measures – Enhanced Storm Water Management in Developed Areas

- By 2003, the City of Livonia will complete its pilot study to determine the cost and effectiveness of off-channel regional storm water detention facilities.
- By 2003, the City of Farmington Hills will complete its assessment of maintenance funding alternatives to ensure that existing detention facilities achieve original design standards for retention of storm water.

While the sources of excessive flows are being addressed over the long-term, the damage being caused on certain properties along the river requires immediate attention. Emergency removal of obstructions, stream bank stabilization, and other actions have been proposed to address current problems. These efforts will not address the long-term sources of excessive flows, but they will attempt to mitigate damages while long-term solutions are being investigated.

Progress Measures – Mitigate Excessive Flow Damage

- By 2003, the Upper SWAG members will complete studies of alternative institutional arrangements to provide authority for public agencies to remove specific fallen trees and other flow obstructions.

8.3 Protect and Restore River Ecosystem for Fish and Wildlife

One specific measurable parameter, dissolved oxygen, is perhaps the best means of easily determining whether or not water quality within the Upper Subwatershed will support desirable, pollution-intolerant species of fish and fish food organisms.

Progress Measure – Achieve Dissolved Oxygen Standard

> By 2003, the Upper SWAG members will cooperate in measuring dissolved oxygen levels at key locations during selected 24 hour periods from June through September to determine whether or not pollution prevention activities have been effective in achieving the water quality standard to protect warmwater fish (i.e., a minimum of 5.0 milligrams of dissolved oxygen per liter)

MDEQ conducts biological surveys of the river once every five years. The information collected in these surveys can help determine whether or not additional steps need to be taken to control suspected sources of pollution that may be the affecting river.

Progress Measure – Protect Biological Community

> By 2005, the MDEQ will conduct a reassessment of the biological community in the Upper Rouge River and assist communities and agencies in the evaluation of results to determine if additional pollution prevention activities are warranted.

Public education programs designed to eliminate illegal dumping of waste into storm drains, minimize residential car washing with high phosphorus detergents, and reduce the use of chemicals on lawns and gardens can be effective means of controlling contaminants and nutrients reaching the river. In addition, providing information and guidance to businesses and public agencies on the storage, handling, and use of polluting materials can reduce potential sources of pollutants to the river. Maintaining current publicly supported household hazardous waste disposal programs is important for preventing inappropriate disposal practices. The effectiveness of current and planned information programs can be evaluated as part of the survey measure proposed in the next section.

8.4 Restore and Maintain Aesthetically Appealing Conditions

The reduction in litter and trash within and adjacent to the Upper Rouge River will be largely dependent upon increasing the sense of stewardship by the residents of the area. Increasing public awareness of the value of the river, creating a sense of ownership, and engaging the residents in projects designed to protect and enhance beneficial uses of the river can help achieve the long-term goal. The measure of success for public education actions will be the level of public knowledge and understanding of (a) how certain attributes of the river support various uses and (b) what individuals can do to protect fish and wildlife habitat and prevent pollution.

Progress Measures – Effective Public Education and River Stewardship

- By 2004, the Upper SWAG members will cooperate with other Rouge River subwatershed groups to survey residents and evaluate the effectiveness of programs designed to increase public awareness and stewardship of the river.
- By 2005, the Upper SWAG members will modify existing public education and involvement activities based upon the survey results to most effectively encourage stewardship of the river.

The annual Rouge Rescue Days event, supported by Friends of the Rouge in partnership with local communities and businesses, has resulted in literally thousands of tons of trash being removed from the

river and its banks. There is anecdotal evidence that the amount of actual litter and trash removed from the river during this annual event, which is held throughout the watershed, is decreasing. However, the best measure of whether or not programs to reduce litter and waste disposal in the river corridor are working may be a survey of riparian property owners.

Progress Measure – Improve Aesthetics

> By 2003, the Upper SWAG members will cooperate with other Rouge River subwatershed groups to identify and survey selected riparian property owners and determine whether or not perceptions of aesthetic conditions have improved as a result of actions taken to build community support for stewardship of the river.

