# Stormwater Management Initiatives in Waterloo, Ontario

Innovative Stormwater Management Conference
University of British Columbia
Vancouver, BC

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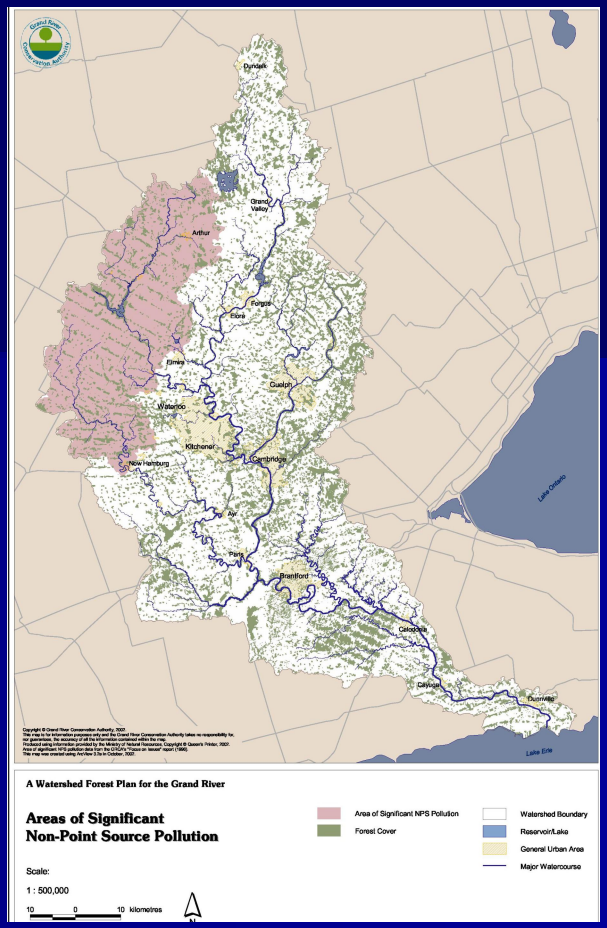


