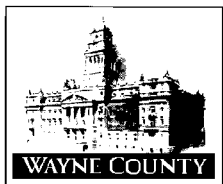
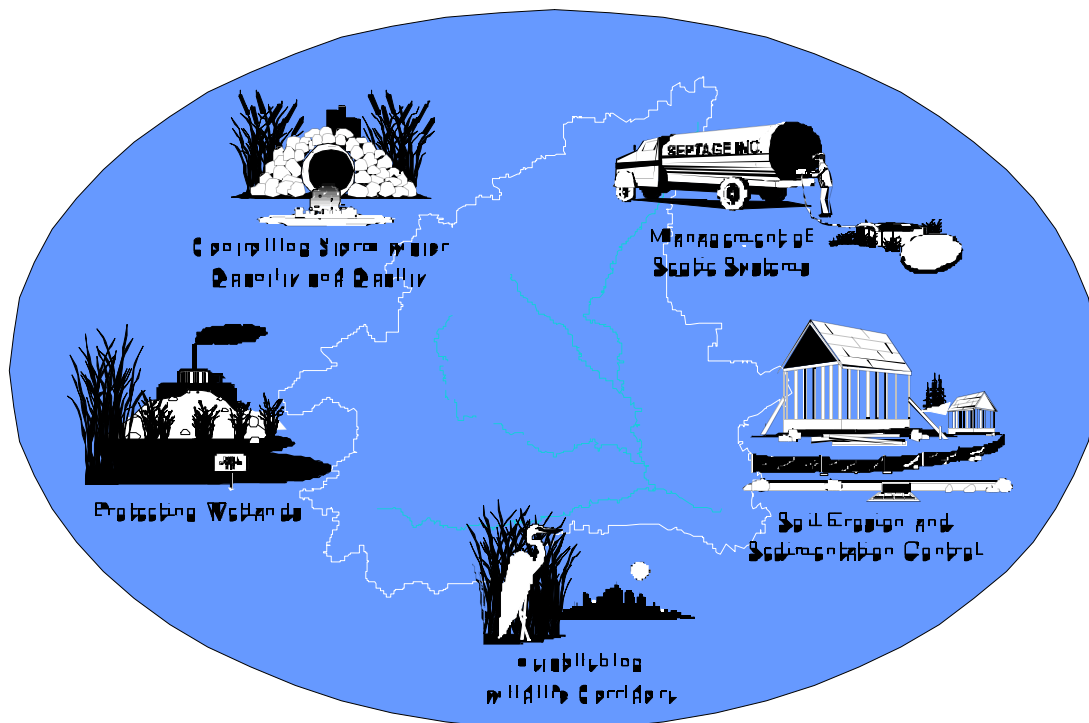


# IMPROVING COMMUNITY STORM WATER MANAGEMENT

## A Summary Guide of Ordinances For Rouge River Communities

RPO-NPS-SR17.00



**ROUGE RIVER NATIONAL  
WET WEATHER DEMONSTRATION PROJECT**  
220 Bagley Avenue, Suite 920  
Detroit, Michigan 48226

THE ROUGE RIVER PROJECT  
A WORLD CLASS EFFORT



BRINGING OUR RIVER BACK TO LIFE

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency grant X995743-02.

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## 1.0 INTRODUCTION

One goal of the Rouge River National Wet Weather Demonstration Project is to provide communities with guidelines for public education and involvement that will encourage stewardship of our water resources. The Rouge River is one of the most publicly accessible rivers in the state; therefore, it is important to restore and preserve the quality of its surface water and groundwater. There is an opportunity for communities in the Rouge watershed to lead in this restoration effort. The purpose of this document is to suggest various ordinance provisions that can be used to create a local ordinance, or a series of ordinances, that will have the effect of reducing the adverse impacts of storm water runoff in-stream water quality.

The goals of a storm water ordinance are to:

1. Prohibit illicit sanitary connections and to control the discharge of contaminated storm water runoff from residential, industrial, commercial, and construction sites into storm sewer systems and natural waters;
2. Provide guidance in the application of fertilizers, pesticides, and herbicides; and to promote public awareness of the improper dumping of hazardous substances, household hazardous waste, industrial wastes, and other contaminants;
3. Encourage Best Management Practices (B.M.P.'s), recycling, and safe disposal of hazardous products;
4. Require owners and operators of industrial and construction sites to maintain compliance with state and federal standards and permits;
5. Enable municipalities to comply with federal and state laws and regulations applicable to storm water discharges.

This guideline is intended to aid communities in creating a comprehensive local ordinance, or a series of ordinances, to reduce the adverse effects of common human activities on our water resources. In an effort to establish the baseline, a stormwater management practice checklist was prepared (Table 1-1). Once this information has been collected and reviewed, the applicable standards and practices (Table 1-2) can be used to compare a community's existing practices to both the RPO Model Ordinance and the practices of other communities (Table 1-3). This cursory comparison should help in prioritizing which ordinances must be enhanced or enacted. The guideline consists of seven areas of developing a storm water ordinance. Each section is concluded with a list of communities which currently have storm water ordinances and a few representative ordinances as examples for cursory comparison. These ordinances are not necessarily optimal but are presented to all communities as a point of reference. Also provided are Appendices which include National Model Ordinances, EPA Regulations, and Resources.

