

# Rouge River

## NATIONAL WET WEATHER DEMONSTRATION PROJECT

W A Y N E C O U N T Y • M I C H I G A N



**Alliance Members:**

- Auburn Hills
- Beverly Hills
- Bingham Farms
- Birmingham
- Bloomfield Hills
- Bloomfield Township
- Canton Township
- Commerce Township
- Dearborn
- Dearborn Heights
- Farmington
- Farmington Hills
- Franklin
- Garden City
- Lathrup Village
- Livonia
- Melvindale
- Northville
- Northville Township
- Novi
- Oak Park
- Oakland County
- Drain Commissioner
- Orchard Lake Village
- Plymouth
- Plymouth Township
- Pontiac
- Redford Township



*Working together, restoring the river*

- Rochester Hills
- Romulus
- Southfield
- Troy
- Van Buren Township
- Walled Lake
- Washtenaw County
- Wayne
- Wayne County
- Wayne County
- Airport Authority
- Westland
- Wixom

**Associate Members:**

- Henry Ford
- Community College
- University of Michigan
- Dearborn

**Cooperating Partners:**

- Cranbrook Institute of Science
- Friends of the Rouge
- Southeastern Oakland County Water Authority
- Wayne State University

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Photo Identification

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Photo 1: Rouge Valley Sewage Disposal System, construction of Short Term Corrective Action Plan, , photo courtesy, Wayne County Department of Public Services.

Photo 2: Rouge Valley Sewage Disposal System, construction of Short Term Corrective Action Plan, , photo courtesy, Wayne County Department of Public Services.

Photo 3: Randolph Street Inter-County Drainage District Streambank Restoration project, photo courtesy Oakland County Water Resources Commissioner and Hubbell, Roth & Clark, Inc.

Photo 4: “Toxic Tag – Bioaccumulation in the Food Web” presentation by the U.S. Fish and Wildlife Service at the Cranbrook 2010 Rouge River Water Festival, photo credit Lisa Appel, Cranbrook Educational Community

Photo 5: Canton Township Lower Rouge River Recreational Trail Bridge project, photo courtesy Robert Belair, Canton Township.

Photo 6: Pheasant Run Golf Club Detention Basins Enhancements - Canton Township photo courtesy Robert Belair Canton Township.

Photo 7: Randolph Street Inter-County Drainage District Streambank Restoration project, photo courtesy Oakland County Water Resources Commissioner and Hubbell, Roth & Clark, Inc.

## EXECUTIVE SUMMARY

Since the inception of the Rouge River National Wet Weather Demonstration Project (Rouge Project) in 1992, there has been continued and substantial progress toward restoring the Rouge River and preserving it for future generations. Many projects completed or underway with Rouge Project funding in 2011 focused on the variety of topics needed to restore the river: getting people involved, implementing flow and pollution controls, and improving access to recreational opportunities along the river. Watershed communities, businesses and residents are involved in ways big and small, and have formed innovative partnerships, such as the Alliance of Rouge Communities (ARC), to leverage ideas and resources to achieve common environmental goals. Water quality continues to improve, and the numbers and variety of wildlife living in the river and the watershed are increasing.

During 2011, watershed stakeholders implemented a wide range of activities to manage storm water, control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), address streambank erosion, improve habitat, and increase recreational opportunities throughout the watershed. During 2011, there were 27 Rouge River restoration projects funded under Round IX and X Rouge Project subgrants undertaken by watershed communities and agencies. Eleven Rouge Project funded river restoration projects were completed, with approximate total project costs of \$ 2,222,000. All projects met one or more of the goals of the Rouge River Watershed Management Plan and also helped address the requirements of a community's National Pollutant Discharge Elimination System (NPDES) stormwater permit or wastewater system NPDES permit. The variety of projects undertaken in 2011 reflects the varying needs of communities and actions taken to address Rouge River pollution at the source.

In addition to projects funded by Rouge Project Round IX and X subgrants, other watershed management activities and work to improve the Rouge River were implemented during 2011 by a variety of watershed stakeholders. Partnering with agencies and communities has expanded and leveraged the federal, state, local and private resources that will benefit the Rouge River and its watershed, and will help address Rouge River Watershed Management Plan goals. These efforts include:

- Several projects under the Great Lakes Restoration Initiative (GLRI), including:
  - Danvers Pond Dam Removal (grant to ARC),
  - Green Infrastructure project (grant to ARC),
  - Grants to Southeast Michigan Council of Governments (SEMCOG) for:
    - “Green Streets” projects in Wayne, Oakland and Macomb counties to install green infrastructure along county roadways, and
    - “Tree Enhancements on Publicly Owned Priority Urban Watershed” in Wayne and Oakland Counties,
  - Fordson Island Oxbow Restoration and Debris Removal Program (grant to Detroit/Wayne County Port Authority and Friends of the Rouge),
- Clean Michigan Initiative grant to the ARC for monitoring to support *E. coli* TMDL implementation in the Upper and Main 1-2 subwatersheds,
- Assistance to the ARC from the Statewide Public Advisory Committee (SPAC) to develop a template for the Upper Subwatershed to show projects that would work

toward delisting beneficial use impairments in the Rouge Area of Concern strategy to delist beneficial use impairments,

- U.S. Forest Service grant to ARC to plant 2,000 trees in the Rouge River Watershed, and
- U.S. EPA grant to Wayne County for toxics reduction in the Rouge River and Detroit River Areas of Concern via e-waste and household hazardous waste collections and targeted commercial/industrial facility inspections.

