

Appendices



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Appendix A

Introduction

Seven Subwatershed Management Plans were developed as part of a comprehensive effort to restore the uses of the Rouge River impaired by pollution and excessive river flows. The purpose of these plans is to mitigate the adverse effects of pollution caused by wet weather discharges (e.g., combined sewer overflows (CSO), sanitary sewer overflows (SSO), and stormwater) as well as the effects associated with dry weather conditions (e.g., illicit discharges to separate storm sewers). The plans also outline the steps needed to control and reduce the adverse affects of excessive river flows that impair fish and wildlife values and injure riparian property. This summary will provide an overview of the information detailed in the seven Rouge River Subwatershed Management Plans developed as a requirement of the Michigan Department of Environmental Quality (MDEQ) Voluntary General Storm Water Permit (MIG610000).

The problems and opportunities for protecting and restoring the Rouge River vary from one subwatershed to another, depending upon the type and intensity of urbanization, the age of the communities, and the design and function of storm and sanitary sewer infrastructure developed over the past 100 years. The seven subwatersheds that were identified to address Rouge River impairments are based upon hydrologic boundaries, so the political boundaries of many communities overlap two or more subwatersheds. While the subwatersheds tend to aggregate communities that have common issues, differences between communities and agencies even within a single subwatershed often require different management practices to meet water management goals.

The watershed approach to management of the Rouge River is unique in that it allows maximum flexibility for regulated communities and agencies to participate in an integrated effort to protect and restore the river. The long-term goals (i.e., greater than five years) established in each of the subwatershed plans will take many years to achieve. Actions are identified, however, to meet short-term objectives (i.e., less than five years) that will be steps toward meeting long-term goals. The approach periodically will measure success toward achieving these long-range goals and modify future actions based upon the progress made.

State of the Watershed

The Rouge River watershed encompasses a diverse geographic area that is home to 1.5 million people living in 48 communities and three counties, as shown in Figure 1. It includes portions of urban core cities, older suburban communities, and rapidly developing rural areas of southeast Michigan. Table 1 summarizes several political and hydrologic characteristics for each subwatershed.

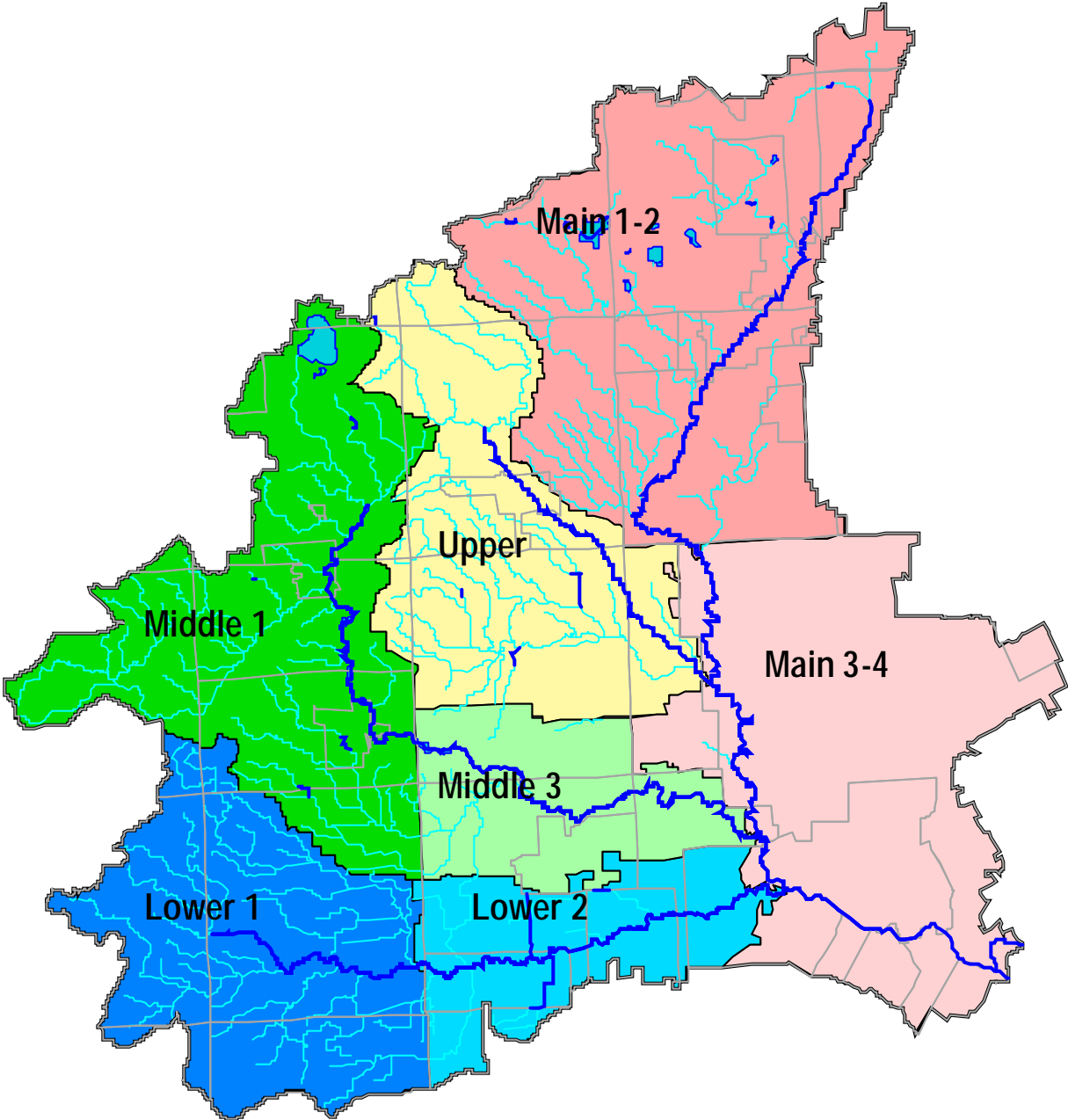
Extensive monitoring within the Rouge River watershed has been conducted, encompassing numerous measures of stream and ecosystem health. Monitoring conducted includes:

- Bacteria
- Oxygen Demand
- Nutrients
- Solids
- Metals
- Toxic contaminants in sediments and water
- Rainfall
- Water and stream levels and flows
- Algae
- Fish and wildlife habitat
- Fish and Benthic Macroinvertebrates
- Aesthetic indices

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Urbanization has created unstable flow conditions throughout the Rouge River watershed. In fact, the primary source of flow in the Rouge River is now surface water runoff. Highly fluctuating flows are common, and in general, the frequency and magnitude of flood flows in the watershed have increased with increased urbanization and associated impermeability of the watershed.

Figure 1 - Rouge Subwatersheds



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Table 1: Summary of Subwatershed Characteristics

Subwatershed	Number of Counties	Number of Communities	Population ¹	Drainage Area (mi ²)	Percent of the Watershed as Impervious Area
Upper	2	8	177,000	91	21%
Middle 1	3	13	94,000	81	17%
Middle 3	1	4	125,000	32	29%
Lower 1	2	6	58,000	62	N.A. ²
Lower 2	1	7	134,000	33	32%
Main 1-2	1	18	215,000	103	N.A. ³
Main 3-4	1	8	593,000	91	N.A. ⁴

¹Population based on 1990 census.

²Not Available: Value not reported in the Lower 1 Subwatershed Management Plan.

³Not Available: Value not reported in the Main 1-2 Subwatershed Management Plan. (66% of land use is identified as residential.)

⁴Not Available: Value not reported in the Main 3-4 Subwatershed Management Plan. (56% of land use is identified as residential, 30% industrial.)

Water quality is highly variable within the Rouge Watershed. In the areas that contain them, CSOs have significantly degraded water quality. In general, the measured water quality parameters (i.e., dissolved oxygen, metals, bacteria, nutrients, and suspended solids) indicate much poorer water quality downstream of the CSO discharges. Approximately 38 of the 127 miles (30%) of the larger streams and tributaries of the Rouge are currently impacted by CSOs. However, significant water quality improvements have been achieved through the control of 40% of the original CSO areas. While water quality improves in areas not impacted by CSOs, bacteria and dissolved oxygen levels still do not meet Michigan water quality standards in many areas. Illicit connections (i.e., illegal or unintentional connection of waste drains into separate stormwater systems), possible separate sanitary sewers overflows (SSOs), and failing septic systems are suspected sources of pollution in the areas upstream of the CSOs.

Habitat quality and fish sampling in the Rouge River watershed indicate that highly variable flows and poor water quality have caused adverse impacts for aquatic species in most areas. A RPO aquatic habitat quality in 1996 found that more than half of all sites monitored had fair or poor conditions. Excellent habitat conditions were observed in the Middle 1 subwatershed only. A 1995 Michigan Department of Natural Resources (MDNR) Fisheries Division survey indicated that pollution intolerant fish species were found in less than 50% of sites monitored in each subwatershed.