**Table 1-1. Storm Water Management Practice Checklist**

Storm Water- Management Practice		Responsible Agency/ Community	Contact Person	Frequency	Applicable Standard	Improvement Needed
Maintenance for Roads & Public Areas		Municipal (Public) Lawns & Gardens				
	Roads					
	Parks					
	Golf Courses					
Snow & Ice Treatment		Salt				
	Sand					
Street Sweeping Frequency						
Leaf Collection Yard Waste						
Hazardous Waste Collection						
Catch Basin Collection System Maintenance	Catch Basins					
	Collection Syst. Maintenance					
Soil Erosion/Sedimentation Control Program						
Managing Septic Systems	Septage Disposal					
	Septic System Maintenance					
Protecting Wetlands						
Maintaining Vegetative Buffer Zones & Stabilizing Streambanks						
Floodplain/Watercourse: Maintaining Docks & Water Related Structures						
Establishing Wildlife Corridors						

This checklist is intended to provide a community a starting point by which they can evaluate the effectiveness of their existing operations to other Southeast Michigan communities and the RPO Model Ordinance and determine if operational or ordinance changes are warranted.

**Table 1-2. Areas of Model Stormwater Ordinance**

	LOCAL	NATIONAL	EPA - Regulations	OTHERS - Road & Drain Commissioner, MDNR
Controlling Storm Water Quantity & Quality	X	X	X	X
Soil Erosion & Sedimentation Control	X	X		X
Managing Septic Systems	X	X	X	X
Protecting Wetlands	X	X	X	X
Maintaining Vegetative Buffers & Stabilizing Streambanks	X	X		X
Floodplain/Watercourse & Water Dependent Structures	X	X	X	X
Establishing Wildlife Corridors	X	X		X

Source: Local Ordinance, A Users Guide by the Terrene Institute

**Table 1-3. Selected Examples of Existing Local Ordinances Within the Rouge River Watershed**

Controlling Storm Water Quantity & Quality	Soil Erosion & Sedimentation Control	Managing Septic Systems	Protecting Wetlands	Maintaining Vegetative Buffers	Floodplain/Watercourse	Protecting Woodlands
Canton	Dearborn	Commerce Twp.	Auburn Hills	Canton	Allen Park	Novi
Dearborn Hts.	Garden City	Garden City	Bloomfield Twp.	Southfield	Birmingham	Rochester Hills
Lathrup Village	Livonia	Farmington Hills	Canton	West Bloomfield	Detroit	Southfield
Novi	Lyon Twp.	Northville	Franklin Village		Inkster	Troy
River Rouge	Northville	Novi	Oakland Twp.		Plymouth Twp.	Wixom
Southfield	Romulus	West Bloomfield	Rochester Hills		Pontiac	
	Westland		Southfield		River Rouge	
			Wixom		West Bloomfield Twp.	

Source: RPO - Rouge River Watershed Model Storm Water Ordinance

In an effort to establish the baseline, a storm water management practice checklist was prepared (Table 1-1). Once this information has been collected and reviewed, the applicable standards and practices (Table 1-2) can be used to compare a community's existing practices to both the RPO Model Ordinance and the practices of other communities (Table 1-3).

## **2.0 DEVELOPMENT OF A STORM WATER ORDINANCE**

A key to developing an effective storm water control program is to shape the various aspects of daily life which impact storm water quality in a manner that assures an appropriate party is diligent in protecting the resource. Many of the major impactors are best handled by the local unit of government or the county (roads, county drains, detention/retention basin maintenance and discharge controls, parks, snow/ice treatment, street sweeping, catch basin maintenance, etc.). Others are best handled as property is developed (storm water control, detention/retention basins, greenspace, vegetative buffers, trees, etc.). Still others have not historically been the purview of the government or the developer (septic field maintenance). An important step toward the establishment of a comprehensive storm water control program is to review the existing local ordinances and determine if gaps exist in the regulation and control of storm water.