Watershed-wide activities implemented by Wayne County and the Alliance of Rouge Communities during 2011 to assist the overall effort to restore and protect the Rouge River included: water quality and ecosystem health monitoring and data analysis, illicit discharge investigations, numerous public education and involvement activities, ongoing management of a geographic information and data management system for the Rouge watershed, storm water management initiatives such as continued implementation of Green Infrastructure (Grow Zones) throughout the watershed, and overall management of the grants and coordination of efforts conducted by various stakeholders. Brief descriptions of these efforts are included in this report.

This Executive Summary provides highlights of 2011 Rouge River restoration efforts organized as follows: combined sewer overflow control, sanitary sewer overflow control, implementing the Michigan storm water general permit, public education, illicit discharge elimination, and watershed-wide cooperation and mutual support. Available water quality and ecosystem health improvement data are also summarized. Detailed descriptions of each activity are provided in this *2011 Progress Report*. All Rouge Project grant supported activities in 2011 were conducted under U.S. EPA Grant No. XP995743-09 (Rouge Project Grant 10).

### **Combined Sewer Overflow Control**

Controlling overflows of raw sewage from combined sewers and sanitary sewers remains a key priority in the effort to restore the Rouge River and has paid the largest and most obvious benefits. The CSO control program for the Rouge River is being implemented in three phases as established by NPDES permits:

- Phase I: eliminate raw sewage and the protection of public health for approximately 40 percent of the combined sewer area;
- Phase II: public health protection for the remaining combined sewer area; and
- Phase III: meet water quality standards in the Rouge River.

Implementation of Phase I is complete. Under Phase I, six communities separated their sewer systems, eight communities constructed 10 retention treatment basins (sized for different design storms; several employ innovative technology). One community, Dearborn, is now proceeding under a new 2010 NPDES permit to complete construction on five retention treatment shafts to serve two-thirds of its combined sewer service area and sewer separation in the remaining third. By the end of 2011, construction of three of the retention treatment shafts was completed and the facilities are operational. Sewer separation work is ongoing.

In other parts of the watershed, all 10 of the CSO retention/treatment basins originally planned under Phase I of the Rouge watershed CSO control program continued in operation during 2011 and are removing a significant source of untreated sewage overflow to the Rouge River. All of the 83 Phase I CSO outfalls are now under control (retention treatment basins) or have been eliminated (sewer separation).

During 2009, construction was halted for the Detroit Water and Sewerage Department's (DWSD) Upper Rouge Tunnel project for CSO control. DWSD developed a new plan for the remaining CSO outfalls known as "Alternative Rouge River CSO Control Program", available from the website [www.dwsd.org](http://www.dwsd.org). The new DWSD CSO Control Program encompasses \$814 million in new spending for CSO controls on the Rouge River, including a \$50 million investment in "green" projects starting in 2010 and \$764 million for conventional "grey" CSO control facilities. An example of a green project is the use bioswales and tree trenches along roadways and parking lots to intercept runoff and reduce stormwater inputs. Grey CSO control facility examples include modifying two Lower Rouge Outfalls to eliminate existing CSO discharges at the Carbon Outfall and the Fort St. East Outfall diversion to Oakwood Basin.

Considerable planning, design and construction work continued in other communities during 2011 to control or eliminate Phase II CSO outfalls in the Rouge watershed. As described in Section 3.1.2, the City of Dearborn CSO control project "West Village Restoration Project-Sewer Separation on West Village Drive from Mason, RXA-01", was completed in 2011 with the assistance of Rouge Project funding. Another City of Dearborn project "Sewer Separation Analysis for CSO Reduction at Outfalls 13 and 14, RXA-07" was ongoing through 2011 and will also control CSO discharges when completed. A description of these projects, their demonstration aspects and their status is in Section 5.5 Detailed Status Reports for Projects Active in 2011.

### **Sanitary Sewer Overflow Control**

Section 3.2 describes the four projects underway in 2011 to reduce and minimize SSOs to the Rouge River with Rouge Project provided grant funding assistance:

- Bloomfield Township, Investigate & Rehabilitate Sewers in Hickory Heights Separated Sanitary Sewer District, RXA-03;
- City of Rochester Hills, Rochester Hills Rouge District Sanitary Sewer Evaluation Study, RXA-02;
- City of Southfield Sanitary Sewer Investigation, RIXA-05; and
- North Huron Valley/Rouge Valley Sewer System Short Term Corrective Action Plan, RIXA-08.

All of these projects except the City of Southfield project were substantially completed in 2011. The largest of these projects was the construction of improvements to the North Huron Valley/Rouge Valley Sewer System under the Short Term Corrective Action Plan. This project was substantially complete in December 2011 and will have a major impact on the reduction of SSOs to the Rouge River. Inflow and infiltration (I/I) and surcharging within Wayne County's 93-mile sewer system were reduced through rehabilitation of 1,013 manholes, sewer lining of 10,197 linear feet of sanitary interceptors (ranging in size from 48

to 102 inches in diameter), 17 spot repairs and 167 joint repairs of the sewer interceptors, cleaning of six siphons (1,616 linear feet) and upgrades to the Lift Station 1A located at the intersection of Ford Road and Hines Drive.