Existing Pollution Sources

In order to reach goals on a subwatershed basis, it is important to identify the pollutants or threats that are detrimental to designated and desired uses. Flow variability, excessive sediment and nutrient loading, bacteria, toxics and heavy metals, increase in temperature and loss of natural features were all identified as threats to river quality. Table 2 lists sources and causes of river quality threats identified for each Rouge subwatershed.

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Table 2: Sources of Pollutants in the Rouge River

Threats to River Quality	Sources Identified by Each Subwatershed	Upper	Middle 1	Middle 3	Lower 1	Lower 2	Main 1-2	Main 3-4
Flow Variability	Urban stormwater	√	√	√	√	√	√	√
	Groundwater			√				
Sediment	Construction sites	√	√	√	√	√	√	√
	Roads/streets/highways		√	√	√	√	√	√
	Eroding stream banks and/or bed scour		√	√	√	√	√	√
	Agricultural land		√		√	√	√	√
	Livestock in streams		√	√	√	√	√	√
	Urban stormwater	√		√				
Nutrients	Residential lawns	√	√	√	√	√	√	√
	Failing septic systems		√	√	√	√	√	√
	Illegal discharges to the storm sewer		√	√	√	√	√	√
	Golf courses		√	√	√	√	√	√
	Streets		√	√	√	√	√	√
	Agricultural fertilizers and livestock waste		√		√	√	√	√
	Waterfowl and pet waste		√	√	√	√	√	√
	Combined Sewer Overflows	√		√				
	Sanitary Sewer Overflows	√		√				
Bacteria	Failing Septic Systems	√	√	√	√	√	√	√
	Illegal Discharges to the Storm Sewer	√	√	√	√	√	√	√
	Combined Sewer Overflows	√		√		√		√
	Sanitary Sewer Overflows	√		√		√	√	√
	Pet and waterfowl waste		√	√	√			
	Livestock wastes		√		√			
Toxics/Heavy Metals	Atmospheric deposition		√		√	√	√	√
	Construction materials		√		√	√	√	√
	Street/roads/highway runoff	√	√	√	√	√	√	√
	Household Hazardous Waste	√	√		√	√	√	√
	Combined Sewer Overflows			√				
	Sanitary Sewer Overflows			√				
	Deicing of roads	√		√				
	Landfill leachate			√				
	Runoff from polluted areas			√				
Illegal Discharges to the Storm Sewer			√					
Temperature increase	Impervious surfaces		√		√	√	√	√
	Lack of riparian vegetation	√	√		√	√	√	√
Loss of natural features	New development		√		√	√	√	√
	Older, urban development/redevelopment		√		√	√	√	√

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Subwatershed Goals and Objectives

Individual Subwatershed Advisory Groups established goals and objectives for each Rouge subwatershed. Numerous resources provided a basis for these goals and objectives. Consideration was made for the designated and desired uses for each subwatershed, the vision for the Rouge River as stated by the Rouge Remedial Action Plan (RAP), and public opinion. Subwatershed goals establish a framework to guide long-term efforts to protect the existing values of the river and restore the impaired uses. Short-term objectives identify the conditions or activities that will be completed within the next five years as interim steps in achieving the long-term goals, those that will be realized beyond five years. The short-term objectives have measurable outcomes that can be used to monitor progress. Examples of Rouge River subwatershed goals and corresponding objectives include:

- Goal:** Reduce Excessive River Flows.
Objective: Evaluate the effectiveness of current design requirements for onsite stormwater management in county, township, and city permit and site plan approval processes to assure effective control of the volume of stormwater runoff.

- Goal:** Remove sources of pollution that threaten public health.
Objective: Develop detailed plans and approved schedules for satisfactorily addressing known SSOs.

- Goal:** Increase public understanding of their role in protecting water quality.
Objective: Develop and/or promote existing public involvement programs (workshops, events, etc.) to improve the public's understanding of their role in protecting water quality.

- Goal:** Reduce soil erosion and sedimentation.
Objective: Revise ordinances to prevent, minimize and reduce soil erosion and sedimentation, especially from construction sites.

The designated and desired uses for each subwatershed, as well as the vision for the Rouge River as stated by the RAP, individual Subwatershed Advisory Groups and the public, provided a basis from which to build long-term goals and objectives for each subwatershed. Table 3 summarizes the general goal topics established for each Rouge subwatershed.

Table 3: Subwatershed Goals

Goals Identified Related To:	Upper	Middle 1	Middle 3	Lower 1	Lower 2	Main 1-2	Main 3-4
Flow	√	√		√	√	√	√
Water Quality		√	√	√	√		√
Soil Erosion/Sedimentation	√	√		√	√	√	
Public Health	√		√		√	√	√
River Aesthetics	√					√	

Rouge River National Wet Weather

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11/25/03

Demonstration Project

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Goals Identified Related To:	Upper	Middle 1	Middle 3	Lower 1	Lower 2	Main 1-2	Main 3-4
River Ecosystem and Habitat	√	√	√	√	√	√	√
Recreation		√	√	√		√	√
Education		√	√	√	√		√
Great Lakes Quality						√	
Institutional Arrangements and/or Financing		√	√	√			
Subwatershed Monitoring		√		√			
Stormwater Management in Planning and Land Use Approval Process		√		√			
Enforcement and Accountability for Stormwater Management		√		√			
General Storm Water Permit			√				

Management Alternatives and Planned Actions

There are variety of alternative actions that can be used to achieve the goals established for protection and restoration of each Rouge Subwatershed. The communities and agencies within the Rouge Watershed identified the ongoing actions during 1999 and 2000, and those planned through 2005 to assist in meeting the long-term goals and short-term objectives. Over 250 different types of management practices and activities are planned or are currently underway throughout the Rouge Watershed. Participating communities and agencies have described a combined total of more than 1,100 activities. Table 4 summarizes alternative actions identified by the Rouge Subwatersheds. These actions are grouped by the related goal category they address.

Table 4: Management Practice Activities to Address Subwatershed Goals

FLOW	
<ul style="list-style-type: none"> • Reduce directly connected impervious surfaces • Slow stormwater runoff 	<ul style="list-style-type: none"> • Construct/maintain wet detention ponds • Construct/maintain stormwater infiltration devices
WATER QUALITY	
<ul style="list-style-type: none"> • Street sweeping • Reduce fertilizer runoff and phosphorous discharge • Conduct household hazardous materials management programs 	<ul style="list-style-type: none"> • Support environmentally friendly lawn and garden maintenance • Install/maintain oil and grease trap devices

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SOIL EROSION/SEDIMENTATION	
<ul style="list-style-type: none"> • Control soil erosion • Perform sewer system cleaning • Perform catch basin cleaning • Construct/maintain detention and/or retention ponds • Construct/maintain media filters 	<ul style="list-style-type: none"> • Use engineered streambank stabilization measures • Prevent and remove stream obstructions • Assure soil stabilization measures used • Install/maintain sediment trapping devices
PUBLIC HEALTH	
<ul style="list-style-type: none"> • Identify and control untreated CSOs • Identify and control SSOs without causing basement flooding • Identify and eliminate illicit discharges 	<ul style="list-style-type: none"> • Identify and eliminate failing OSDS • Perform septic system/sanitary sewer maintenance • Maintain infrastructure
RIVER AESTHETICS	
<ul style="list-style-type: none"> • Continue participation in annual Rouge Rescue/River Day • Educate riparian landowners about their responsibilities 	<ul style="list-style-type: none"> • Provide "hotline" to report illegal dumping or disposal practices • Publicize correct disposal practices for household waste
RIVER ECOSYSTEM AND HABITAT	
<ul style="list-style-type: none"> • Improve or create fisheries and wildlife habitat • Identify opportunities to create habitat in conjunction with other public or private water management projects 	<ul style="list-style-type: none"> • Preserve and enhance existing wetlands • Develop and encourage the implementation of best management practices for park lands, golf course, and other publicly owned lands adjacent to the river to assure that maintenance practices adequately protect water quality
RECREATION	
<ul style="list-style-type: none"> • Reduce geese populations • Land Use Planning and Management 	<ul style="list-style-type: none"> • Continue/expand litter and debris clean up
EDUCATION	
<ul style="list-style-type: none"> • Develop and implement public participation program • Inform residents of the costs and benefits involved in restoring the river 	<ul style="list-style-type: none"> • Encourage riparian land owners to manage their waterfront as an asset to enhance property values • Encourage use of parklands adjacent to the river
GREAT LAKES QUALITY	
<ul style="list-style-type: none"> • Produce and distribute education and information materials for homeowners on proper disposal of hazardous waste, minimization of lawn and garden chemical use, and problems associated with residential car washings 	<ul style="list-style-type: none"> • Advertise "hot line" for reporting discharges of toxic pollutants • Enhance soil erosion and sediment control programs • Address discharges from CSOs and SSOs