The areas which are easiest to implement are associated with preventative measures prior to development, and are also the least costly to the municipalities. Some of the major changes that new development brings include the need for:

- ✓Controlling Storm Water Quantity & Quality
- ✓Soil Erosion & Sedimentation Control
- ✓Managing Septic Systems
- ✓Protecting Wetlands
- ✓Maintaining Vegetative Buffer Zones & Stabilizing Streambanks
- ✓Floodplain/Watercourse: Maintaining Docks and Other Water Dependent Structures
- ✓Establishing Wildlife Corridors

The following sections summarize how each of these issues can be addressed:

### **2.1 CONTROLLING STORM WATER QUANTITY & QUALITY**

Rapid and effective removal of storm water runoff was not found in many cities in the early nineteenth century. Today, however, urban drainage facilities have improved from crude ditches (draining pervious unpaved areas) to effective systems of storm drains, curbs, gutters, and storm sewer pipes (draining impervious surfaces such as paved surfaces and rooftops). Because of this, controlling storm water runoff is difficult especially in quantity and variability. Volumes of storm water runoff can be large during intense storms, yet come on an infrequent basis. Therefore it is important to maintain inspection of all storm water management structures such as storm sewers, catch basins, open channels, retention/detention basins, basin discharge outlet control structures,

grates, oil/grit/water separators, sumps, etc. Structural improvement on buildings, roofed areas, parking lots, and other paved areas are also crucial in controlling storm water runoff quantity. The ultimate goal is to slow the water down, reduce the amount, and improve the water quality.

Storm water runoff is a major source of water pollution affecting both surface water and groundwater quality. Nutrients, heavy metals, and sediments, adversely affect water quality. The first step toward removing pollutants from a storm water collection system is to allow only storm water to enter the collection system. Most urban runoff pollution problems are a direct result of human activity. Historic storm water control attempted to transport storm water to natural river courses as rapidly as possible to minimize local flooding. Unfortunately, this means of conveyance also efficiently transported pollutants from areas of human activity directly to the water course. Sources of contamination that contribute to storm water runoff problems include:

- Wastes stored outside of homes, commercial establishments and industrial sites
- Motor vehicle fluids and wear (e.g. brake liners)
- Wastewater from car maintenance
- Domestic sewage or hazardous waste
- Wastewater from transient cleaning operations such as floor, rugs, carpet cleaning, external building siding (power washing), or pavements
- Effluent from cooling tower, emission stacks, or from a boiler
- Runoff water from animal containment areas
- Backwash from swimming pools
- Water containing superchlorination
- Substances or materials that will clog the storm water collection system
- Construction activities

The most cost efficient way to control pollutants is to prevent them from coming into contact with storm water. Pollution prevention or source controls should be the foundation of any storm water control program. If source control is impractical, then structural (or end of pipe) solutions should be instituted.

### **Best Management Practices: Structural & Source Controls (Nonstructural)**

Structural controls are typically engineered systems which treat storm water runoff at some point within or at end of the collection system. Source control BMP's focus on the location and generation of pollutants; these practices control runoff at the source rather than within the collection system. The combined use of both structural and nonstructural systems is a crucial element in water quality control. The RPO document entitled Rouge River Watershed BMP Manual details the types, costs and effectiveness of most applicable BMP's. Listed below are examples of the most common BMP's:

#### **A. Structural BMP's**

1. Infiltration Systems
  - a. Retention Areas
  - b. Exfiltration Trenches

- c. Swales
  - 2. Underground Percolation Systems
  - 3. Vegetative BMP's
    - a. Filter Strips
    - b. Urban Forestry Techniques
    - c. Basin Landscaping
    - d. Shallow Marshes
  - 4. Wetlands
    - a. Detention
    - b. Filtration
    - c. Constructed Marsh
- B. Source Controls (Nonstructural)
- 1. Remediation of Illicit Connections
    - a. Sanitary Sewer Connections
    - b. Overflow Structures
    - c. Industrial Drains
    - d. Managing Septic Systems
  - 2. Street Cleaning
  - 3. Fertilizer Application Control
  - 4. Solid Waste Collection
  - 5. Zoning Restrictions

The purpose of zoning (and planning) is to balance land uses in a manner which allows a community to grow without negatively impacting existing residents. Environmental issues have been often overlooked when local ordinances have been created. The goal of any ordinance revision is therefore to integrate land uses such as conservation, recreation, and residential, as well as commercial, and industrial development. Zoning can be used to limit development density or restrict land uses that have a high tendency for producing water pollutants.

The following table lists some communities which currently have storm water control ordinances and some applicable examples.

**CONTROLLING STORM WATER QUANTITY & QUALITY**

<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Canton Twp.	<b>RPO Model Ordinance Document (p. 18)</b> Post Development non-point source pollution runoff load shall not exceed the pre-development load.
Dearborn Hts.	<b>Washtenaw County - Capture and Treat</b>
Lathrup Village	1. 100 yr. storm
Novi	2. The Bank Full Flood: the 1.5 year/24 hr storm 3. The 1st Flush: the 1st 0.5 inch of runoff for 24 hr.
River Rouge	The allowable release rate will be between 0.1 and 0.2 cfs per acre.
Southfield	<b>Northville - Capture and Treat</b> Capture 100 yr. storm

Note: See Table 1-3 (p.3) as a reference

**2.2 SOIL EROSION AND SEDIMENTATION CONTROL**

Waterways receiving runoff from rapidly developing and fully developed areas often experience severe erosion problems. This sedimentation comes from both the developing land surface and the existing streambank channels. Natural streambank vegetation stabilizes the banks, reduces storm water runoff, enhances water quality, and provides food and nesting habitat for fish and wildlife. Modern development has caused destruction of streambank vegetation resulting in erosion of property, and increased sedimentation and runoff into subsequent river channels.