Before and After, Sewer Lining, Short Term Corrective Action Plan,  
Rouge Valley Sewage Disposal System (*Photos courtesy Wayne County*)

### **Implementing the Michigan Storm Water General Permit**

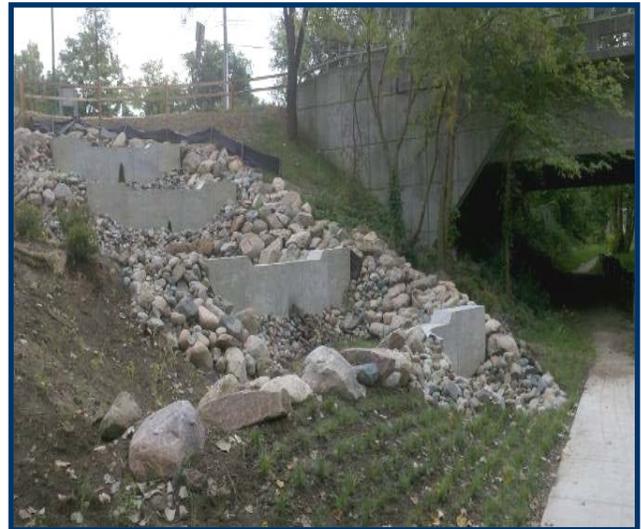
One measure of success of the Rouge Project is the issuance by the State of Michigan of a watershed-based NPDES permit based on the voluntary watershed-based permit developed under the Rouge Project in 1998. The benefit of the watershed-based permit is that it brings communities together in a voluntary approach to cost effectively manage storm water for the protection of the river water quality and ecosystem. The Michigan Storm Water General Watershed-based Permit requires each community to implement a public education plan, watershed management plan and an Illicit Discharge Elimination Program (IDEP). Grant funds from the Rouge Project supported many of these activities during 2011. Sections 3.3, 3.4, and 5 of this 2011 Progress Report highlight the activities undertaken in each of these areas. Section 7 presents work completed by the ARC to implement the Michigan Storm Water General Watershed-based Permit.

Twenty-one projects for stormwater and watershed management were funded in 2011 for Stormwater Compliance Activities under Rouge Project Grant 10. Nine stormwater and Rouge watershed management projects were completed during in 2011 with Rouge Project funding assistance:

- Canton Township, Lower Rouge Recreational Trail and Bridges, RIXB-03. This project continued ongoing efforts to complement the Lower Rouge River Trail by constructing a 0.50 mile trail link including installation of two footbridges over the Lower Rouge River between Sheldon Road, where the current trail ends, and Canton Center Road.
- Canton Township, Pheasant Run Golf Club Detention Basins Enhancements, RIXB-04. Three existing detention ponds in the Canton Township-owned Pheasant Run

Golf Course were retrofit and enhanced under this project to provide improved stormwater management and ecological benefits.

- Cranbrook Educational Community, 2010 Rouge River Water Festival at Cranbrook, RXB-02. This subgrant provided funding assistance to plan and present the 2010 Rouge River Water Festival at Cranbrook and to take Rouge River Watershed educational materials and curriculum as part of the *Water on the Go!* Program that presents watershed-related issues to elementary and middle schools around the state of Michigan.
- Friends of the Rouge, Public Education and Involvement Projects-Round IX, RIXB-07. This two-year project continued the Rouge Education Project, Rouge Rescue, River Restoration Project and Frog and Toad Survey programs which assist with Rouge River restoration.
- Oakland County Water Resources Commissioner's Office, Rouge Oakland Public Service Announcements – 2011, RXB-07. Public service announcements on television and radio were broadcast to educate the public about storm water management, including awareness of storm drains and how local waterways are connected to the Great Lakes.
- Randolph Street Inter-County Drain Drainage District, Randolph Street Drain Streambank Restoration, RIXB-13. This project utilized innovative design methods for stabilizing four segments of the Randolph Street Drain, a waterway that flows into the Rouge River.
- City of Southfield, Beech Woods Greening Project, Phase I-North Parking Area, RXB-11 and City of Southfield, Beech Woods Greening Project II, RXB-17. This project constructed a bioswale and replaced a portion of the parking lot at the City of Southfield's Beech Woods Park with pervious pavement; these retrofit features treat storm water runoff and reduce storm water runoff volumes to minimize soil erosion and sedimentation in the Rouge River.
- City of Southfield, Valley Woods Trail Head and Storm Water Improvements, RXB-12. This project created an attractive and functional storm water structure as a component of a new park entrance for Valley Woods Nature Preserve. An inadequate drainage structure was replaced with a visually attractive drainage feature which incorporated a new public entranceway for an existing river trail. The design integrated native plantings and innovative water conveyance methods. It has improved aesthetics, water quality, public safety, and promoted the public use and enjoyment of the river corridor.