8.5 Minimize Upland Soil Erosion and Related Sedimentation

Pilot Studies now under way within the Upper Subwatershed and elsewhere are expected to provide guidance to local agencies responsible for road cleaning, catch basin maintenance, and related activities designed to reduce materials from reaching the storm water system and eventually the river. Following the completion of these studies, the number of communities applying the information on best management practices for road cleaning and catch basin management can be used as a measure of the effectiveness in reducing this source of sediments to the river.

Progress Measure – Enhanced Control of Pollutants from Roadways

> By 2003, the Upper SWAG members will conduct a survey to determine how the results of current studies on the frequency of road sweeping and catch basin maintenance have been used to implement best management practices in the subwatershed and prevent sediments from entering the river.

One of the major impediments to effective soil erosion prevention has been the lack of technical information and training for local administrators of the permitting programs. An indirect measure of the effectiveness of the program is the number of local program administrators that have been provided state-sponsored certification training.

Progress Measure – Enhanced Control of Soil Erosion and Sedimentation

> By 2003, the Upper SWAG members will prepare a summary report of the number and hours of technical training provided to local officials administering soil erosion control activities in the subwatershed.

Agencies with delegated authority from MDEQ to locally administer state soil erosion and sedimentation permits are required to file annual reports. These reports can be accessed by the public to determine the number of permit violations that have occurred within a local jurisdiction and the corrective actions that were taken.

8.6 Summary of Progress Measures

Exhibit 23 summarizes the activities that will be used to measure progress in meeting the Upper Subwatershed's short-term objectives over the next five years. The progress measures relate directly to the goals. Exhibit 23 also identifies the entity responsible for completing each activity as well as the schedule for completion.

The measures include

- in-stream monitoring, sampling and analyses (bacteria, dissolved oxygen, and flows);
- baseline inventories and assessments (flood plains, wetlands, and related regulations);
- implementation status of BMP pilot studies (regional retention basins, street and catch basin cleaning);
- surveys of residents and riparian property owners (public information and perceptions of river aesthetics); and
- reports on financing, institutional arrangements, and training (storm water detention, channel maintenance, and soil erosion control).

The direct in-stream monitoring of bacteria and dissolved oxygen is scheduled to coincide with the completion of programs to detect and eliminate illicit connections. Flow monitoring, on the other hand, needs to be done on a continuous basis to maintain the seven-year moving averages used to measure flow trends. All the measures are scheduled for completion in time to assist in updating the *Upper Rouge River Subwatershed Management Plan* in 2004.

EXHIBIT 23

Summary of Progress Measures

Progress Measure	Responsible Agency	Year 2001	2002	2003	2004	2005
Protect Public Health						
Bacteria Sampling	SWAG			■		
New Initiatives	SWAG				■	
CSO & SSO Compliance	SWAG					■
Reduce Excessive Flows						
Maintain Flow Data	SWAG	■	■	■	■	■
Analyze Flow Data	SWAG		■	■	■	■
Inventory Flood Plains and Wetlands	MDEQ				■	
Evaluate Regulations	MDEQ					■
Off-Channel Storage	Livonia			■		
Financing Options for Existing Basins	Farmington Hills			■		
Financing/Institution for Channel Maintenance	Wayne County			■		
Enhance River Ecosystem						
Dissolved Oxygen Monitoring	SWAG			■		
Monitor Biological Communities	MDEQ					■
Restore Aesthetics						
Evaluate Public Information & Education Programs	SWAG				■	
Modify Information & Education Programs	SWAG					■
Riparian Survey/Aesthetics	SWAG			■		
Minimize Erosion						
Application of Best Mgmt. Practices Street & Catch Basin Cleaning	SWAG			■		
Report on Technical Training on Erosion & Sediment Control	SWAG			■		

SOURCE: Rouge Project Office, 2000.