Thus erosion control ordinance must limit the soil exposed during redevelopment, limit the rate at which water is transported across the exposed land, and allow for on-site capture of the sediment prior to discharging water from the site.

The following table lists some communities which currently have ordinances on soil erosion and sedimentation control and some applicable examples.

<b>SOIL EROSION &amp; SEDIMENTATION CONTROL</b>	
<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Dearborn	<p><b>Washtenaw County Drain Commissioner (p.19)</b> Permanent erosion control measures should be taken to remove solid particles (sediment) of 27.5 microns and larger from the storm water prior to it leaving the site. Headwalls, grouted rip-rap or slope paving will be provided where necessary to prevent erosion. Ditches with steep grades or unstable soils will be protected by sod, vegetative erosion control, or geotextile fabric.</p> <p><b>Oakland County Erosion Control Ordinance No. 54 (p.14-15)</b> Preserve the natural topography of site, &amp; remove sediments before it leaves the site with straw bales, sediment basins/traps, filter fabrics, and rock filters.</p>
Garden City	
Livonia	
Lyon Twp.	
Northville	
Romulus	
Westland	

Note: See Table 1-3 (p.3) as a reference

## **2.3 MANAGING SEPTIC SYSTEMS**

Soil and hydrologic properties are key to proper septic system installation. Soil can determine the effectiveness of any septic tank-soil absorption system. Release of septic effluent into improper soil can cause major surface and groundwater contamination. Soil permeability, depth to water table or bedrock, and susceptibility to flooding are soil characteristics that need to be considered for proper treatment of effluent. The following listing summarizes the contaminants produced by septic systems and identifies alternatives aimed at controlling those pollutants.

### **A. Water Contaminants in Septic Systems**

1. Nitrates
2. Heavy Metals
3. Toxic Organics
4. Pathogenic Bacteria, Parasites, and Viruses
5. Phosphorus
6. Chloride, Sulfate, and Sodium
7. Total Suspended Solids

### **B. BMP'S and Alternative Technologies**

1. Conservation of water within individual households can significantly reduce waste flow and extend septic drain field capacity. One of the best ways to reduce waste loads is to replace existing plumbing fixtures and appliances to water conserving devices.
2. Septic Tank Modifications
  - a. Effluent Filters
  - b. Two-Tank Systems

- c. Septic System Maintenance Requirements.
3. Soil Absorption System Modifications
    - a. Mound Systems
    - b. Sand Filter Systems
    - c. Pressure Distribution
    - d. Alternating Drain Fields

When drafting an ordinance the following should be considered:

1. Assurance of Proper Location, Design, Installation, and Operation
2. Allow for an Adequate Zone of Unsaturation
3. Distance to Surface Water and Wells
4. Septic Tank Density of One or Less Dwelling Unit Per Acre
5. Disposal of Septage
6. Maintenance of Septic Systems
7. Septic Tank Moratoria

The following table lists some communities which currently have ordinances on controlling septic systems and some applicable examples.

<b>MANAGING SEPTIC SYSTEMS</b>	
<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Commerce Twp.	<p><b>Washtenaw County Drain Commissioner Regulations (p.20)</b> No drain fields or septic areas may be located within 100' of the annual high water mark of any lake, river or stream that will be holding water for more than 48 hours or does not have an outlet. The isolation distance can be reduced to a minimum of 50 feet if the detention area is to hold water for less than 48 hours and has an outlet.</p> <p><b>Novi Code Article III Sec. 34 - 111 (p. 2252)</b> It shall be unlawful for any person to dump, discharge, or authorize the discharge of septic tank sludge and/or effluent upon any property, private or public, in the city.</p> <p><b>Oakland, Washtenaw, and Wayne Counties</b> - Regulates the location, design, and installation of septic systems.</p>
Garden City	
Farmington Hills	
Northville	
Novi	
West Bloomfield	

Note: See Table 1-3 (p.3) as a reference

## 2.4 PROTECTING WETLANDS

The performance of storm water control facilities can be improved by incorporating wetlands into the drainage system. Wetlands provide erosion and sediment control, streambank stabilization, floodplain control, and aquatic transition zones. Wetlands improve water quantity by decreasing the velocity of storm water and improve water quality by filtering waterborne sediments, excess nutrients, heavy metals, and other pollutants. Wetlands also provide food and shelter, essential breeding, spawning, and nesting for fish and wildlife. Wetlands are critical to preventing downstream flooding and providing ground water recharge areas.

When developing a local ordinance to protect wetlands the following should be considered:

1. How will certain activities impact the function of the wetland habitat, and on other aquatic systems within the watershed?
2. Determine whether activities absolved from state and federal regulations are contributing to a local loss of wetlands. If so, should they be regulated locally?
3. Coordinate with federal and state permitting agencies to protect locally important and environmentally sensitive aquatic habitats.
4. Set up performance standards for permitted activities to protect vital aquatic system functions and minimize cumulative impacts.