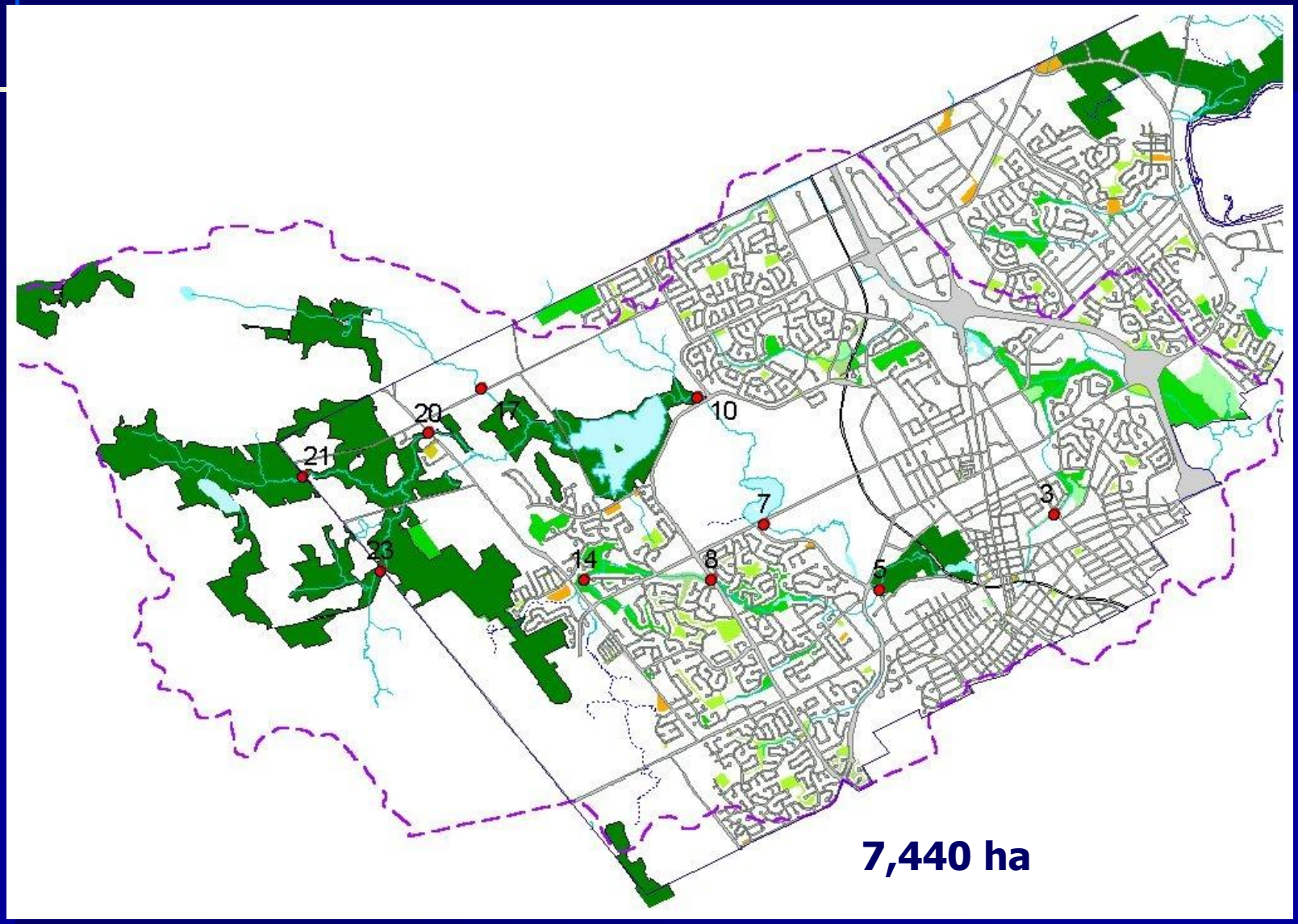

A Watershed Forest Plan for the Grand River

**Areas of Significant Non-Point Source Pollution**

Area of Significant NPS Pollution
Forest Cover
Watershed Boundary
Reservoir/Lake
General Urban Area
Major Watercourse

Scale:
1 : 500,000
10 0 10 kilometres

# Laurel Creek Watershed



# Laurel Creek Watershed Study (1993)

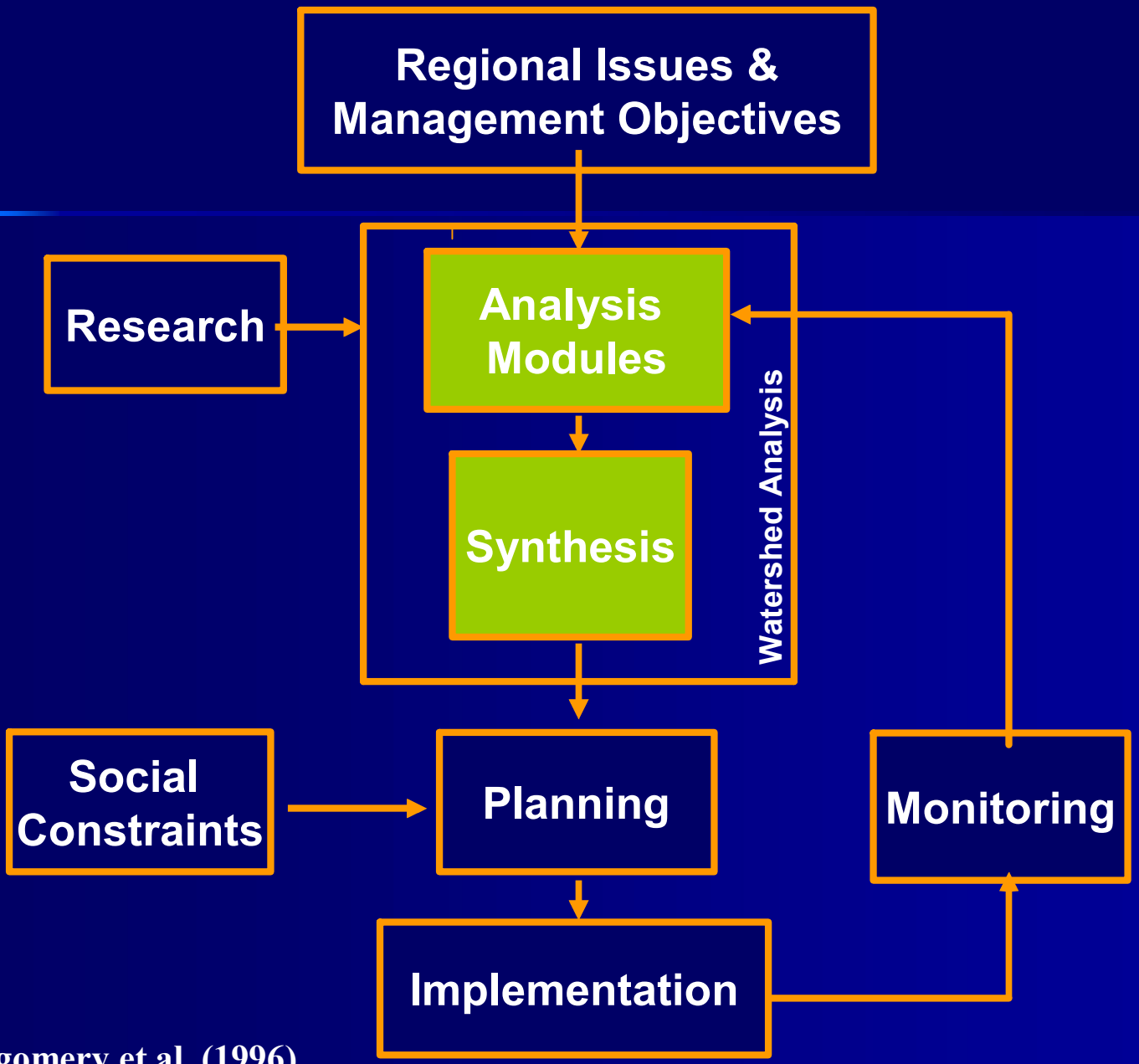
- Identify resource features and environmental problems in the watershed
- Constraint area mapping
- Recommendations into official plan