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FINANCING AND/OR INSTITUTIONAL ARRANGEMENTS	
<ul style="list-style-type: none"> • Explore need for new staffing • Develop local financial arrangements 	<ul style="list-style-type: none"> • Determine entity to produce and coordinate technical watershed-wide information
SUBWATERSHED MONITORING	
<ul style="list-style-type: none"> • Work with MDEQ and RPO to review existing programs • Identify specific desired uses to direct monitoring 	<ul style="list-style-type: none"> • Establish additional long-term monitoring program
STORMWATER MANAGEMENT IN PLANNING AND LAND USE APPROVAL PROCESS	
<ul style="list-style-type: none"> • Creation of wetlands, woodlands/tree replacement, natural features setback, and zoning ordinances 	<ul style="list-style-type: none"> • Develop ordinance/incentive explanations/handbook • Ongoing education for land use decision makers
ENFORCEMENT AND ACCOUNTABILITY FOR STORMWATER MANAGEMENT	
<ul style="list-style-type: none"> • Develop and adopt water resource protection ordinances that are enforceable 	<ul style="list-style-type: none"> • Continue involvement in the Michigan Voluntary General Storm Water Permit program

Progress Measurement

The Subwatershed goals established to protect and restore water uses of the Rouge River are ambitious and may take several decades to accomplish. However, significant progress can be made over the next five years and the short-term objectives identify the progress that can be reasonably expected to occur if the actions contained in the Subwatershed Plans are fully implemented by the cooperating public agencies, private organizations, businesses, and residents. At the end of 2005 there should be sufficient information available to document whether or not the short-term goals have been met and what additional actions are needed to assure continuing progress toward meeting the long-term goals.

Table 5 summarizes measures to evaluate how effective the proposed Subwatershed actions have been in achieving short-term objectives and long-term goals. Where possible the measures focus on quantifiable improvements documented by direct sampling of the river. 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.

Table 5: Progress Measures for Rouge Subwatershed Goals

FLOW	
<ul style="list-style-type: none"> • Rainfall monitoring • USGS flow monitoring 	<ul style="list-style-type: none"> • Macroinvertebrate monitoring
WATER QUALITY	
<ul style="list-style-type: none"> • Dry and wet weather water quality sampling 	<ul style="list-style-type: none"> • Macroinvertebrate monitoring

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SOIL EROSION/SEDIMENTATION	
<ul style="list-style-type: none"> • Dry and wet weather total suspended solids sampling • Aesthetics monitoring 	<ul style="list-style-type: none"> • Habitat assessment, embeddedness and bottom deposition measures • Macroinvertebrate monitoring
PUBLIC HEALTH	
<ul style="list-style-type: none"> • Dry weather water quality monitoring for <i>E. coli</i> and DO 	<ul style="list-style-type: none"> • Wet weather water quality monitoring for <i>E. coli</i> and DO
RIVER AESTHETICS	
<ul style="list-style-type: none"> • Aesthetics monitoring 	<ul style="list-style-type: none"> • Dry and wet weather water quality monitoring for Total Phosphorus
RIVER ECOSYSTEM AND HABITAT	
<ul style="list-style-type: none"> • Evaluate frog and toad population trends 	<ul style="list-style-type: none"> • Macroinvertebrate monitoring • Fish monitoring
RECREATION	
<ul style="list-style-type: none"> • Recreation use and aesthetics monitoring/surveys 	<ul style="list-style-type: none"> • Dry and wet weather water quality monitoring for <i>E. coli</i>
EDUCATION	
<ul style="list-style-type: none"> • Evaluate participation in Rouge Rescue Days • Evaluate on the number of schools involved in Rouge Education Project (REP) • Evaluate the number of visitors community watershed/ stormwater websites 	<ul style="list-style-type: none"> • Evaluate participation in household hazardous waste collection days • Telephone or mail survey of watershed residents • Evaluate the types and amount of public education (PE) materials distributed and the number of households reached
GREAT LAKES QUALITY	
<ul style="list-style-type: none"> • Evaluate on the number of schools involved in Rouge Education Project (REP) • Evaluate the number of visitors community watershed/ stormwater websites 	<ul style="list-style-type: none"> • Telephone or mail survey of watershed residents • Evaluate the types and amount of PE materials distributed and the number of households reached
FINANCING AND/OR INSTITUTIONAL ARRANGEMENTS	
<ul style="list-style-type: none"> • Reporting on activities performed and evaluating success 	
SUBWATERSHED MONITORING	
<ul style="list-style-type: none"> • Reporting on activities performed and evaluating success 	
STORMWATER MANAGEMENT IN PLANNING AND LAND USE APPROVAL PROCESS	
<ul style="list-style-type: none"> • Reporting on activities performed and evaluating success 	
ENFORCEMENT AND ACCOUNTABILITY FOR STORMWATER MANAGEMENT	
<ul style="list-style-type: none"> • Reporting on activities performed and evaluating success 	

Subwatershed Plan Updates

The short-term objectives established in the Rouge Subwatershed Management Plans are to be implemented, as scheduled by each community, through 2005. These activities are part of a long-term effort to protect the Rouge River and restore the designated uses. The process for

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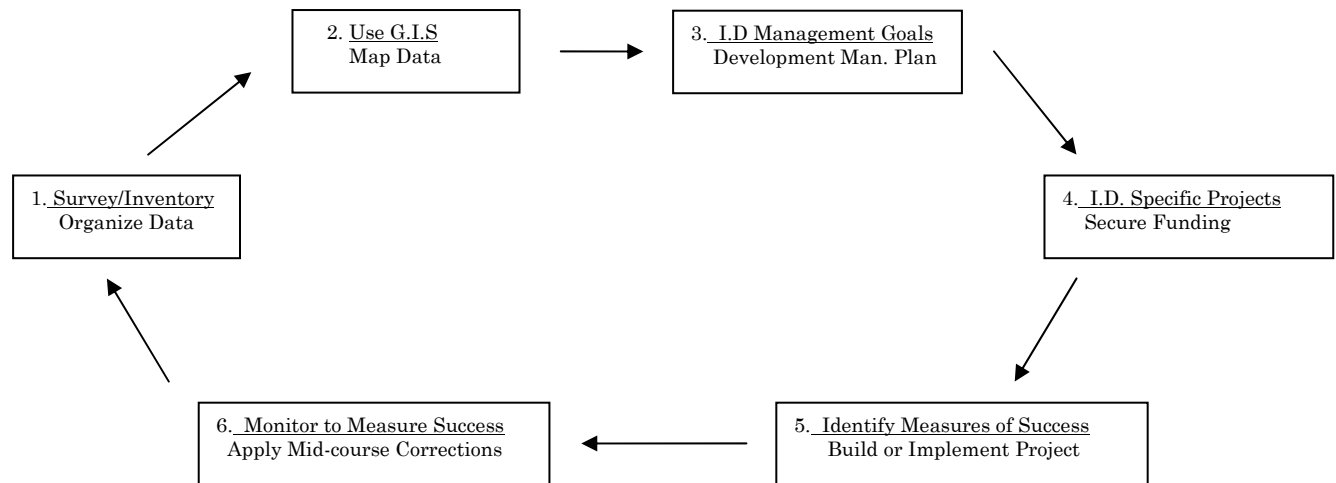
revising the plans will be based on results of the measures for progress. Revisions will begin in 2002 with a target for the first updates in 2005. The updated plans will document the success in achieving the short-term objectives, reassess long-term goals and schedule new initiatives for the next five-year period (2006-2011). Through this iterative process the communities and agencies will be able to evaluate and apply the most cost-effective approaches to protecting and restoring the river to meet the long-term goals consistent with state and federal water quality requirements.

As in the development of the plans, the public will be invited to participate in the review of progress, in the reassessment of long-term goals, and in consideration of alternative actions for the next five-year period. Public meetings and formal hearings before local governing bodies will be provided at a minimum. Workshops and/or other public involvement mechanisms may be utilized to assist in obtaining public input and support of plan revisions. Within the next five years the Rouge Subwatershed Advisory Groups intend to meet periodically to share data, assess progress and review new information on best management practices. Based upon new information, the Subwatershed Advisory Groups may recommend modifications to the Subwatershed Management Plans prior to the 2005 update.

Appendix B

Schematic Relationship of Mechanism to Provide Resources to Reduce Impairments Degrading Fish and Wildlife Populations

The following schematic illustrates the relationship between the components needed to implement and then evaluate the actions taken to effect positive changes in environmental and ecological parameters affecting fish and wildlife populations with the Rouge River Watershed.



The scheme above shows the relationships between the various program elements. Each element above the line leads to a product that is needed to carry the process forward in a logical sequence of events leading to implementation and then evaluation of any action that has been undertaken. Notice that the entire process is cyclic. That is, the final element leads back to the first element (Survey/Inventory) showing that the process can be an on-going, or can be terminated once the original management goals have been achieved. This scheme applies to different geographical scales (watershed, sub-watershed, or creekshed).