The following table lists some communities which currently have ordinances on protecting wetlands and some applicable examples.

<b>PROTECTING WETLANDS</b>	
<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Auburn Hills	<b>Oakland County Flood Plain &amp; Wetland Protection Ordinance requirement for any land alteration within wetlands (p. 25)</b> A wetland can not be filled, removed, dredged, or drained without a permit.
Bloomfield Twp.	
Canton Twp.	
Franklin Village	<b>Ann Arbor, Wetlands Preservation Ordinance No. 49 (p. 2)</b> Wetlands can not be filled, dredged, removed, developed, or drained without a permit.
Oakland Twp.	<b>City of Southfield Wetland &amp; Watercourse Protection Ordinance No. 1315 (p. 7-8)</b> Requirement for Private, Public Agencies, and Operations; it is prohibited to deposit, remove, dredge, fill, alter, build, or drain a wetland or watercourse without a permit.
Rochester Hills	
Southfield	
Wixom	

Note: See Table 1-3 (p.3) as a reference

## **2.5 MAINTAINING VEGETATIVE BUFFER ZONES & STABILIZING STREAMBANKS**

The areas adjacent to and upland of stream channels or wetlands are known as vegetative buffer zones. Unregulated development can infringe buffer zones, cause silt-laden surface water runoff, increases streambank erosion and sedimentation, divert or drain groundwaters, and destroy wetland-dependent wildlife species.

Buffer zones protect water quality, reduce the potential for negative impacts on stream channels, and wetlands resulting from adjacent upland development.

When drafting a local ordinance, the following should be considered:

1. How does the structure of a buffer affect its ability to reduce disturbance to the wetland or waterway?
2. How do differing land uses and levels of development affect the feasibility of buffer zones?
3. Can large wetland systems be protected by buffers just as readily as small isolated systems?
4. What are the implications of topography, soil conditions, and improper maintenance on buffer effectiveness?
5. How are the existing buffers being used by wildlife; what is the minimum buffer width needed to maintain current habitat?

Three goals have been identified to determine buffer sizes for wetland protection. They are minimization of groundwater drawdown in wetlands, sediment control, and protection of wildlife habitat.

When drafting a vegetative buffer zone ordinance, buffers should be calculated based on:

- Protection of water quantity - groundwater parameters
- Protection of water quality - slope and soils
- Protection of aquatic and wetland - dependent wildlife

Streambank stabilization methods encompass structural methods including rigid structures such as seawalls, flexible structures or revetments, and nonstructural methods which primarily rely on planted vegetation to stabilize the streambanks, or a combination of both.

- A. Structural Methods
  1. Seawalls (concrete, steel, or wood)
  2. Revetments
    - a. Stone (Riprap)
    - b. Concrete Block
    - c. Sand/Cement filled sack
    - d. Gabions

Revetments can offer a more practical and environmentally sound protection method than seawalls. Seawalls have high construction and repair costs. The advantages of revetments include lower cost, and that they provide greater surface area and sloping surface which dissipates wave energy.

- B. Nonstructural Methods or Biotechnical Erosion Control
  1. Groundcover Plants, Shrubs, Trees
  2. Cellular Grids
  3. Synthetic Fabrics

Nonstructural Methods have certain advantages over traditional methods of streambank stabilization:

- Lower costs (one-fourth to one-half the cost of riprap revetment)
- A diversity of wildlife and fishery
- Improved water quality because of reduced sediment input
- Aesthetically more pleasing than bare or revetted banks

When drafting a Streambank Stabilization Ordinance the following should be considered:

1. Storm water runoff levels after development remain at natural (redevelopment levels).
2. Avoid removal or clearing of vegetation that is part of a sensitive habitat, and/or serves as an adjacent buffer. These vegetation areas should be preserved.
3. Streambanks should provide for buffer zones.
4. Limit docks and boat traffic and the construction of seawalls.

The following table lists some communities which currently have ordinances on maintaining vegetative buffer zones and stabilizing streambanks and some applicable examples.

<b>MAINTAINING VEGETATIVE BUFFER ZONES &amp; STABILIZING STREAMBANKS</b>	
<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Canton Twp.	<b>RPO Model Ordinance Document requirement for all new developers (p. 20)</b> 100 ft from top of banks to achieve 75% reduction of sediments and 40% reduction of nutrients.
Southfield	<b>Washtenaw County Drain Commissioner (p.6)</b> A permanent buffer strip of at least 25 feet in width will be maintained or restored around the perimeter of all ponds and marshes. Buffer strips should be established adjacent to all surface waters through deed restrictions or provisions of master condominium agreements. Plantings capable of filtering storm water should be established or preserved.
West Bloomfield	