Installation of native vegetation in new storm water feature, Valley Woods Nature Preserve  
*Photo courtesy of City of Southfield*

There were twelve additional Rouge Project grant funded storm water / watershed management projects ongoing at the end of 2011, including:

- Main 1-2 Subwatershed
  - City of Birmingham, Main Rouge River Restoration and Hill Slope Stabilization, RXB-08
- Main 3-4 Subwatershed
  - Henry Ford Community College, Green Roof and Rain Garden, Science Building Addition, RXB-19
- Lower 1 Subwatershed
  - Canton Township, Michigan Avenue Bio-Swale and Native Planting Project, RXB-03
  - Canton Township, Lower Rouge River Log Jam Inventory and Maintenance Project, RXB-05
- Lower 2 Subwatershed
  - Alliance of Rouge Communities, Wayne Road Dam Removal Project: Design Phase, RXB-20
- Middle 1 Subwatershed
  - Northville Township, Northville Bennett Arboretum Pathway Project, RXB-01
  - City of Novi, Regional Basin Retrofits for Water Quality Improvement, RXB-13
- Upper Subwatershed
  - City of Livonia, Bell Branch Streambank Stabilization, RXB-14
  - City of Livonia, Whispering Willows Storm Water Detention Basin, RXB-15

A description of these projects, their demonstration aspects and their status is in Section 5.5 Detailed Status Reports for Projects Active in 2011. Highlighted here is the Northville Township, Northville Bennett Arboretum Pathway Project, RXB-01, a new 1800 foot long

pathway providing one of the only connections from the City of Northville and Northville Township to segments of the Johnson Creek and the Rouge River. The pathway intersects with existing meandering foot trails and provides enhanced benefits of education and protective access to the Johnson Creek. Portions of the pathway are protected on either side by block retaining walls with integral plantings of native materials. This project allows residents to visually see how to reduce runoff and protect the watershed with the use of native plants, pervious pavement/concrete, and tree canopy/root infiltration. The bridge over the Johnson Creek allows for both the unique prospective on the character of the river and its immediate environment as well as a platform for accessing educational information about the Creek, such as water quality, temperature, biology, plant and fish or mammal habitat. This path system provides access for area residents to fishing, watershed educational information and provides passive recreational opportunities.



Northville Bennett Arboretum Pathway Project  
*Photo courtesy of Northville Township*

## **Public Education and Involvement**

In 2011, Rouge Project grant funds supported activities to educate and involve the public in the Rouge River restoration including efforts by the Friends of the Rouge (FOTR), University of Michigan-Dearborn, Cranbrook Institute of Science, Oakland County Water Resources Commissioner (OCWRC), Alliance of Rouge Communities (ARC), Southeastern Oakland County Water Authority (SOCWA), and Wayne County.

Friends of the Rouge. The Rouge Project subgrant “FOTR Public Education and Involvement Projects (RXB-12)” and funding from the Alliance of Rouge Communities provided a variety of educational programs to support Rouge Watershed communities' public education plans required under the Storm Water Permit for each watershed community. Programs offered during 2011 were the Rouge Education Program (REP), Rouge Rescue and Planting Projects, and Frog and Toad Survey. Highlights of these programs include:

- Rouge Education Project. Over 3000 students from 37 schools participated in 2010-2011 academic year in this hands-on learning project.
- Rouge Rescue focuses on cleaning up debris in and around the Rouge River, woody debris management and also includes efforts to stabilize eroding streambanks with woody debris and vegetation, planting rain gardens that use storm water as a resource, maintaining trails along the river, and a variety of other activities that focus on river restoration. Rouge Rescue 2011 attracted 1,550 volunteers who worked at 39 sites in 25 communities to clean trash from the Rouge River, plant native vegetation to restore the land/water connection and remove invasive plants to maintain biodiversity in the river's corridor.
  - In 2011, Rouge Rescue celebrated it's 25th anniversary, and highlights from 25 years of Rouge Rescue include:
    - Volunteer participation: 49,601
    - Worksites: 696
    - Cubic yards of trash/debris removed: 46,300
    - Vehicles removed: 61
    - Cubic yards of invasive plants removed (since 2002): 492

A major activity for FOTR during 2011 was coordinating the removal of abandoned boats in the Rouge River oxbow around Fordson Island. In partnership with the Detroit/Wayne County Port Authority and Southwest Detroit Environmental Vision, and with grant funding from the Great Lakes restoration initiative, 20 abandoned boats were removed in spring and summer 2011 with the assistance of Faust Corp, Marine Pollution Control and Waste Management.



Abandoned Boat Removal, Rouge River at Fordson Island Oxbow  
*Photo courtesy Friends of the Rouge*

Rouge River Water Festivals are an interactive annual learning event for adults and students in the watershed. The University of Michigan-Dearborn (Wayne County) and the Cranbrook Institute (Oakland County) each held a Rouge River Water Festival in the spring and fall of 2011, respectively. At the University of Michigan-Dearborn, over 3,000 children attended presentations and exhibits at these festivals on a wide range of water related issues including municipal, agricultural, and industrial uses in addition to the hydrologic cycle, which includes weather, waste water treatment, soil erosion, wetlands, and wildlife. The 2011 Water Festival at Cranbrook Institute of Science reached more than 2,220 fourth and fifth grade students.