Appendix C

Amphibians and Reptiles in the Rouge River Watershed¹¹

Amphibians and reptiles in the watershed that require an aquatic or wetland environment. Endangered, threatened, and special concern (defined as rare, may become endangered or threatened in the future) species are noted. Data from: J. Craves, University of Michigan-Dearborn, T. Payne, Michigan Department of Natural Resources, Wildlife Division, K. Gourlay, Michigan Department of Natural Resources, Parks and Recreation Division.
Sittings: confirmed = C; within range = R.

Common name	Scientific name	Sittings
Salamanders		
Blue-spotted salamander	<i>Ambystoma laterale</i>	C
Small-mouthed salamander	<i>Ambystoma texanum</i> (endangered)	R
Spotted salamander	<i>Ambystoma maculatum</i>	C
Eastern tiger salamander	<i>Ambystoma tigrinum tigrinum</i>	C
Mudpuppy	<i>Necturus maculosus</i>	R
Eastern newt	<i>Notophthalmus viridescens</i>	R
Red-spotted newt	<i>Notophthalmus viridescens viridescens</i>	R
Red-backed salamander	<i>Plethodon cinereus</i>	C
Four-toed salamander	<i>Hemidactylium scutatum</i>	R
Tiger salamander	<i>Ambystoma tigrinum</i>	R
Lizards		
Five-lined skink	<i>Eumeces fasciatus</i>	R
Frogs and Toads		
Blanchard's cricket frog	<i>Acris crepitans blanchardi</i> (special concern)	R
Eastern American toad	<i>Bufo americanus</i>	C
Northern spring peeper	<i>Pseudacris crucifer</i>	C
Eastern gray tree frog	<i>Hyla versicolor</i>	C
Cope's gray tree frog	<i>Hyla chrysoscelis</i>	R
Western chorus frog	<i>Pseudacris triseriata triseriata</i>	C
Bullfrog	<i>Rana catesbeiana</i>	C
Green frog	<i>Rana clamitans melanota</i>	C
Northern leopard frog	<i>Rana pipiens</i>	C
Pickerel frog	<i>Rana palustris</i>	C
Wood frog	<i>Rana sylvatica</i>	C
Turtles		
Spiny softshell	<i>Apalone spinifera</i>	C
Snapping turtle	<i>Chelydra serpentina</i>	C
Painted turtle	<i>Chrysemys picta</i>	C
Spotted turtle	<i>Clemmys guttata</i> (special concern)	R
Wood turtle	<i>Clemmys insculpta</i> (special concern)	C
Blanding's turtle	<i>Emydoidea blandingii</i> (special concern)	C
Common map turtle	<i>Graptemys geographica</i>	C
Red-eared slider	<i>Trachemys scripta elegans</i>	C
Common musk turtle	<i>Sternotherus odoratus</i>	R
Eastern box turtle	<i>Terrapene carolina carolina</i> (special concern)	C

Appendix C

Common name	Scientific name	Sitings
Snakes		
Kirtland's water snake	<i>Clonophis kirtlandi</i> (endangered)	R
Northern water snake	<i>Nerodia sipedon</i>	C
Queen snake	<i>Regina septemvittata</i>	R
Eastern massasauga rattlesnake	<i>Sistrurus catenatus</i> (special concern)	C
Northern ribbon snake	<i>Thamnophis sauritus septentrionalis</i>	
C		
Eastern garter snake	<i>Thamnophis sirtalis</i>	C
Butler's garter snake	<i>Thamnophis butleri</i>	R
Eastern hognose snake	<i>Heterodon platyrhinos</i>	C
Black rat snake	<i>Elaphe obsoleta obsoleta</i> (special concern)	R
Brown snake	<i>Storeria dekayi</i>	C
Blue racer	<i>Coluber constrictor foxi</i>	C
Northern red-bellied snake	<i>Storeria occipitomaculata</i>	C
Eastern milk snake	<i>Lampropeltis triangulum</i>	C
Eastern fox snake	<i>Elaphe vulpina gloydi</i> (threatened)	R
Northern ringneck snake	<i>Diadophis punctatus edwardsi</i>	R
Eastern smooth green snake	<i>Liochlorophis vernalis vernalis</i>	R

Appendix D

Mammals in the Rouge River Watershed¹¹

Mammals in the Rouge River watershed that use aquatic, wetland, or riparian habitats.

Data from: O. Gelderloos, University of Michigan-Dearborn, T. Payne, Michigan Department of Natural Resources, Wildlife Division.

Sitings: confirmed = C.

Common name	Scientific name	Sitings
Red fox	<i>Vulpes vulpes</i>	C
Gray fox	<i>Urocyon cinereoargenteus</i>	C
Raccoon	<i>Procyon lotor</i>	C
Muskrat	<i>Ondatra zibethicus</i>	C
Eastern mole	<i>Scalopus aquaticus</i>	C
Fox squirrel	<i>Sciurus niger</i>	C
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>	C
Eastern chipmunk	<i>Tamias striatus</i>	C
White-footed mouse	<i>Peromyscus leucopus</i>	C
Deer mouse	<i>Peromyscus maniculatis</i>	C
Meadow vole	<i>Microtus pennsylvanicus</i>	C
Mink	<i>Mustela vison</i>	C
Opossum	<i>Didelphis virginiana</i>	C
Red bat	<i>Lasarius borealis</i>	C
Big brown bat	<i>Eptesicus fuscus</i>	C
Southern flying squirrel	<i>Glaucomys volans</i>	C
White-tailed deer	<i>Odocoileus virginianus</i>	C
Ground hog	<i>Marmota monax</i>	C

Appendix E

Natural Features of the Rouge River Watershed¹¹

Data from: Michigan Department of Natural Resources, Wildlife Division, Natural Features Inventory, November 7, 1995.

Status Codes: E=endangered, T=threatened, SC=special concern (rare, may become E or T in the future). No species are federally listed. Blanks indicate that none of the categories are applicable.

Common name	Scientific name or feature	State status
Oakland County		
<i>Novi Township</i>		
Redside dace	<i>Clinostomus elongatus</i>	T
Showy orchis	<i>Galearis spectabilis</i>	SC
Great blue heron rookery		
Green violet	<i>Hybanthus concolor</i>	SC
Twinleaf	<i>Jeffersonia dyphylla</i>	SC
Sullivant's milkweed	<i>Asclepias sullivantii</i>	T
Prairie rose	<i>Rosa setegera</i>	SC
Dry-mesic southern forest		
Seedbox	<i>Ludwigia alternivolia</i>	T
Three-awned grass	<i>Aristida longespica</i>	T
<i>Farmington Hills</i>		
Redside dace	<i>Clinostomus elongatus</i>	T
<i>West Bloomfield Township</i>		
Pugnose shiner (Walnut Lk., 1906)	<i>Notropis anogenus</i>	SC
Dry-mesic southern forest		
Vasey's pondweed	<i>Potamogeton vaseyi</i>	T
<i>Bloomfield Township</i>		
American chestnut	<i>Castanea dentate</i>	E
Least shrew	<i>Cryptotis parva</i>	T
Washtenaw County		
<i>Superior Township</i>		
Champion tree, blue ash	<i>Fraxinus quadrangulata</i>	
Wayne County		
<i>Plymouth & Northville Townships</i>		
Redside dace	<i>Clinostomus elongatus</i>	T
Champion tree, wild crab apple	<i>Malus coronaria</i>	
Mesic southern forest		
Goldenseal	<i>Hydrastis canadensis</i>	T
<i>Livonia</i>		
Shellbark or kingnut hickory	<i>Carya laciniosa</i>	SC
<i>Canton Township</i>		
Compass-plant	<i>Silphium laciniatum</i>	T

Appendix E

Common name	Scientific name or feature	State status
Wayne County (continued)		
<i>Detroit</i>		
False pimpernel	<i>Lindernia anagallidea</i>	SC
Prairie trillium	<i>Trillium recurvatum</i>	T
Northern madtom	<i>Noturus stigmosus</i>	E
<i>T02S, R09E</i>		
American chestnut	<i>Castanea dentata</i>	E
Champion tree, cottonwood	<i>Populus deltoides</i>	
<i>T02S, R10E</i>		
Cup-plant	<i>Silphium perfoliatum</i>	T
Prairie rose	<i>Rosa setigera</i>	SC
Champion tree, pin oak	<i>Quercus palustris</i>	
Compass-plant	<i>Silphium laciniatum</i>	T
<i>T02S, R11E</i>		
Northern madtom (mouth of river)	<i>Noturus stigmosus</i>	E
Showy orchis	<i>Galearis spectabilis</i>	SC
Cup-plant	<i>Silphium perfoliatum</i>	T

Appendix F

Birds Regularly Occurring in the Rouge River Watershed¹¹

Data from: J. Craves, University of Michigan-Dearborn, T. Payne, Michigan Department of Natural Resources, Wildlife Division.

