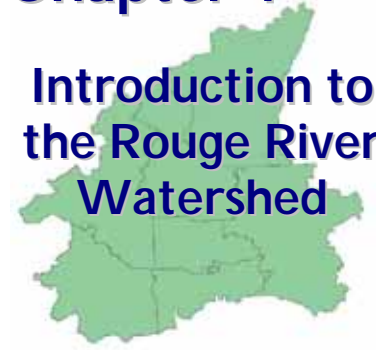


Chapter 1

Introduction to the Rouge River Watershed



In 2001, the seven subwatershed advisory groups of the Rouge River Watershed created seven individual management plans to guide the restoration of the separate sections of the Rouge River. At that time, the subwatershed management plans laid the groundwork to restore the uses of the Rouge River impaired by flow variability and non-point source pollution from storm water runoff along with high bacteria levels from CSOs and SSOs, and low dissolved oxygen levels for the Rouge River Watershed communities.

The Rouge River Watershed covers 466 square miles of southeast Michigan and is home to more than 1.3 million people in parts Oakland, Wayne and Washtenaw counties. The watershed's 48 communities comprise a diversity of land uses from the urbanized areas of Detroit, Livonia and Southfield to the developing areas of Troy, Canton Township and Novi, to the rural areas of Salem, Superior and Van Buren townships.

The Rouge River Watershed stakeholders have addressed many of the challenges since 2001 to improve the river's water quality. Accomplishments include:

- The establishment of an institutional mechanism to encourage watershed-wide cooperation and mutual support to meet water quality permit requirements and to restore beneficial uses of the river to area residents. The Alliance of Rouge Communities (ARC) is a voluntary public watershed entity currently comprised of 41 municipal governments, three counties and an airport authority.
- In 2007, under a community grant program funded through Wayne County, 21 storm water and CSO/SSO projects were completed costing approximately \$10 Million in total project costs. Another 25 projects, in the 2008 grant program, are underway totaling \$16 Million in project costs.
- Improved dissolved oxygen throughout the river. In 2007, monitoring data showed an upward trend at two sites in the Main 3-4 Subwatershed, the most urbanized and industrialized stretch of the Rouge River. Both sites indicate that conditions to support fish in the most downstream part of the Main Branch have been steadily and significantly improving, since monitoring began 12 years ago.
- The restoration of Carpenter Lake in Southfield, Quarton Lake in Birmingham and Kingswood Lake at Cranbrook Educational Community in Bloomfield Hills.
- The restoration of an oxbow at The Henry Ford in Dearborn.
- The ongoing efforts of partnerships like: 1) The Rouge Green Corridor, comprised of the cities of Southfield, Birmingham and Beverly Hills and partners Six Rivers Land Conservancy, Oakland County and Friends of the Rouge who are working to preserve the riparian corridor that connects those communities, and 2) the Rouge Gateway Partnership leading the effort for environmentally responsible redevelopment within the lower eight miles of the Rouge River's Main Branch.

- ◆ The lifting of the fish consumption advisory covering the general population for carp, channel catfish and largemouth bass from Newburgh Lake.
- ◆ The Lower Rouge Recreational Trail in Canton opened in 2008 and provides much needed improved access to recreational opportunities along the first 2.3 miles of a four-mile stretch of the Lower Rouge River.
- ◆ Wayne County continues to expand “grow zones,” the areas where turf grass has been removed and planted with native plants within the riparian corridors it manages and now have created 28 sites totaling 25 acres.
- ◆ Both Washtenaw and Wayne County instituted time-of-sale inspection of septic systems, which require correction of leaking or improperly sited septic fields when real estate is sold.
- ◆ The Wayne County Storm Water Ordinance was adopted in 2000 to help minimize flooding problems, streambank erosion and other impacts to natural resources down stream of development projects. The ordinance requires that management measures be implemented as part of development projects to reduce peak river flows and remove pollution from storm water runoff.
- ◆ The Alliance of Rouge Communities conducted septic system maintenance workshops and created various public education materials for watershed residents.
- ◆ Friends of the Rouge has educated thousands of watershed residents about river stewardship through its benthic macroinvertebrate sampling program, frog and toad survey workshops, the Rouge Education Project and the annual Rouge Rescue.

The updated, 2009 Rouge River Watershed Management Plan builds upon the accomplishments since 2001 and creates a framework for the continued progress toward the restoration of the Rouge River.

This watershed management plan identifies four primary pollutants affecting the Rouge River: pathogens, flow rate and volume, sediment, and nutrients. This watershed management plan is driven by six goals that will focus efforts on addressing these pollutants, the sources and their respective causes. They are:

- ◆ Reduce sources of pollution that threaten public health;
- ◆ Reduce runoff impacts through sustainable storm water management strategies and programs;
- ◆ Inform and educate the public to become watershed stewards;
- ◆ Protect, restore and/or enhance natural features to maintain/improve river and watershed ecosystems;
- ◆ Maximize community assets related to the watershed, and
- ◆ Support regional partnerships for the implementation of the watershed management plan.