Efforts by Southeastern Oakland County Water Authority to promote Rouge-friendly lawns and landscapes in the watershed continued during 2011 under the Rouge Project subgrant “Rouge Friendly Lawns and Landscapes (RXB-09)”. Activities included demonstration projects, public information materials, website updates and public seminars. This project was a multi-faceted public education program implemented by SOCWA contractors in cooperation with the Healthy Lawns and Gardens Technical Advisory Committee, retailers, agency partners, Oakland County MSU Extension, and SOCWA volunteers. Programs included promotion of Rouge-friendly lawns and landscapes through demonstration projects, public information materials, website updates, and public seminars; volunteer projects such as assistance with public workshops, demonstration gardens, education programs in the schools, tabletop displays, and others; projects with local retailers, including programs such as the “Don’t Guess...Soil Test” publicity, earth-friendly lawn fertilizer stickers, and healthy landscape tip cards.

The Oakland County Water Resources Commissioner (OCWRC) partners with a wide variety of stakeholders to provide public education. OCWRC public education activities during 2011 includes riparian education, Oakland Lakefront Magazine advertisements, Kids’ Clean Water Calendar Contest, Dirt Doctors program, Drain Detectives program, Enviroscope Watershed Model program, and broadcast of public service announcements (PSAs) on television and radio and inserted messages in printed publications. The topics of the PSAs were storm drain awareness and how our local waterways are connected to the Great Lakes.

ARC Public Education Activities. As described in Section 7, the ARC Public Involvement and Education (PIE) Committee completed numerous activities during 2011 to educate and involve the public in storm water management. A major initiative of the ARC was to encourage implementation of Green Infrastructure (Grow Zones) throughout the watershed. At five rain barrel sales events held in 2011, there were 1,688 rain barrels and 114 compost bins sold. The ARC distributed 2,600 seedlings for planting at numerous events, along with pollution prevention literature. New educational material developed during 2011 included the fertilizer clips shown here, a flyer to educate the general public about the ARC and its activities, and an ARC bookmark.



ARC Fertilizer Clip:  
**Fertilize Sparingly and Caringly**  
*Photo courtesy ECT*

Wayne County Public Education Activities. Wayne County completed numerous activities during 2011 to educate and involve the public in the Rouge River restoration effort, in partnership with the ARC, SEMCOG, and others. For example, in cooperation with the ARC, Wayne County provided 8,000 pieces of public information materials and information relating to water pollution issues to watershed communities for their use. One hundred forty-one schools were recognized as Wayne County Green Schools in 2011. The numerous workshops to educate various stakeholders on a variety of topics related to managing storm water and protecting the environment co-sponsored by Wayne County in 2011 included the fifth annual Native Plant Workday in Bennett Arboretum and the sixth annual Wayne County / Ford Motor Company grow zone maintenance days in Hines Park.

In addition to efforts to educate and involve watershed stakeholders in the Rouge River restoration activities, Wayne County continued to convey “lessons learned”, technical and other Rouge Project information to the appropriate national, state, and local forums during 2011. The Rouge Project website [www.rougeriver.com](http://www.rougeriver.com) continues to be a significant source of information and education about the Rouge River, its watershed, and the efforts to restore and protect these resources. During 2011, the Rouge Project website experienced over 1.5 million hits from citizens, students, university staff, businesses, community groups, municipalities, and others interested in obtaining information on the Rouge River and the Rouge River National Wet Weather Demonstration Project. In addition, Rouge Project staff gave several presentations, published papers, and hosted site visits for local, regional and national audiences during 2011.

### **Illicit Discharge Elimination**

Watershed communities and counties devote considerable resources each year to eliminating illicit discharges to the Rouge River. This watershed management activity is required under storm water permits issued to watershed communities, but more importantly, this activity results in the identification and elimination of numerous improper discharges of sewage to the river each year.

Wayne County’s illicit discharge elimination activities in 2011 included investigating illicit discharges and providing illicit discharge elimination training for other communities. In 2011, eight-nine people completed Wayne County’s *Combined Basic/Advanced IDEP Training* offered during two workshops. Approximately 228 complaints or inquiries involving land or water pollution concerns were handled through the Wayne County Environmental Hotline (888-223-2363), with two illicit discharges identified through Wayne County investigation of these complaints. Wayne County also inspected 100 facilities in the Rouge River watershed, including dye-testing of plumbing fixtures, to identify improper connections of sanitary sewers to the storm sewer system/waterways. Wayne County and local communities partnered on several IDEP investigations. For example, Wayne County and the City of Inkster conducted an investigation of suspicious sewer taps discovered during sewer televising in a residential area, and Wayne County investigated a report of discolored discharges from several outfalls identified by FOTR volunteers and staff during their Lower Rouge exploratory canoe trip. Wayne County’s illicit discharge elimination efforts in 2011 alone will prevent over 50,000 pounds of pollutants and approximately 6.6 million gallons of polluted water per year from entering Wayne County waterways. These pollutant loading

reduction estimates include illicit discharges identified during all 2011 Wayne County illicit discharge investigations.