B = Breeding species in the watershed.

Common name	Scientific name	Breeding Status
Common loon	<i>Gavia immer</i>	
Pied-billed grebe	<i>Podilymbus podiceps</i>	
Double-crested cormorant	<i>Phalacrocorax auritus</i>	
Great blue heron	<i>Ardea herodias</i>	B
Great egret (American egret)	<i>Ardea alba</i>	B
Green heron	<i>Butorides virescens</i>	B
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	B
Turkey vulture	<i>Cathartes aura</i>	B
Canada goose	<i>Branta canadensis</i>	B
Mute swan	<i>Cygnus olor</i>	B
Tundra swan (Whistling swan)	<i>Cygnus columbianus</i>	
Wood duck	<i>Aix sponsa</i>	B
Gadwall	<i>Anas strepera</i>	
American wigeon	<i>Anas americana</i>	
American black duck	<i>Anas rubripes</i>	B
Mallard	<i>Anas platyrhynchos</i>	B
Blue-winged teal	<i>Anas discors</i>	B
Northern shoveler	<i>Anas clypeata</i>	
Northern pintail	<i>Anas acuta</i>	
Green-winged teal	<i>Anas crecca</i>	
Canvasback	<i>Aythya valisineria</i>	
Redhead	<i>Aythya americana</i>	
Ring-necked duck	<i>Aythya collaris</i>	
Greater scaup	<i>Aythya marila</i>	
Lesser scaup	<i>Aythya affinis</i>	
Common goldeneye	<i>Bucephala clangula</i>	
Hooded merganser	<i>Lophodytes cucullatus</i>	
Common merganser	<i>Mergus merganser</i>	
Osprey	<i>Pandion haliaetus</i>	
Bald eagle	<i>Haliaeetus leucocephalus</i>	
Northern harrier	<i>Circus cyaneus</i>	
Sharp-shinned hawk	<i>Accipiter striatus</i>	
Cooper's hawk	<i>Accipiter cooperii</i>	B
Broad-winged hawk	<i>Buteo platypterus</i>	B
Red-shouldered Hawk	<i>Buteo lineatus</i>	B
Red-tailed hawk	<i>Buteo jamaicensis</i>	B
American kestrel	<i>Falco sparverius</i>	B
Peregrine falcon	<i>Falco peregrinus</i>	B
Ring-necked pheasant	<i>Phasianus colchicus</i>	B
Northern bobwhite	<i>Colinus virginianus</i>	B
Virginia rail	<i>Rallus limicola</i>	B
Sora	<i>Porzana carolina</i>	B
Common moorhen	<i>Gallinula chloropus</i>	B
American coot	<i>Fulica americana</i>	B
Sandhill crane	<i>Grus canadensis</i>	
Killdeer	<i>Charadrius vociferus</i>	B

Appendix F

Common name	Scientific name	Breeding Status
Greater yellowlegs	<i>Tringa melanoleuca</i>	
Lesser yellowlegs	<i>Tringa flavipes</i>	
Solitary sandpiper	<i>Tringa solitaria</i>	
Spotted sandpiper	<i>Actitis macularia</i>	B
Upland sandpiper	<i>Bartramia longicauda</i>	B
Common snipe	<i>Gallinago gallinago</i>	
American woodcock	<i>Sclopax minor</i>	B
Ring-billed gull	<i>Larus delawarensis</i>	
Herring gull	<i>Larus argentatus</i>	
Caspian tern	<i>Sterna caspia</i>	
Common tern	<i>Sterna hirundo</i>	
Forster's tern	<i>Sterna forsteri</i>	
Rock dove	<i>Columba livia</i>	B
Mourning dove	<i>Zenaida macroura</i>	B
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	B
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	B
Eastern screech-owl	<i>Otus asio</i>	B
Great horned owl	<i>Bubo virginianus</i>	B
Northern saw-whet owl	<i>Aegolius acadicus</i>	
Common nighthawk	<i>Chordeiles minor</i>	B
Chimney swift	<i>Chaetura pelagica</i>	B
Ruby-throated hummingbird	<i>Archilochus colubris</i>	B
Belted kingfisher	<i>Ceryle alcyon</i>	B
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	B
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	B
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	
Downy woodpecker	<i>Picoides pubescens</i>	B
Hairy woodpecker	<i>Picoides villosus</i>	B
Northern flicker	<i>Colaptes auratus</i>	B
Eastern wood-pewee	<i>Contopus virens</i>	B
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>	
Acadian flycatcher	<i>Empidonax virescens</i>	B
Alder flycatcher	<i>Empidonax alnorum</i>	B
Willow flycatcher	<i>Empidonax traillii</i>	B
Least flycatcher	<i>Empidonax minimus</i>	B
Eastern phoebe	<i>Sayornis phoebe</i>	B
Great-crested flycatcher	<i>Myiarchus crinitus</i>	B
Eastern kingbird	<i>Tyrannus tyrannus</i>	B
White-eyed vireo	<i>Vireo griseus</i>	B
Yellow-throated vireo	<i>Vireo flavifrons</i>	B
Blue-headed vireo	<i>Vireo solitarius</i>	
Warbling vireo	<i>Vireo gilvus</i>	B
Philadelphia vireo	<i>Vireo philadelphicus</i>	
Red-eyed vireo	<i>Vireo olivaceus</i>	B
Blue jay	<i>Cyanocitta cristata</i>	B
American crow	<i>Corvus brachyrhynchos</i>	B
Horned Lark	<i>Eremophila alpestris</i>	B
Purple Martin	<i>Progne subis</i>	B
Tree swallow	<i>Tachycineta bicolor</i>	B
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	B
Bank swallow	<i>Riparia riparia</i>	B

Appendix F

Common name	Scientific name	Breeding Status
Cliff swallow	<i>Hirundo pyrrhonota</i>	B
Barn swallow	<i>Hirundo rustica</i>	B
Black-capped chickadee	<i>Poecile atricapillus</i>	B
Tufted titmouse	<i>Baeolophus bicolor</i>	B
Red-breasted nuthatch	<i>Sitta canadensis</i>	
White-breasted nuthatch	<i>Sitta carolinensis</i>	B
Brown creeper	<i>Certhia americana</i>	B
Carolina wren	<i>Thryothorus lucovicianus</i>	B
House wren	<i>Troglodytes aedon</i>	B
Winter wren	<i>Troglodytes troglodytes</i>	
Marsh wren	<i>Cistothorus palustris</i>	B
Golden-crowned kinglet	<i>Regulus satrapa</i>	
Ruby-crowned kinglet	<i>Regulus calendula</i>	
Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	B
Eastern bluebird	<i>Sialia sialia</i>	B
Veery	<i>Catharus fuscescens</i>	B
Gray-cheeked thrush	<i>Catharus minimus</i>	
Swainson's thrush	<i>Catharus ustulatus</i>	
Hermit thrush	<i>Catharus guttatus</i>	
Wood thrush	<i>Hylocichla mustelina</i>	B
American robin	<i>Turdus migratorius</i>	B
Gray catbird	<i>Dumetella carolinensis</i>	B
Northern mockingbird	<i>Mimus polyglottos</i>	
Brown thrasher	<i>Toxostoma rufum</i>	B
European starling	<i>Sturnus vulgaris</i>	B
Cedar waxwing	<i>Bombycilla cedrorum</i>	B
Blue-winged warbler	<i>Vermivora pinus</i>	B
Golden-winged warbler	<i>Vermivora chrysoptera</i>	
Tennessee warbler	<i>Vermivora peregrina</i>	
Orange-crowned warbler	<i>Vermivora celata</i>	
Nashville warbler	<i>Vermivora ruficapilla</i>	
Northern parula	<i>Parula americana</i>	
Yellow warbler	<i>Dendroica petechia</i>	B
Chestnut-sided warbler	<i>Dendroica pensylvanica</i>	
Magnolia warbler	<i>Dendroica magnolia</i>	
Cape May warbler	<i>Dendroica tigrina</i>	
Black-throated blue warbler	<i>Dendroica caerulescens</i>	
Yellow-rumped warbler	<i>Dendroica coronata</i>	
Black-throated green warbler	<i>Dendroica virens</i>	
Blackburnian warbler	<i>Dendroica fusca</i>	
Pine warbler	<i>Dendroica pinus</i>	
Palm warbler	<i>Dendroica palmarum</i>	
Bay-breasted warbler	<i>Dendroica castanea</i>	
Blackpoll warbler	<i>Dendroica striata</i>	
Cerulean warbler	<i>Dendroica cerulea</i>	
Black-and-white warbler	<i>Mniotilta varia</i>	
American redstart	<i>Setophaga ruticilla</i>	
Ovenbird	<i>Seiurus aurocapillus</i>	B
Northern waterthrush	<i>Seiurus noveboracensis</i>	
Louisiana waterthrush	<i>Seiurus motacilla</i>	