Note: See Table 1-3 (p.3) as a reference

## **2.6 FLOODPLAIN/WATERCOURSE: MAINTAINING DOCKS AND OTHER WATER DEPENDENT STRUCTURES**

Docks and associated boating activities have adversely affected the behavior and movement of many animals. Water dependent structures include boardwalks, docks, fishing piers, observation platforms, wharfs, boat ramps, boat lifts, boathouses or shelters, marinas and davits. The major concerns raised regarding these structures include the following:

- Loss of shading and displacing beneficial shoreline vegetation, benthic (bottom dwelling) fauna, and wildlife habitat
- Leaching of wood preservatives and other materials used in dock construction
- Generating turbidity and other short-term impacts to the surrounding ecosystem during construction

In addition, docks and other structures must be designed, located, and maintained properly in order to assure safe use by the public; and they must not hinder navigation of the watershed by other users. These structures must not impede the flow of normal flood waters. Dock design and construction should be done in accordance with all applicable codes and standards (for example, the Standard Building Code, the National Electric Code, the National Forest Products Association Spans, Architectural Graphic Standards) and local ordinances. A dock typically will not create a navigational hazard if:

- It does not exceed 20-25% of the distance across the waterbody within the riparian rights area.

- It provides minimum distance necessary for accessible navigation (typically defined as beginning anywhere from -2.0 to -5.0 below mean or ordinary low water).
- It does not infringe upon the main navigational channel or the adjacent property owners' riparian rights.

When drafting a local ordinance the following should be considered:

1. The purpose of making waterfront buffer regulations is to ensure the preservation of riparian corridors.
2. The indirect impacts of docks resulting from the introduction and mooring of boats and outdoor motors.
3. Integrate conservation easements related to docking structures with other waterfront buffer regulations to ensure the preservation of riparian corridors.
4. Determine the carrying capacity of the water to the level of use that can be permitted before the impacts of the proposed use exceed acceptable standards.

The following table lists some communities which currently have ordinances on floodplain/watercourse and some applicable examples.

**FLOODPLAIN/WATERCOURSE: MAINTAINING DOCKS & OTHER WATER DEPENDENT STRUCTURES**

<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Allen Park	<b>West Bloomfield Floodplain, Floodway, Watercourse, and Wetland Protection Ordinance (p.701)</b> A written permit is required to alter the topography on lands in a floodplain subject to a 100 yr. flood; locate any operation, obstruction, or structure within the floodway; and to make alterations of any obstruction or structure within these floodways or floodplains.
Birmingham	
Detroit	
Inkster	
Plymouth Twp.	<b>Washtenaw County Drain Commissioner (p.21)</b> Easement widths will be sized and situated in such a way as to allow maximum maintenance access: for open channels and water courses a minimum of 24 ft. plus the top width of the water course; for open swales a minimum of 12 ft. centered on the center line of the swale; for enclosed stormdrains a minimum of 20 ft. will be required for maximum maintenance access.
Pontiac	
River Rouge	
West Bloomfield Twp.	

Note: See Table 1-3 (p.3) as a reference

## **2.7 ESTABLISHING WILDLIFE CORRIDORS**

The purpose of establishing wildlife corridors is to allow for the free movement of plants and animals.

Forest clearance, housing developments, and the construction of roads all contribute to changes in wildlife corridors. Roads for example, are a barrier to wildlife movement, amplify predation and parasitism and are a major source of wildlife mortality.

When drafting an ordinance the following should be considered:

1. The appropriate corridor width may be as narrow as 30-300ft when much is known about the movement and behavior of individual animals, and the corridor is expected to function in terms of weeks or months.
2. The appropriate corridor width should be measured in 300-3,000ft when information about the movement and biology of a single species and the corridor is expected to function in terms of years.
3. When little is known about the movement and biology of entire species, and/or when the corridor is expected to function for decades or longer, then the appropriate width should be measured in kilometers.

While there are no examples of Rouge municipalities establishing wildlife corridors, the University of Michigan at Dearborn has an active role. Additionally, many municipalities have ordinances to protect woodlands.

The following table lists some communities which currently have ordinances on protecting woodlands and some applicable examples.

**PROTECTING WOODLANDS**

<b>Communities with Existing Ordinances</b>	<b><u>REPRESENTATIVE ORDINANCES</u></b>
Novi	<b>Oakland County Tree Protection Ordinance No. 60 (p.7 &amp; 17)</b> No person shall remove, cause to be removed, transplant or destroy any trees 6" or greater d.b.h or conifer greater than 20' without obtaining a tree permit and the developer shall erect and maintain barriers to protect remaining trees.
Rochester Hills	<b>City of Southfield Woodlands &amp; Tree Preservation Ordinance No. 1324 (p. 5)</b> A tree permit is required for the removal, transplanting, or destruction of any tree within a woodlands area, any tree of 8" inches d.b.h, a Landmark Tree or land clearing or grubbing within a woodlands area.
Southfield	<b>City of Novi Woodlands Protection Ordinance Chapt. 37 (p. 2458-9)</b>
Troy	Before development, land clearing, filling or any land alteration a permit is required. The developer is required to erect barriers for the protection of remaining trees. It is unlawful for any person without a permit to remove, destroy, or damage any tree of any d.b.h., any historic or specimen tree, and it is unlawful to take part in land clearing or grubbing.
Wixom	