Oakland County's 2011 IDEP activities included investigating water pollution complaints reported through the 24-hour Pollution Hotline (248-858-0931). In 2011, Oakland County received 27 such complaints, and investigation of these complaints resulted in the identification and elimination of 14 illicit discharge sources. Oakland County also conducted stormwater discharge point surveys and follow-up investigations to locate and eliminate pollution from waterways during 2011. These surveys resulted in identification and elimination of eight additional illicit discharge sources.

The on-site sewage disposal inspection programs initiated with funding under the Rouge Project grants are being continued by Oakland, Washtenaw and Wayne Counties. In Oakland County, the Health Department (OCHD) issued 470 on-site sewage disposal system (OSDS) permits for the FY 2011. The OCHD completed 378 OSDS failure evaluations in FY 2011 and conducted 75 septage vehicle inspections of both new haulers and existing vehicles and 2 septage receiving station inspections. In Wayne County, the Department of Public Health, Environmental Health Division conducted 121 "time of sale" and 11 additional evaluations of onsite sewage disposal systems during 2011. Fifty-seven of these systems were identified as failing. Thirty-three failing systems were repaired in 2011. Since program inception in February 2000 through December 2011, 1,684 OSDS have been inspected under the "time of sale" provision of the ordinance, with 360 OSDS identified as failing. Additionally, a total of 49 new and repaired OSDS were permitted and installed in Wayne County in 2011. Educational materials about proper maintenance of OSDS are distributed to homeowners at the time of permit issuance. Twenty-four inspectors were certified to perform OSDS "time of sale" evaluations in Wayne County during 2011.

## **Watershed Wide Cooperation**

### **Alliance of Rouge Communities**

The Alliance of Rouge Communities (ARC) completed its sixth full year of operation in 2011. The Alliance of Rouge Communities (ARC), a 501(c)(3) organization, is a voluntary public watershed entity currently comprised of 35 municipal governments (i.e. cities, townships and villages), three counties (Wayne, Oakland and Washtenaw), Henry Ford Community College, University of Michigan-Dearborn 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. and Current ARC cooperating partners are Cranbrook Institute of Science, Friends of the Rouge, Rouge RAP Advisory Council, Southeastern Oakland County Water Authority, and Wayne State University.

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 day-to-day operations of the ARC are performed through a group of standing committees. These committees include the Technical Committee, Public Involvement and Education Committee, Organizational

Committee, Finance Committee, and Executive Committee. The ARC web site, [www.allianceofrougecommunities.com](http://www.allianceofrougecommunities.com), provides information about ARC activities to its members and to other interested Rouge watershed stakeholders. Activities and actions undertaken by the ARC in 2011 are detailed in Section 7 and Appendix A of this 2011 Progress Report and include:

- Rouge River water quality monitoring continued in 2011 to assess progress toward the goals in the Rouge River Watershed Management Plan. Flow and dissolved oxygen monitoring was completed at site U05 on the Upper Branch. Data for 2011 and prior year are available from the Watershed Monitoring Database Query Tool at [www.allianceofrougecommunities.org](http://www.allianceofrougecommunities.org). The 2010 Rouge River Ecosystem Monitoring and Assessment Report was also completed during 2011.
- ARC staff continued to refine the web-based Rouge River Storm Water Reporting System initiated in 2009. The system offers ARC members a web-based mechanism for Phase II permit reporting to the Michigan Department of Environmental Quality. The Online Storm Water Reporting System is a step towards having one ARC storm water report for the MDEQ, which will ease the burden on both community and MDEQ staff. The reporting system allows for comments on each entry and for back-up files to the uploaded report, which will be beneficial during an audit. Reporting will be available on an individual member basis and on a watershedwide basis.
- ARC staff worked throughout the 2011 budget year to pursue federal and local grants. Applications for the following grants were submitted during 2011 on behalf of the Alliance of Rouge Communities:
  - NOAA Fish and Wildlife Habitat Grant for the Wayne Road Dam Removal project (\$1 Million). The ARC was awarded this grant and work began in Fall, 2011.
  - CMI Monitoring Grant (\$49,895) for monitoring to support *E. coli* TMDL implementation in the Upper and Main 1 - 2 Subwatersheds. The ARC was awarded this grant and work began in Fall, 2011.
  - Great Lakes Restoration Initiative Grant to create schoolyard habitat (grow zones) in schools in the Rouge AOC. This grant was not awarded.
  - Statewide Public Advisory Council Grant through the Great Lakes Commission (\$24,989) to create a template for the Upper Subwatershed to show projects that would work toward delisting beneficial use impairments in the Rouge Area of Concern. Work began on this grant in June, 2011.
  - U.S. Forest Service Emerald Ash Borer Grant (\$374,980) to plant 2,000 trees in the Rouge River Watershed. This grant was awarded to the ARC, but did not begin in 2011.
- During 2011, the ARC also continued work on two grants from the Great Lakes Restoration Initiative received in 2010, Danvers Pond Dam Removal in Farmington Hills and Rouge Green Infrastructure projects in Southfield, Detroit Parks and Wayne County Parks. Work also continued during 2011 on a 2010 grant from the Statewide Public Advisory Committee (SPAC) to develop a delisting strategy for the Rouge River Area of Concern (AOC), and on a Rouge Project Round X subgrant.