Appendix F

Common name	Scientific name	Breeding Status
Connecticut warbler	<i>Oporornis agilis</i>	
Mourning warbler	<i>Oporornis philadelphia</i>	
Common yellowthroat	<i>Geothlypis trichas</i>	B
Wilson's warbler	<i>Wilsonia pusilla</i>	
Canada warbler	<i>Wilsonia Canadensis</i>	
Yellow-breasted chat	<i>Icteria virens</i>	
Scarlet tanager	<i>Piranga olivacea</i>	B
Eastern (rufous-sided) towhee	<i>Pipilo erythrophthalmus</i>	B
American tree sparrow	<i>Spizella arborea</i>	
Chipping sparrow	<i>Spizella passerina</i>	B
Field sparrow	<i>Spizella pusilla</i>	B
Vesper sparrow	<i>Pooecetes gramineus</i>	B
Savannah sparrow	<i>Passerculus sandwichensis</i>	B
Fox sparrow	<i>Passerella iliaca</i>	
Song sparrow	<i>Melospiza melodia</i>	B
Lincoln's sparrow	<i>Melospiza lincolnii</i>	
Swamp sparrow	<i>Melospiza georgiana</i>	
White-throated sparrow	<i>Zonotrichia albicollis</i>	
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	
Dark-eyed junco	<i>Junco hyemalis</i>	
Northern cardinal	<i>Cardinalis cardinalis</i>	B
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	B
Indigo bunting	<i>Passerina cyanea</i>	B
Bobolink	<i>Dolichonyx oryzivorus</i>	B
Red-winged blackbird	<i>Agelaius phoeniceus</i>	B
Eastern meadowlark	<i>Sturnella magna</i>	B
Common grackle	<i>Quiscalus quiscula</i>	B
Brown-headed cowbird	<i>Molothrus ater</i>	B
Baltimore oriole	<i>Icterus galbula</i>	B
Orchard oriole	<i>Icterus spurius</i>	
House finch	<i>Carpodacus mexicanus</i>	B
American goldfinch	<i>Carduelis tristis</i>	B
House sparrow	<i>Passer domesticus</i>	B

Appendix G

ROUGE CONTACTS & RRAC MEMBERS

Friends of the Rouge
Carolyn Foster----- (734) 792-9900

Holliday Nature Preserve
Bill Craig----- (248) 476-5127

MDEQ Staff
Allison McCormick----- (734) 432-1291

Oakland County Drain Commission
Ron Fadoir----- 248) 858-5248

Southeast Michigan Land Conservancy
Jack Smiley----- (313) 582-8377

University of MI-Dearborn Environmental Interpretive Center
Orin Gelderloos----- (313) 593-5339

Washtenaw County DEIS
Rich Badics----- (734) 222-3800

Wayne County Department of Environment
Noel Mullett----- (734) 326-4486

Subwatershed Advisory Group Representatives

Robert Belair, Lower 1 Subwatershed Advisory Group----- (734) 394-5154

Ron Fadoir, Main 1 & 2 Subwatershed Advisory Group----- (248) 858-5248

Jim Zoumbaris, Middle 3/Lower 2 Subwatershed Advisory Group----- (734) 466-2606

Robert Beckley, Upper Subwatershed Advisory Group----- (734) 466-2606

James D. Anulewicz, Middle 1 Subwatershed Advisory Group----- (734) 453-8131
ext. 23

John Kozuh, Main 3-4 Subwatershed Advisory Group----- (313) 928-4111

Appendix G

Other Resources:

Rouge web site – <http://rougeriver.com>

David A. Mifsud (M.S. Candidate) Herpetologist, City of Ann Arbor (For information on “turtle crossings”)

Phone (mobile) (313) 268-6189

E-mail (1): Davidmifsud@comcast.net

E-mail (2): Miffer@umich.edu

CURRENT RRAC MEMBERSHIP

Rich Badics, Washtenaw County Department of Environment and Infrastructure Services

Brandy Bakita, Southfield Parks and Recreation Department

Dan Ballnik, Ford Motor Company

Jack Barnes, Lower 2 SWAG Representative

Robert Belair, Lower 1 SWAG Representative

Kelly Cave, Wayne County Department of Environment

Carol Clements, Wayne County Parks Department

Bill Craig, Holliday Nature Preserve, RRAC Vice-Chair

Carolyn Foster, Friends of the Rouge

Orin Gelderloos, University of Michigan-Dearborn, 2004 RRAC Chair

Linda Ginsburg, Schafer Development

Barbara Goryca, Citizen Representative

Kurt Heise, Wayne County Department of Environment, 2003 RRAC Chair

Meroe Kaericher, Citizen Representative

Noel Mullett, Wayne County Department of Environment

Steve Olds, Natural Resources Conservation Service

George Rinke, Ford Motor Company

Philip Sanzica, Oakland County Drain Commission

Raj Sinha, Wayne County Health Department

Jack Smiley, Southeast Michigan Land Conservancy

Ted Starbuck, SEMCOG

Sue Vignoe, Middle 1 SWAG Representative

Gary Zorza, Upper SWAG Representative

Jim Zoumbaris, Middle 3 SWAG Representative

Vacant, Detroit Water and Sewerage Department

Vacant, Environmental Attorney

Vacant, Oakland County Health Department

Vacant, Student

Vacant, Teacher

Vacant, Main 1-2 SWAG Representative

Vacant, Main 3-4 SWAG Representative

Ex-Officio Members:

Allison McCormick, MDEQ Representative

Joe Rathbun, MDEQ Representative

Quintin White, USEPA-Region V

Jonathon Bulkley, Federal Court Representative

Appendix H

Selected Rouge River Monitoring Reports

- RPO reports are available on the RPO website: www.rougeriver.com
- Most MDNR and MDEQ reports may be obtained from Denise Page of MDEQ; 517-241-5821, or paged@michigan.gov. Provide the title and publication number (where available) when ordering.

Title (Source)	Date	Comments
Rouge River Quality: 1973-1986 (MDNR; MI/DNR/SWQ-87/043)	1987	Fish and macroinvertebrates; 23 stations watershed wide
Rouge River Ambient Monitoring Report (MDNR)	1988	Water quality; 22 stations watershed wide; weekly or monthly sampling
Rouge River Reconnaissance Survey (RPO)	1994	Survey of outfalls, sediments, and general stream characteristics over 90 miles of river
An Assessment of the Rouge River Fish Community (MDNR)	1995	The best recent watershed-wide fish survey
Rouge River Sediment Reconnaissance Survey (RPO)	1995	Sediment contaminants at 182 stations, watershed wide
Impoundment Limnological Report: 1994-1995 (RPO)	1996	Water quality, in 4 Middle Branch impoundments; cites previous studies
Aquatic Habitat Survey (RPO)	1998	Physical habitat; 83 locations, watershed wide
Rouge River Assessment (MDNR; Fisheries Division Special Report No. 22)*	1998	Review of historic data; biology, hydrology, water quality
Biological Assessment of the Rouge River: June-July, 2000 (MDEQ; MI/DEQ/SWQ-02/038)	2002	Macroinvertebrates at 39 locations and fish at 6; mostly headwater locations

Also very useful are the “Baseline Data Summary” reports published annually since 1993 by the RPO, and the regular reports on macroinvertebrate and frog & toad distributions based on the Friends of the Rouge volunteer monitoring programs.

*Available on the MDNR website (www.michigan.gov/dnr), under Institute for Fisheries Research library

Appendix I



DEC 29 2003

December 29, 2003

Ms. Allison McCormick
MDEQ-WD
38980 W. Seven Mile Rd.
Livonia, MI 48152

RE: 2003 Rouge River RAP

Dear Allison:

Our engineering staff has reviewed the RAP - Revision you provided on December 10th and we wanted to compliment you on the thoroughness of the document. We have only one suggestion to make relative to the various references in the document to achieving the goal of elimination of all SSO's.


It is neither practical, nor cost effective, to eliminate all SSO's. For "preventable" SSO's this could be an objective, albeit a costly one. My point is best perhaps explained with the following example. A community could design its sanitary sewer system to transport flows from the 10 year : 1 hour design storm, store flows up to the 25 year : 24 hour design storm and even possibly treat overflows above that threshold to the 100 year storm. However, should a 150 year equivalent design storm hit that community, untreated SSO's are inevitable. Thus I would be cautious in stating the goal as elimination of all SSO's.

Please contact me at (734) 394-5160 if you have any questions regarding this information.