Note: See Table 1-3 (p.3) as a reference

## **APPENDIX A NATIONAL EXAMPLES OF ORDINANCES**

### **Storm Water Quality Control**

- Baltimore County Stream Buffer Ordinance
- Metro Council, Minnesota Water Resources Development Guide
- Austin, TX Comprehensive Watershed Ordinance
- Seattle, WA Water Quality BMP Manual (with ordinance guidelines)

### **Streambank Stabilization, Wetlands, and Water Development Facilities**

- Illinois, Model Stream and Watershed Protection Ordinance
- Maryland Critical Areas Guidelines
- New Hampshire Model Shoreline Protection District
- West Eugene, OR Wetland Plan
- South Carolina Coastal Marina Permit Application

### **Sediment & Erosion Control, and Forest Protection**

- Imperial Beach, CA Tree Protection Ordinance
- Delaware Erosion and Sediment Control Handbook
- Gainesville, FL Tree Protection Regulations
- Prince Georges County MD Forest Protection Law
- Maryland Sediment Control Regulations
- North Carolina Erosion and Sediment Control Design Manual
- Rhode Island Soil and Sediment Control Handbook
- Loudon County, VA Tree Planting Guide

### **Vegetative Buffers and Wildlife Corridors**

- Lake County, IL Zoning Ordinance
- Charles County, MD Critical Areas Guidelines
- Montgomery County, MD Environmental Guidelines
- King County, WA Sensitive Areas Ordinance

### **Integrated Ordinances (Combination of preceding ordinances from Sections 1- 7)**

- Maryland Critical Area Criteria
- Bucks County, PA Model Resource Protection Strategy
- Alexandria, VA Storm Water Ordinance
- Prince William County, VA Bay Protection Ordinance
- City of Bellvue, WA Development Strategy

## **APPENDIX B REGULATIONS**

### **Controlling Storm Water Runoff**

Since 1972, the Clean Water Act has prohibited discharge of any pollutant to navigable waters from a point source unless a permit by the National Pollutant Discharge Elimination System (NPDES) authorizes the discharge. The NPDES program focused on dealing with point source pollutants and not nonpoint source. In 1990 EPA implemented Phase I of storm water regulations, in which five types of storm water discharges must obtain permits:

- Any discharge issued an NPDES permit before February 4, 1987.
- Any discharge from a municipal separate storm sewer system for a population greater than 250,000.
- Any discharge from a municipal separate storm sewer system for a pollution greater than 100,000 but less than 250,000.
- Any discharge which is determined to be a violation of water quality standards or significantly pollutes the water of the U.S.
- Any discharge dealing with an industrial activity.

Even though storm water runoff begins as nonpoint pollution, it is ultimately discharged through pipes, which are point sources requiring NPDES permits under the Clean Water Act. EPA requires a two part application program in the Phase I storm water regulations. The first part identifies pollution sources, pollutants, and affected waterways. The second part consists of a comprehensive management program to reduce storm water pollution.

### **Protecting Wetlands**

#### ***Rivers and Harbors Act of 1899, 33 U.S.C. 403***

Navigable waters of United States may include the following water bodies:

- Artificial canals that are subject to tidal flow.
- Waterways that were once navigable even though they are not navigable today.
- Waterways that have obstructions such as falls, rapids, or bridges.
- Waterways that have been, or are, used for interstate commerce by recreational craft.

#### ***Clean Water Act, Section 404, 33 U.S.C. 1344***

Section 404 of the Clean Water Act establishes a permit program that regulates the discharge of dredged or fill material into waters of the United States, including wetlands.

### ***Endangered Species Act of 1973, 16 U.S.C. 1536***

The Endangered Species Act protects endangered and threatened species and their habitats and directs federal agencies such as EPA and the Army Corps of Engineers to deal with the Department of Interior regarding such matters.

### ***Pollution Discharge Provisions of the Clean Water Act, 33 U.S.C. 1251 et seq.***

The goal of the Clean Water Act is to make all waters of the United States swimmable and fishable, and ultimately to eliminate all pollution discharges from point sources. The NPDES is the mechanism by which the goals of the Clean Water Act are to be achieved.

### ***Coastal Zone Management Act of 1972, 16 U.S.C. 1456(C).***

This act requires non federal applicants (for either a federal license or permit to conduct activities that affect the land or water uses in a state's coastal zone) to furnish certification that the proposed activity will comply with the state's Coastal Zone Management Program.

### ***National Environmental Policy Act of 1969***

This act requires that every federal agency include an environmental assessment or environmental impact statement for any federal action that may significantly affect the environment, including wetlands.

### ***The Food Security Act of 1985 (Swampbuster Act)***

This act works to deny farm subsidies to farmers who drain wetlands for replacement with crops.