## **Water Quality and Ecosystem Health Improvements**

During 2011, Rouge River water quality and ecosystem health continued to improve. Section 2 of this 2011 Progress Report provides detailed information for the summary presented below and shown in the table “Analysis of Rouge River Conditions” (excerpted from Section 2) shown on the next page. Rouge River water quality data summarized in this report were collected in 2010. Ecosystem health data were collected in 2011.

### **Water Quality**

One of the primary measures to assess progress toward fully restoring the Rouge is the amount of dissolved oxygen in the river water. Low oxygen levels means the river can't support fish and other aquatic life. The Rouge Project has been monitoring dissolved oxygen (DO) at various locations in the river since 1994. Analysis of DO data collected through 2010 showed an upward trend...there is more oxygen in the Rouge River each year. In general, DO and temperature are in compliance with minimum waters quality standards on a routine basis throughout the watershed and have remained fairly stable at most locations. Further improvement is expected as the remaining combined sewer overflows, located primarily in Dearborn and Detroit, are controlled.

Another indicator of progress is how much *E.coli* bacteria are in the river. *E. coli* are an indicator of sewage. Comparison of instream samples for *E. coli* at several locations in the Middle Rouge collected during 2010 with previously collected data shows that the percentage of *E. coli* samples with concentrations less than State standard for body contact (300 cfu/100ml) have been improving each year in both dry and wet weather.

Excessive peak flows in the river system are a major challenge for complete restoration of the Rouge River. Excess peak flows cause streambanks to collapse, which take trees and backyards with them, and adds silt to the river, which can wash out or silt over habitat for a variety of things ranging from bugs that fish eat, to the fish, to the mammals that eat the fish. Flow data collected for the four main branches of the Rouge through 2010 show that peak flows have been decreasing in the Upper and upper Main Rouge Rivers and in some cases, are becoming fairly stable. Flow data for the Lower and Middle Rouge Rivers show that the frequency of peak flows continued to be high during 2010 but was not increasing. In addition, low flows at some locations are becoming higher which is important to maintain aquatic life during hot dry days. These results indicate that the efforts to manage storm water flows across the Rouge River watershed are working.

In addition, for the past five years, Wayne County has collaborated with FOTR, MDEQ and volunteers to test a new and cheaper way of measuring if peak flows in the river are increasing or decreasing. The procedure is called geomorphology assessments and consists of relating size of pebbles observed at specific river cross sections to estimated stream discharge forces at that point. The data provide a short-term rapid assessment of site specific streambank restoration needs, and an indication of long-term stream stability. In 2011, Wayne County completed geomorphology surveys at two Rouge River sites located in the Middle Rouge River watershed and previously surveyed in 2010. The tractive force ratio, which estimates stability of a stream based on a ratio calculated from the bankfull depth, channel slope and the size of particles found on the stream bed, was calculated for the sites.

## Analysis of Rouge River Conditions

Developed from *Rouge River Ecosystem Monitoring and Assessment Reports*

| Parameter                             | Rouge Subwatershed |                 |       |             |             |            |                 |
|---------------------------------------|--------------------|-----------------|-------|-------------|-------------|------------|-----------------|
|                                       | Main<br>1/2        | Main<br>3/4     | Upper | Middle<br>1 | Middle<br>3 | Lower<br>1 | Lower<br>2      |
| <b>Stream Flow<sup>1</sup></b>        | ↑                  | ↔               | ↑     | ↔           | ↔           | ↔          | ↔               |
| <b>Temperature<sup>2</sup></b>        | ↑                  | ↑               | ↑     | ↑           | ↑           | ↑          | ↑               |
| <b>Dissolved Oxygen<sup>3</sup></b>   | ↑                  | ↑               | ↑     | ↔           | ↑           | ↓          | ↑               |
| <b>Total Phosphorus<sup>4</sup></b>   | ↔                  | ↔               | ↔     | ↔           | ↑           | ↑          | ↑               |
| <b>E.coli<sup>5</sup></b>             | ↔                  | ↔               | ↔     | ↔           | ↑           | ↔          | ↔               |
| <b>Fish Community<sup>6</sup></b>     | ↔                  | NA <sup>7</sup> | ↑     | ↓           | ↓           | ↔          | NA <sup>7</sup> |
| <b>Habitat<sup>8</sup></b>            | ↔                  | NA <sup>7</sup> | ↔     | ↔           | ↔           | ↑          | ↔               |
| <b>Macroinvertebrates<sup>9</sup></b> | ↑                  | NA <sup>7</sup> | ↓     | ↑           | ↑           | ↔          | ↔               |
| <b>Frogs &amp; Toads<sup>10</sup></b> | ↔<br>5-6           | ↑<br>5-6        | ↑ 7-8 | ↑ 7-8       | ↔<br>3-4    | ↑ 7-8      | ↑<br>5-6        |