Sincerely,

MUNICIPAL SERVICES

Tim Faas
Director

 Tim Faas, Director
734-394-5160
Building & Inspection Services
734-394-5200

DEPARTMENT OF MUNICIPAL SERVICES
1150 Canton Center S.
Canton, MI 48188-1699
www.canton-mi.org

Planning Services
734-394-5170
Public Works
734-394-5150

Appendix I

JAN - 6 2003

20050 Milburn
Livonia, MI 48152-1615

Allison McCormick, Rouge RAP Coordinator
MDEQ-SWQD
S.E. MI District Office
38980 West Seven Mile Road
Livonia, MI 48152-1006

Dear Mrs. McCormick:

Please accept the following as my comments on the 2003 Rouge RAP Revision. I am pleased that the revision is done. I know good thought and much effort was put into making this document user friendly for the general public, while providing the necessary elements of a useful remediation plan. Since the public must pay for the work necessary to accomplish most of the goals, making the plan less technical and less specific is logical for ensuring effective support and participation.

My greatest concern, however, is that until we have a true commitment to protect wetlands at all levels of government; national, state, county and local, the "loss of fish and wildlife habitat" use impairment will never move towards delisting. The Rouge River Watershed is not moving towards "no net loss". Wetlands are the only portion of the natural landscape with any degree of regulated protection, yet; wetlands are being over-emphasized as stormwater BMPs to promote development, which accelerates our loss of quality habitat (national and state policy), wetlands are being mitigated outside the watershed (state policy), wetland mitigation is far too controversial (state policy), wetland mitigation banking in Wayne County has been a costly failure (county policy), and many communities have not improved their local land use decisions enough to protect their wetland inventory (local policy).

It will take more than money, people, hard work and time to preserve, restore and protect the vital natural elements of the Rouge River Watershed. It will take a knowledgeable public who demands their public representatives address the goals of our habitat related use impairments. It takes public will and government will to achieve success in any endeavor, and our watershed needs much of both for the work that must be done. I believe the 2003 Rouge River RAP Revision provides sufficient information to motivate the general public and our representatives. Thank you for a plan that can work.

Sincerely,

William Craig
William Craig

1/5/04

Appendix I



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

January 7, 2004

Mr. Kurt Heise, RRAC Chair
WCDOE
415 Clifford Street
Detroit, MI 48226

JAN 13 2004

Dear Mr. Heise:

SUBJECT: 2004 Rouge River Remedial Action Plan Revision

On behalf of the Department of Environmental Quality (DEQ), I commend the efforts of the Rouge River Remedial Action Plan Advisory Council (RRAC) in the development of the *2004 Rouge Remedial Action Plan (RAP) Revision*. The document serves as an important guide in the implementation of actions that will achieve significant progress towards achieving the goal of delisting the Rouge River as a Great Lakes Area of Concern.

We support those goals and recommendations that comply with current environmental laws and regulations. The following are specific comments on the document:

1. In response to the Sanitary Sewer Overflow (SSO) and Combined Sewer Overflow goals of "Eliminate or provide adequate treatment and control for all wet weather overflows from separate sanitary sewers and combined sewers," the DEQ would add that this should be in compliance with existing state and federal requirements.
2. On page 48, under "How to Get There – Phase I," the fourth bullet states that the SSO policy should be clarified. In October 2003, DEQ Director Steven E. Chester provided an SSO policy clarification statement to address questions on the 2002 SSO Policy Statement.

It will require continued hard work on the part of all Rouge stakeholders, including the local communities, county, state, and federal agencies to realize the vision of:

"A Rouge River Watershed that is aesthetically pleasing, clean and safe, that supports a healthy, diverse fish and wildlife community, and that provides an enriching variety of recreational experiences."

Again, I wish to commend the RRAC for completing the 2004 RAP Revision. We look forward to being a partner in the continued restoration of the Rouge River. Should you

Appendix I

Mr. Kurt Heise
Page 2
January 7, 2004

require further information of a technical nature, please contact Ms. Allison McCormick, Southeast Michigan District Office, Water Division, at 734-432-1291, or you may contact me.

Sincerely,



Richard A. Powers, Chief
Water Division
517-335-4176

cc: Ms. Allison McCormick, DEQ

Appendix I



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

GLORIA J. JEFF
DIRECTOR

January 7, 2004

JAN 13 2004

Ms. Allison McCormick
Michigan Department of Environmental Quality
Water Division
38980 West Seven Mile Road
Livonia, Michigan 48152

Dear Ms. McCormick:

This letter is to provide the comments of the Michigan Department of Transportation (MDOT) on the Draft 2003 Rouge River Remedial Action Plan (RAP) Revision which was distributed for review at the December 10, 2003 meeting of the Rouge River Assembly.

MDOT is supportive of the draft RAP as presented and will continue to work cooperatively with storm water control efforts in the Rouge River watershed. As you know, MDOT is about to receive a Phase II National Pollutant Discharge Elimination System (NPDES) storm water permit from the Department of Environmental Quality (DEQ) that will govern MDOT storm water management activities on a statewide basis. This new permit will replace all existing MDOT storm water permits. MDOT will conduct its storm water management activities as required under that permit. While we will continue to work cooperatively with communities in the Rouge River watershed on storm water management activities, project specific needs will be addressed within the scope and limits of MDOT's authority, funding, permit requirements and other considerations that must be addressed in designing and implementing transportation projects.

Thank you for the opportunity to review this document.

Sincerely,


Seth Phillips
Environmental Coordinator
517-373-1908

cc: Zachare Ball, ECT, Rouge Program Office
Kathleen Hermann, TTMS
Gary Croskey, MDOT
Mike O'Malley, MDOT
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Sharon Ferman, MDOT

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Appendix I

Ms. Allison McCormick
MDEQ-WD
38980 W. Seven Mile Rd.
Livonia, MI 48152

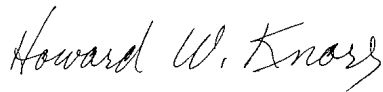
Dear Ms. McCormick:

In reviewing the Rouge Remedial Action Plan, I was struck by how many of the 41 goals listed in the Executive Summary are dependent upon successfully dealing with the problems created by impervious surfaces. While the revision recognizes this frequently throughout its length as an important factor in achieving the various goals, indeed, again in the Executive Summary, for example stating: "Flow has emerged as perhaps the most critical, technically and politically, difficult challenge for restoration and protection.", I feel imperviousness is crucial to the maintenance of the improvements already made in the River's quality as well as any future gains to be made. It is the factor which can profoundly determine the Rouge's future direction environmentally, and should be explored, studied and emphasized in a major straight-forward approach.

I became aware of problems and failures of under-emphasizing the problems of imperviousness at the 2003 Rouge Report Day. The event, held at Greenfield Village, celebrated the reconnection of the oxbow remnant there to the current channel of the Rouge. At the same time the work was being done on the oxbow previously pervious pavements in the Village were being paved with impervious concrete. Aside from wondering about the wisdom of installing very hard surfaces for walkways the are primarily used by pedestrians on long walking tours of the Village, it occurred to me that the extent of the pavement would probably cover the oxbow twice.

The Revision cites 1995 land use cover data saying that "23.1 percent of the Rouge Watershed has been transformed into impervious surface." This is a study that definitely needs updating. Urban sprawl has certainly increased that percentage as has the growing popularity of what are referred to as "bigfoots" or mini-mansions. Birmingham, for example, recently enacted an ordinance setting the upper limit for the amount of lot surface a residence could cover at 30%. Of that the remaining 40% may be paved. .

There has to be graphic education on the impact of impervious surfaces on the environment. The very definite limits of the usual solutions such as detention ponds must be pointed out. The value, economically as well as environmentally, of innovative solutions such as rain gardens, green roofs and pervious pavements as exist at the Ford Rouge Plant (and my driveway for that) must be promulgated if we are to make much more progress or even to keep that which has been made.



Citizen

Appendix J

An Evaluation of Existing Funding Sources *Provided by Southeast Michigan Council of Governments*

Federal Funding An evaluation of potential federal funding sources showed that available support continues to decline while basic pollution requirements in the Clean Water Act remain intact. This results in an increasing compliance burden on state and local governments.

1. Federal funding for water pollution control programs is rapidly declining.
2. Federal non-point source pollution control funds (Section 319 grants, Watershed Initiative Grants) are limited. Competition for the funding is intense.
2. Existing federal funding programs will not be sufficient for the remedial action measures needed to clean up the Rouge River.
3. Reduced federal funding means state and local governments must assume more pollution control costs.

State Funding Evaluation of state funding sources shows that despite federal cutbacks, increases in state funding are not forthcoming.

1. Money available from state funding for water pollution control is very limited. The major source of state funding support for water pollution control projects will not be in the form of grants. Legislation is being drafted to institute a State Revolving Fund (SRF). Based on current proposals for establishing an SRF program, funding will be inadequate to meet all of the projected statewide needs for wastewater treatment facilities. And financial constraints on the communities limit their ability to repay the loans. As a result, only projects that avoid enforcement actions are initiated. This does little to rehabilitate infrastructure.

In 2002, Michigan voters approved a \$1 billion bond to supplement the SRF program, providing up to an additional \$200 million per year available to municipalities in the form of low-interest loans.