### ***Acquisition Programs***

Under the Migratory Bird Conservation Act of 1929, and the Migratory Bird Hunting and Conservation Stamp Act of 1934, the U.S. Fish and Wildlife Service may acquire wetlands for migratory waterfowl habitat.

### ***Executive Orders***

Executive Orders 11900 and 11988 address protection of wetlands and floodplain management, respectively.

The following are areas of existing national wetlands:

- Orlando, Florida
- Tinicum Marsh in Pennsylvania
- Easton, Maryland

### **Managing Septic Systems**

There are currently no Federal Regulations directly controlling septic systems. Local planners should consider adoption of ordinances that the federal and state agencies have failed to adopt. EPA publications addresses operation and maintenance, design, construction, and installation, but do not address regulatory control. Regulatory controls available to a municipality, can include direct controls over the onsite system itself, controls over the permissible designs and installers, and any

other indirect controls. The following areas should be overseen by local officials after the system is installed:

1. Create a local municipal database that identifies the location, ownership and condition of each onsite septic system in the municipality.
2. Require homeowners to certify periodically that their onsite system has been inspected and, if necessary their septic tank has been pumped.
3. Require certification that the septic system meets current standards before mortgage approvals.
4. Require presale inspections, and certification that system is functioning properly.
5. Provide for regular inspections and surveys to target failing onsite systems.

### **Maintaining Vegetative Buffer Zones & Stabilizing Streambanks**

On the federal level, the United States Army Corp of Engineers is involved in permitting shoreline protection structures under two laws: the Rivers and Harbors Act of 1899 and the Clean Water Act of 1977.

1. *Clean Water Act, Section 404, 33 U.S.C. 1344.*
2. *Rivers and Harbors Act of 1899, 33 U.S.C. 401,403.*
3. *Endangered Species Act of 1973, 16 U.S.C. 1536*

The following are examples of buffer zones:

- The Pinelands Area - New Jersey
- Humboldt County, California
- Massachusetts Wetlands and Floodplain Protection Act
- Rhode Island Coastal Resources Management Program
- Winnebago County, Wisconsin
- Brevard and Lee Counties, Florida

### **Planning Docks and Other Water Dependent Structures**

1. *Endangered Species Act of 1973, 16 U.S.C. 1536*
2. *Coastal Zone Management (CZM) Act of 1972, 16 U.S.C. 1456*
3. *Pollution discharge Provisions of the Clean Water Act, 33 U.S.C. 1251 et seq.*

### **Establishing Wildlife Corridors**

- Natural Resources Conservation - The preservation of Mount Rainier National Park and Everglades National Park.
- Integrated Preserve and Corridor Systems - Massachusetts and Florida have created interconnected conservation reserve systems that extends over an entire regional area.
- Landscape Linkages
- Hedgerows, Fencerows, Windbreaks, and Narrow Cover Strips
- Faunal and Floral Dispersal Corridors
- Corridor Dimensions
- Larger Scale Corridors for Larger Faunal Issues

- Corridors, Greenways, Landscape Linkages, and Buffers
- Roads Rights-of-way
- Utility Rights-of-way, Canals, and Levees
- Recreational Greenway Parks
- Streamside Management Buffers

## **APPENDIX C RESOURCES**

### **Existing Model**

- Rouge River Watershed Storm Water Ordinance - June 14, 1994  
Prepared by the Rouge Program Office

### **National Ordinances** - See Appendix A

- Reference - Local Ordinance, A Users Guide by the Terrene Institute

### **EPA & Other Federal Regulations** - See Appendix B

Reference - Called EPA Chicago Hotline

- NPDES
- Rivers and Harbors Act of 1899, 33 U.S.C.403
- Clean Water Act, Section 404, 33 U.S.C.1344
- Endangered Species Act of 1973, 16 U.S.C 1536
- Pollution Discharge Provisions Of the Clean Water Act, 33 U.S.C. 1251 et seq.
- Coastal Zone Management Act of 1972, 16 U.S.C. 1456(C).
- National Environmental Policy Act of 1969
- The Food Security Act of 1985 (Swampbuster Act)
- Acquisition Programs
- Executive Orders

### **Road Commission & Drain Commissioner's Standards**

- Washtenaw County - April 1994
- Oakland County Drain Commissioner - January 1990
- Oakland Township (in Clinton River Watershed)

### **Health Regulations**

- Grand Traverse County Health Department, Benzie County Office, (616)-882-4409
- Proposed Rules & Regulations for Communities Within the Rouge River Watershed Governing Disposal of Sewage at Residential Properties

For additional information, please contact the following agencies:

**MDEQ** - Livonia (313)-953-0241  
**MDEQ** - Detroit (313)-392-6500  
**EPA** - Chicago (800)-621-8431  
**EPA** - Lansing (517)-335-2251  
**MDOT** - Detroit (313)-933-1300  
**MDOT** - Lansing (517)-373-2090  
**MDNR** - Detroit (313)-953-0241  
**MDNR** - Lansing (517)-373-2329