- 1) Trend arrow is based on frequency of peak flow decreasing as reported in *2010 Rouge River Ecosystem Monitoring and Assessment Report*.
- 2) Michigan water quality standards for temperature, developed to protect warm water fisheries are established only for streams receiving heated effluents with 29.4°C being the maximum temperature allowed during any month. Up arrow indicates continuous temperature monitoring did not exceed this value as reported in *2007 Rouge River Ecosystem Monitoring and Assessment Report*.
- 3) Arrow is based on daily average DO trend analysis as reported in *2010 Rouge River Ecosystem Monitoring and Assessment Report* of the most downstream monitoring station
- 4) Arrow is based on Total Phosphorus trend analysis as reported in *2007 Rouge River Ecosystem Monitoring and Assessment Report*.
- 5) Arrow is based on the majority of sampling points having an improving trend as reported in *2007 Rouge River Ecosystem Monitoring and Assessment Report*.
- 6) Trend arrow is based on comparing reported MDNR 1995 fish community survey results to MDEQ 2005 fish community survey results as reported.
- 7) Not Applicable - Lack of data to perform trend assessment.
- 8) Trend arrow was established by comparing MDEQ 2000 study ratings with MDEQ 2005 study ratings.
- 9) Arrow was established based on Friends of the Rouge and Wayne County macroinvertebrate monitoring trend analysis spring and fall 2001 – 2011. Arrows reflect a significant trend in either spring or fall data. **Bold arrows** reflect a significant trend in both spring and fall.
- 10) Arrow indicates either an increase or decrease in number of species heard in the watershed from the prior year or minimum 7-8 species heard in the watershed during Friends of the Rouge annual Frog & Toad Survey.

Based on the rating scale that Wayne County has proposed, the tractive force ratio was stable for Lilley Road and changed slightly toward aggrading at the Plymouth Township Park site.

### **Ecosystem Health**

Rouge River ecosystem health is evaluated by observing the number and variety of clams, snails, aquatic insects and other creatures that live in the streambed. “Bug hunts” were completed during the spring (47 sites) and fall (52 sites) of 2011 by FOTR and Wayne County. Notable Rouge River watershed macroinvertebrate findings during 2011 include:

- In the spring 2011, a new family of caddis fly (Family Lepidostomatidae), a sensitive family typically found in small cool streams and who are indicators of clean water, was found for the first time in Johnson Creek
- Family Lestidae, spread winged dragonflies, are a tolerant type of dragonfly, but new to the Rouge River, were found this spring in the Lower Rouge Fellows Creek tributary. Six sensitive families were found at seven sites: Stoneflies (Families Nemouridae, Perlodidae, Capniidae) Pronggill mayflies (Family Leptophlebiidae), free living caddis flies (Family Rhyacophilidae) and Lepidostomatid caddis flies (Family Lepidostomatidae).
- Clubtail dragonflies, a member of the dragonfly family Gomphidae which is very sensitive to water quality, were found at on the Main Rouge (Firefighters Park) in Troy during the Fall 2011 bug hunt. Also collected during the fall 2011 bug hunt were a Dobsonfly, or Hellgrammite, was also found on Danvers Pond on Pebble Creek, a Main Rouge Tributary. The Dobsonfly is a member of the family Corydalidae, also very sensitive to water quality.
- Pronggill mayflies, another insect family sensitive to water quality, were found at four Johnson Creek sites in fall 2011. Perlodid stoneflies (Family Perlodidae), a water quality-sensitive family were also collected at a Johnson Creek site this fall.

A trend analysis was performed on the Rouge River benthic macroinvertebrate data collected 2001 - 2011. Based on this analysis, three of eight subwatersheds are showing significant improving trends for spring macroinvertebrate monitoring data. Three of eight subwatersheds have significant improving data trends for fall monitoring. One of the subwatersheds (Upper Rouge) had a significant declining data trend in both spring and fall 2011.

The Rouge River Watershed Frog and Toad Survey, a volunteer listening survey that has been coordinated by Friends of the Rouge since 1998, continued during 2011. Volunteers are trained to recognize local frog and toad breeding calls and survey quarter-square-mile blocks within the Rouge River watershed from March through July. The purpose of the survey is to collect baseline data on the distribution of frogs and toads within the watershed as well as to give residents of an urbanizing area a positive experience with their local natural areas.

Overall 2011 was a fairly average year for frogs and toads in the Rouge Watershed. Five of the eight species found in the Rouge had averages that were less than observed in 2010. Bullfrogs and Northern Leopard Frogs were heard in the same number of blocks as 2010 and Spring Peepers were the only species to see an increase in their average from last year’s survey. Compared to the overall average, Western Chorus Frogs and Spring Peepers were

heard in fewer blocks while Wood frogs, American Toads, Northern Leopard Frogs, Gray Treefrogs, Green Frogs and Bullfrogs were heard in a higher percentage of blocks than average. The American Toad was the most commonly heard frog or toad as it has been since 2001. Heard in 80% of all blocks, the American Toad was heard in a lower percentage of survey blocks than last year but more than the overall average.

### **Summary**

Projects and activities throughout the watershed to restore and protect the Rouge River have made a difference. Substantial progress has been made using any number of indicators such as reduced sewage discharges, increased dissolved oxygen throughout the river, and increased usage of the river by people and wildlife. New partners are joining the efforts to restore the Rouge every day, from residents to businesses to non-profit educational institutions and public organizations throughout the watershed. The Alliance of Rouge Communities provides the framework and leadership to sustain the 20-year Rouge River restoration effort into the future.

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