2. Funding from existing state programs to support implementation of remedial action measures is minimal. Any new programs for revenue beyond that provided in the State Revolving Fund are unlikely without local communities initiating action.

Appendix J

Unconventional Funding So-called "unconventional" sources such as special districts should be viewed as mechanisms to raise revenue, not as additional sources of revenue.

1. Neither the Headlee tax limits nor the charter tax limits apply to special assessments. (Special assessments are not a tax).
2. Special assessments cannot be community-wide (this is prohibited by the Drain Code).
3. Special assessments cannot be based upon property values but must be based upon benefit.
4. Voluntary special assessments may be assessed by individual communities for a portion of the community's property owners.
5. Statutes, such as the Drain Code, which precede the Headlee Amendment and which have not been amended are not subject to the amendment.
6. The Drain Code can be used by drainage districts to levy taxes. Such taxes are not special assessments, but rather unlimited obligations of the community
 - A drainage district may be created by having at least two corporations (or communities) petition the State Department of Agriculture to form the district. Other corporations (or communities) may be added non-voluntarily to this group.
 - The federal courts have ruled that the Headlee Amendment does not supersede the Drain Code - so if a drainage district was created and a tax levied, the Headlee Amendment should not be a constraint.
 - A drainage district may receive taxing authority in two ways:
 - A. The drainage board, by majority vote, may petition the State Department of Agriculture for this authority, or
 - B. The Water Resources Commission could petition the Department of Agriculture for this authority.
 - Chapter 22 of the Drain Code can also be explored as a way to fund storm water activities in a designated watershed area.
7. A "471" agreement could be reached between local governments and the County Drain Commissioner in order to address storm water management mandates and SWPPI requirements.

Appendix K

Selected Federal and Foundation Funding Sources Available for Environmental Restoration Efforts in Michigan's Great Lakes Areas of Concern

Prepared by the
Statewide Public Advisory Council for Michigan's Areas of Concern Program
May 2001

NOTE: Some of the figures below represent Michigan or Great Lakes regional funding allocations, while others are nationwide appropriations.

<u>Army Corps of Engineers</u>	<i>FY 2001 Funding</i>
· Great Lakes Remedial Action Plans and Sediment Remediation	\$600,000
· Planning Assistance to States	\$6,700,000
· Great Lakes Sediment Transport Models	\$500,000
· Restoration of Environmental Quality	\$21,000,000
· Aquatic Ecosystem Restoration	\$19,000,000
· Beneficial Use of Dredged Material	\$4,000,000
· Environmental Dredging	\$1,500,000
<u>Environmental Protection Agency</u>	<i>FY 2001 Funding</i>
· Coastal Environmental Management	\$2,000,000
· Great Lakes National Program Office	\$3,150,000
· Water Pollution Control–State and Interstate Program Support	\$30,250,000
· Nonpoint Source Water Pollution Control	\$42,500,000
· State Wetlands Protection Grants	\$1,500,000
· Water Quality Management Planning	\$2,800,000
· National Pollutant Discharge Elimination System	\$2,700,000
· Five-Star Restoration Program	\$500,000 (FY '00)
· Wetlands Program Development Grants	\$15,000,000
<u>Department of Agriculture</u>	<i>FY 2001 Funding</i>
· Conservation Reserve Program	\$142,000,000
· Environmental Quality Incentives Program	\$199,942,800
· Watershed Protection and Flood Prevention Program	\$99,443,000
· Wetlands Reserve Program	\$143,000,000
<u>Department of Commerce, National Oceanic and Atmospheric Administration</u>	<i>FY 2001 Funding</i>
· Great Lakes Restoration Grants	\$7,000,000
· Coastal Zone Management Program	\$92,700,000
· Coastal Protection & Restoration Program	\$500,000
<u>U.S. Fish and Wildlife Service</u>	<i>FY 2001 Funding</i>
· Coastal Wetlands Planning, Protection and Restoration Act Program	\$11,300,000 (FY '00)
· National Coastal Wetlands Conservation Grant Program	\$15,000,000
· North American Wetlands Conservation Act Grants	\$72,600,000
· Partners for Fish and Wildlife Program	\$24,000,000

Appendix K

Foundation Funding Sources

FY 2001 Funding

· Michigan Great Lakes Protection Fund	\$2,000,000
· Great Lakes Protection Fund	\$2,300,000 (FY '00)
· Great Lakes Fisheries Trust	\$3,500,000
· Great Lakes Habitat Network	\$62,252 (FY '00)
· Joyce Foundation	\$12,500,000 (FY '00)
· The George Gund Foundation	\$20,850,000 (FY '00)
· C.S. Mott Foundation	\$19,000,000
· Rockefeller Family Fund	\$710,000

Other resources:

Appendix L

Example Funding Sources

Catalog of Federal Domestic Assistance (CDFA) - ENTIRE Federal government assistance link

1. **CDFA Home** <http://www.cfda.gov/default.htm>
2. **CDFA -grants sorted by deadline**
http://www.cfda.gov/public/browse_by_deadline.asp
3. **CDFA - sort by a category** <http://www.cfda.gov/public/faprs.htm>

EPA Grant Writing Tutorial

<http://www.epa.gov/seahome/grants/src/grant.htm>

EPA STAR RESEARCH GRANTS Database (many grants-check often for openings) <http://es.epa.gov/ncer/rfa/>

National Fish and Wildlife Foundation Grants (many grants - check often for openings) http://www.nfwf.org/programs/grant_apply.htm

Michigan Community Service Commission (MCSC)

<http://www.michigan.gov/mcsc/0,1607,7-137-6114-12046--,00.html>

Environmental Support Center (Washington DC) Many programs for grass roots orgs- check often for openings

<http://www.envsc.org/>

2003 Catalog of Federal Funding Sources for Watershed Protection

<http://cfpub.epa.gov/fedfund/>

An Internet Guide to Financing Stormwater Management

<http://stormwaterfinance.urbancenter.iupui.edu/>

Appendix M

Managing the Challenge: A Blueprint for Action

(modified from *Investing in Southeast Michigan's Quality of Life: Sewer Infrastructure Needs, Executive Summary, April 2001*)

The following action steps should be considered by governmental decision-makers.

Action Step One: Reduce Costs

1. Establish collaborative infrastructure planning.
 - Wastewater service providers should work together in identifying opportunities for providing the necessary service at a reduced cost.
 - State regulators should help identify the most cost-effective means of achieving water quality standards. (This includes implementation of the SSO control program)
 - Wherever possible, extended schedules for implementing remediation projects should be sought to reduce costs and make implementation more achievable.
 - A requirement that newly proposed regulations and laws affecting sewer infrastructure be subject to special review before adoption should be implemented.
 - Communities should review their master plans and zoning ordinances to identify ways to reduce sewer infrastructure needs. This should include assessing planning and design before development occurs, assuring that the full cost of development is borne by the developer and utilizing existing infrastructure wherever possible.
2. Place emphasis on watershed management.
 - Fiscal resources for environmental projects should be allocated and prioritized based on how they will improve water quality and not as a result of a regulatory checklist.
 - The most cost-effective projects should take precedence.
3. Implement pollution prevention.
 - Preventing pollution at the source remains the most cost effective means of control.
 - The region's citizens should actively participate in solving the problem.
 - The public sector should vigorously advocate public education efforts in full recognition that the responsibility to achieve water quality standards remains with the local units of government.
4. Continue to support innovative projects that demonstrate ways of reducing costs while protecting water resources.

Appendix M

Action Step Two: Increase Funding

1. Increase federal funding for sewer infrastructure projects.
 - Sewer infrastructure merits funding levels proportional to that for transportation infrastructure; at the very least, funding should be similar to that which existed in the 1970s and early 1980s.
2. Use the sewer-related needs identified in this report as a basis for determining an appropriate increase in capitalizing the State Revolving Fund (SRF).
 - A commitment to allocate \$135 million annually to the SRF program would result in about \$400 million annually in loans to support sewer needs.
3. Local communities will need to identify additional funding mechanisms.
 - Creation of a storm water utility or Chapter 20 drainage district could provide funding for storm water projects.
 - Review sewer rates to determine the adequacy of revenue to properly operate and maintain local wastewater treatment systems.
5. Implement widespread public education efforts to help rate-payers understand the need for additional financial resources and prepare them for expected increases in sewer rates.
 - Support for increased investment in sewer infrastructure hinges, in large part, on citizen awareness of both costs and benefits to the community.

Action Step Three: Brief Elected Officials and Other Decision-Makers on Report Findings

The actions described in steps one and two cannot be implemented unless and until key parties understand and support them. Groups needing the information in this report include:

- The Southeast Michigan Consortium for Water Quality;
- The Rouge Assembly;
- Environmental committees in the state legislature;
- Southeast Michigan representatives in the state legislature;
- Michigan's congressional delegation;
- The governor's office
- City/township/village elected officials
- The media
- Representatives of the private sector
- Citizens