Past actions have focused on the worst impacts: flooding, combined and sanitary sewer overflows and erosion control. A three-phased CSO control program was implemented that included construction of ten (10) CSO retention treatment basins and six sanitary and storm sewer separation projects. These projects have been completed and Table 1-1 identifies the locations of these Phase I CSO Retention Treatment Basins.

Table 1-1: Phase I CSO Retention Treatment Basins

Basin Name	Location
Redford	Glenhurst Golf Course
Inkster	Inkster Road, north of Michigan Avenue
Dearborn Heights	Middle Rouge Parkway
Acacia Park	North of Ronsdale Drive, west of Evergreen Road, Douglas-Evans Nature Preserve
Bloomfield Village	Cranbrook Road, north of 14 Mile Road
Birmingham	Linden Park, east of Shirley Drive, north of Lincoln
Seven Mile	Shiawassee Avenue, north of 7 Mile Road
Hubbell-Southfield	East of Southfield Freeway, south of Michigan Avenue, north of Rotunda Drive
Puritan-Fenkell	Eliza Howell Park
River Rouge	Jefferson Avenue and Victoria Street

Approximately 89 of the 127 miles of stream in the Rouge River Watershed are now free of the adverse impacts of uncontrolled CSO discharges. Primary tools have been public education, rate control structures, like detention ponds, and major civil projects such as the construction of 10 combined sewer overflow basins and sewer separation projects. Water quality has greatly improved in the Rouge River through these actions. Controlling overflows of raw sewage from combined sewers and sanitary sewers remain a key priority in the effort to restore the Rouge River and has paid the largest benefits. Ongoing major civil projects include:

- ◆ The City of Dearborn’s \$250 million CSO program. Currently, there are five CSO capture/treatment shafts under construction and five more under design.
- ◆ The City of Detroit has a CSO facility under construction, and bids have been accepted for several phases of the \$900 million Upper Rouge Tunnel, which will address most of the city’s remaining combined sewer overflows to the Rouge River.
- ◆ The City of Inkster is constructing a CSO retention treatment basin at Middlebelt Road, separating sewers and constructing a relief sewer. Additionally the city is correcting an illicit connection from a sanitary sewer system to storm sewer system.
- ◆ Wayne County is conducting a major SSO control project in its North Huron Valley/Rouge Valley Sewer System, which serves 615,000 people in 15 communities in southwestern Oakland County and western Wayne County. The \$20 Million effort will repair over 50% of the 1100 manholes and repair five comfort stations in Hines Park, which showed leaks to the system.

Additionally, work continues to address illicit connections, failing septic systems and other sources of bacterial pollution.

With continued progress on the largest pollutant sources, it is time to focus on more dispersed yet significant sources. In addition to the pollutant sources mentioned above, this plan has refined the focus on managing storm water runoff. While the previous watershed plans focused on implementing ordinances



The years of 1850-1940 were characterized by immigration, industrial development, and rapid urban growth. However, it was this development and growth that led to the first forms of river pollution. In the 1960's, the Rouge River was one of three rivers in the U.S. to actually catch on fire due to the large amount of oil on its surface. In the 1980s The International Joint Commission declared the Rouge one of the dirtiest rivers in the Midwest. It has only been in the last decade that significant restoration of water quality has begun to be documented as a result of over one billion dollars of investments by area residents for pollution control. Cooperative efforts at the local level to restore the Rouge River began in early 1980s. Since this effort has started many activities have been organized and completed to help improve water quality.

to address storm water flow rates and water quality, this plan additionally focuses on storm water runoff volume. As development has progressed across the landscape, natural areas, like wetlands, woodlands riparian corridors and vegetated areas have been converted to a variety of land use types that consist of higher percentages of impervious surfaces such as streets, parking lots, rooftops, compacted ground with turf vegetation. Increased impervious surfaces also cause an increase in the total volume of storm water runoff, the frequency of runoff reaching the streams, the peak flow rate of runoff and the quality of runoff.

While, historically, storm water ordinances addressed storm water flow rates and water quality, this watershed plan has refined that focus to additionally emphasize the reduction of storm water volume using various “green infrastructure” techniques.

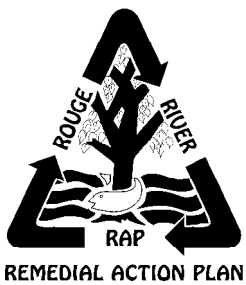
The use of green infrastructure techniques across the watershed will address the river’s “flashiness”. Green infrastructure techniques are sometimes referred to as Low Impact Development (LID) techniques. While LID is the terminology generally used for land development (or redevelopment), the “green infrastructure” is a broader term representing application in all areas, including new developments, redevelopments and existing properties. It is this last application that is the primary focus of green infrastructure implementation in the Rouge River Watershed. Green infrastructure employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing green infrastructure principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, green infrastructure can maintain or restore a watershed's hydrologic and ecological functions.

History of Rouge River Restoration Activities

Due to public outcry about the condition of the Rouge River in 1985, the State of Michigan adopted the Rouge River Basin Strategy. A key element in this strategy was the development of a plan to clean up the river – the Rouge River Remedial Action Plan (Rouge River RAP). The original RAP was completed in 1989 consistent with the commitments made by the states, Canadian provinces and two federal governments as part of a Great Lakes Water Quality Agreement. This international agreement signed by the United States and Canada identified 42 Areas of Concern (AOCs) in the Great Lakes Basin that needed attention. The Rouge River was one AOC listed (RRAC, 2004).

Rouge River RAP

In 1989, the original Rouge River RAP, a nine-volume document, defined an ambitious 20-year program of actions needed to protect the public health and to



make substantial progress to restore the impaired uses of the river. Since most of the large industrial and municipal wastewater treatment plant discharges were either in compliance or under corrective action plans, the RAP placed the major emphasis for corrective actions on the combined sewer overflows (CSOs) and storm water discharges. At the time, the full cost of clean-up was estimated at \$900 million. Subsequent updates of the original RAP indicate that the full cost to restore the river is much higher – exceeding \$2 billion.

The Rouge River RAP Advisory Council (RRAC) was established in 1993 and membership included a broad range of citizen, government and business stakeholders. The RRAC published the 1994 Rouge River Remedial Action Plan Update which included non-point source pollution impacts and noted the problems in the Rouge River, identified the causes and sources of pollutants of concern, and determined what actions were needed to correct the problems to prevent future ones. A Rouge RAP Progress Report was published in 1998.

The 2004 Rouge River RAP Revision modified many of the 1994 goals and recommendations based on new knowledge. The purpose of the revision was to applaud and highlight past efforts and accomplishments, support ongoing efforts and inspire new activities, and summarize existing watershed conditions as well as current restoration and protection efforts to achieve beneficial uses and improve the quality of life. (Rouge River RAP Revision, 2004). RRAC published “report cards,” in 1999 and 2005 to evaluate the condition of the Rouge River and rate the progress of various initiatives. To review RAP documents go to:
<http://www.epa.gov/glnpo/aoc/rougriv>.

The RRAC is currently working on delisting criteria for the Rouge River AOC and will continue to help implement projects that accomplish the Rouge River RAP goals.

The Rouge River National Wet Weather Demonstration Project

The Rouge River National Wet Weather Demonstration Project (Rouge Project) was initiated in 1992 by Wayne County (Michigan). This cooperative effort between federal, state and local agencies is supported by multi-year federal grants from the United States Environmental Protection Agency and additional funding from local communities.

The Rouge Project is a working example of how a systematic watershed approach to pollution management can result in cost-effective, timely achievement of designated uses in a water body. The Rouge Project is providing solutions to other urban watersheds throughout the country on how to restore a polluted urban waterway. The early focus of the Rouge Project was on the control of CSOs in the watershed. Although control of pollution from CSOs was identified as a major priority, it was determined that CSO control alone would not provide sufficient improvements to meet water quality standards. Non-point source pollutants, such as storm water runoff, discharges from illicit connections, discharges from failed on-site sewage disposal systems, also known as septic systems, and other sources

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would continue to degrade the river. Additionally, wetlands, habitat and lakes needed restoration and flow variability needed to be controlled before the Rouge River would be restored throughout the watershed. Based upon these earlier studies, the focus of the Rouge Project became holistic and considered the impacts from all sources of pollution and use impairments in receiving waters. This watershed management method is based on the use of a cooperative, locally-based approach to pollution control.

Alliance of Rouge Communities



The Alliance of Rouge Communities (ARC) is a voluntary public watershed entity currently comprised of 41 municipal governments (i.e., cities, townships, and villages), three counties (Oakland, Wayne, and Washtenaw) and the Wayne County Airport Authority as authorized by Part 312 (Watershed Alliances) of the Michigan Natural Resources and Environmental Protection Act (MCL 324.101 to 324.90106) as amended by Act No. 517, Public Acts of 2004.

The purpose of the ARC is to provide an institutional mechanism to encourage watershed-wide cooperation and mutual support to meet water quality permit requirements and to restore beneficial uses of the river to area residents.

The ARC members represent public agencies with water management responsibilities whose jurisdictional boundaries are partially or totally located within the Rouge River Watershed. The state law authorizing the formation of watershed alliances throughout Michigan was modeled after a Memorandum of Agreement (MOA) adopted by the Rouge River Watershed communities and counties in August of 2003, which successfully guided a regional effort over a three-year period to address watershed-wide water quality and water quantity issues.

The 2003 MOA was developed by the communities and the three counties to respond to declining federal grant funds to Wayne County for the Rouge Project that had supported watershed-wide management efforts since 1992. During the three years of operation under the MOA, the Rouge River Watershed communities voluntarily contributed nearly \$900,000 to match available federal funding for cooperative watershed management activities. The first year budget for the ARC (2006) was approximately \$600,000 provided by 50% local and 50% federal funding.

Under the ARC bylaws all cities, townships and villages, as well as the counties, located totally or partially within the Rouge River Watershed are eligible for membership. Over 95 percent of the eligible communities and counties have adopted the bylaws through formal action of their respective governing authorities. In addition, the bylaws provide for membership of other public entities, such as the Wayne County Airport Authority, in the watershed who under state law are required to have a storm water discharge permit.