# Watershed Analysis Framework

- How does the landscape work?
- What has happened in the past?
- What are the current conditions?
- Are there trends in watershed condition?
- How sensitive is the watershed to future land management?

Source: Montgomery (1996) Water Resources Bulletin 31(3):369-386.

# Watershed Analysis Framework




Source: Montgomery et al. (1996)

# Laurel Creek Watershed Study (1993)

**Recommendations – incorporated into Official Plan**

- **Retrofit existing systems to maximize infiltration**
- **Institute water quality controls**
- **Upgrade spill prevention and control programs**
- **Locate and remove sanitary cross connections to storm sewers**
- **Develop system wide monitoring program**

# Subwatershed Studies and Stormwater Management Reports

- Policy direction to guide intensification and new development

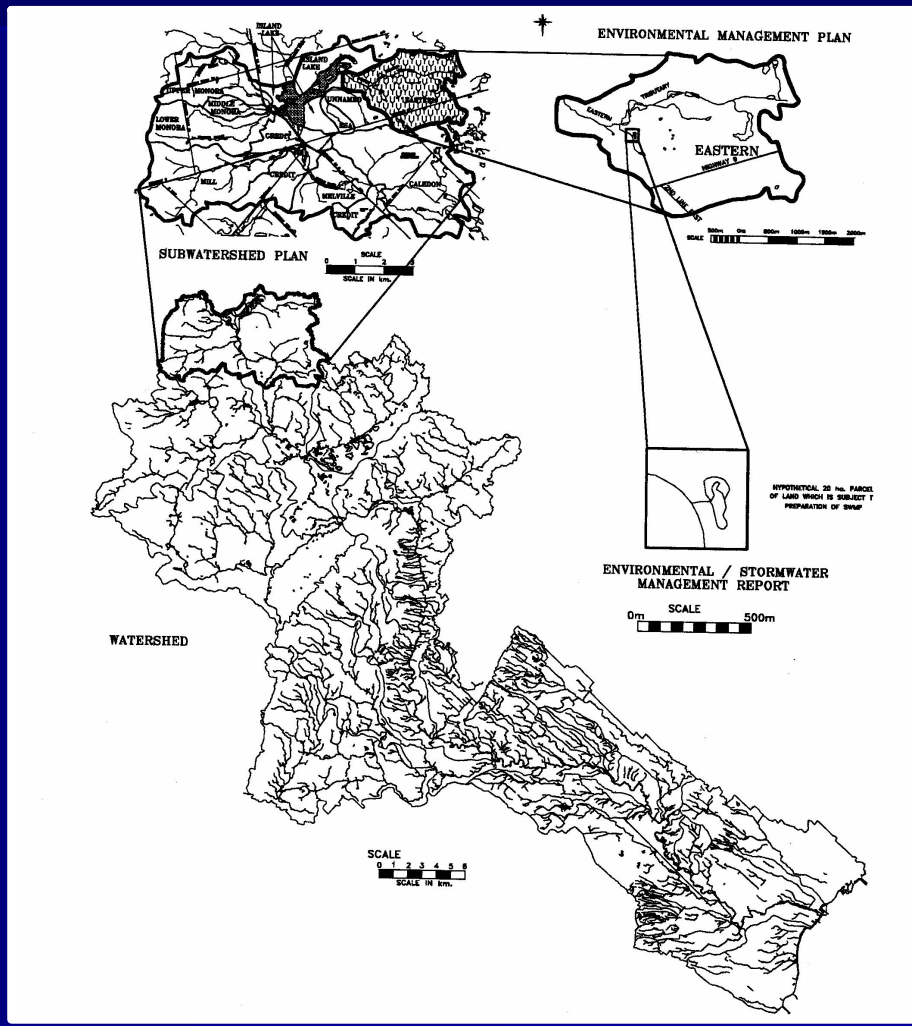
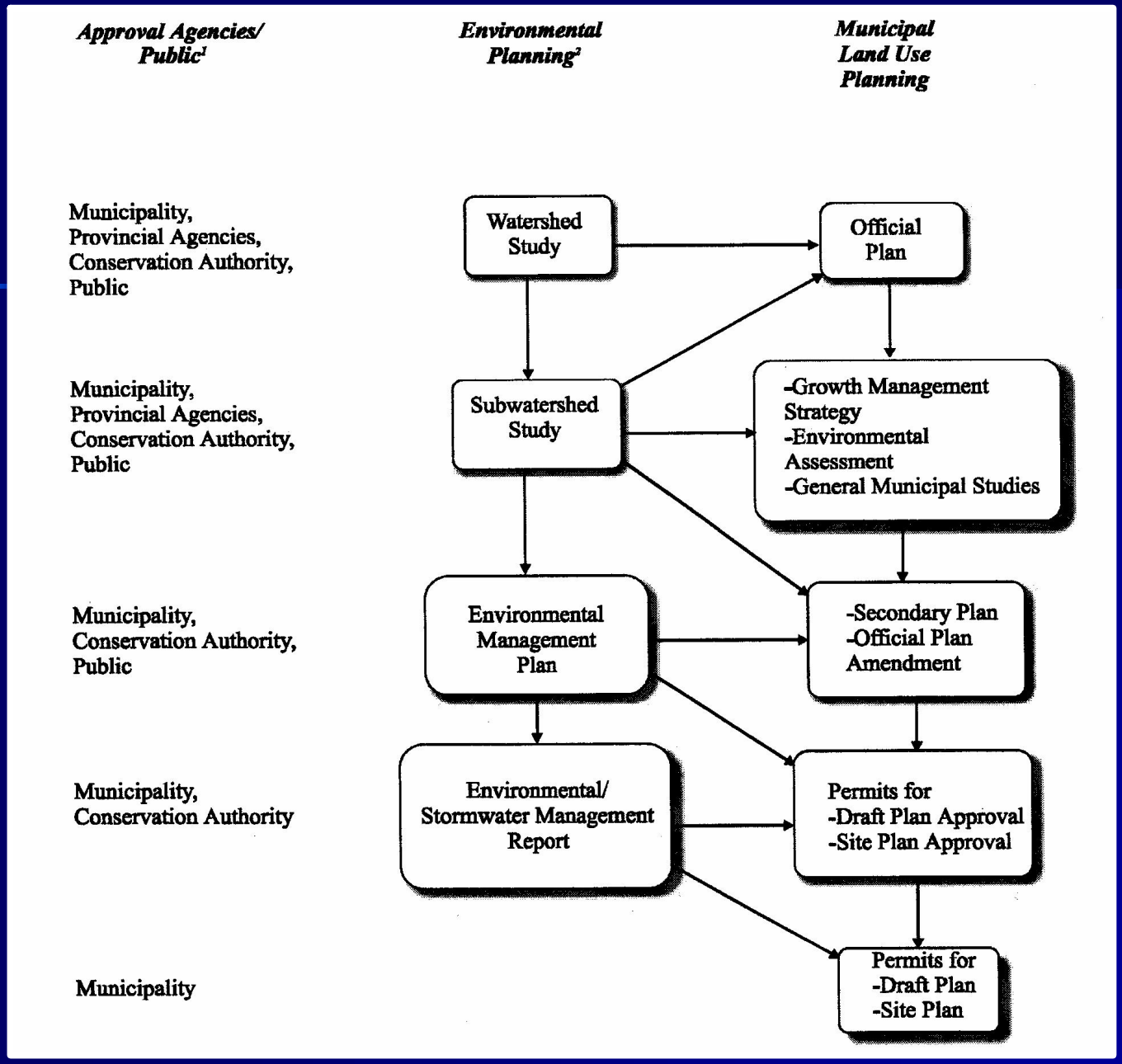
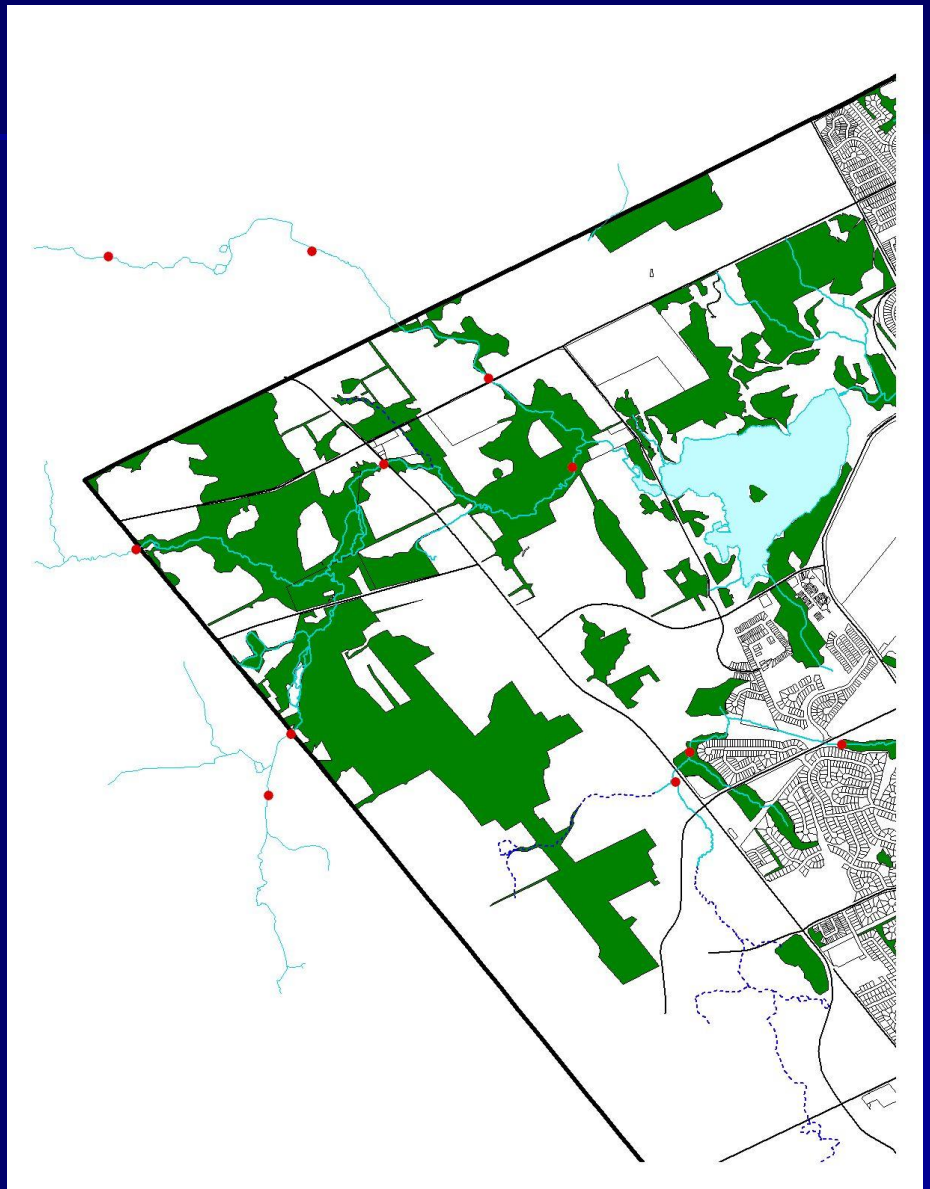



**Fig 2..2 (OME SWM Planning and Design Manual (2003)**

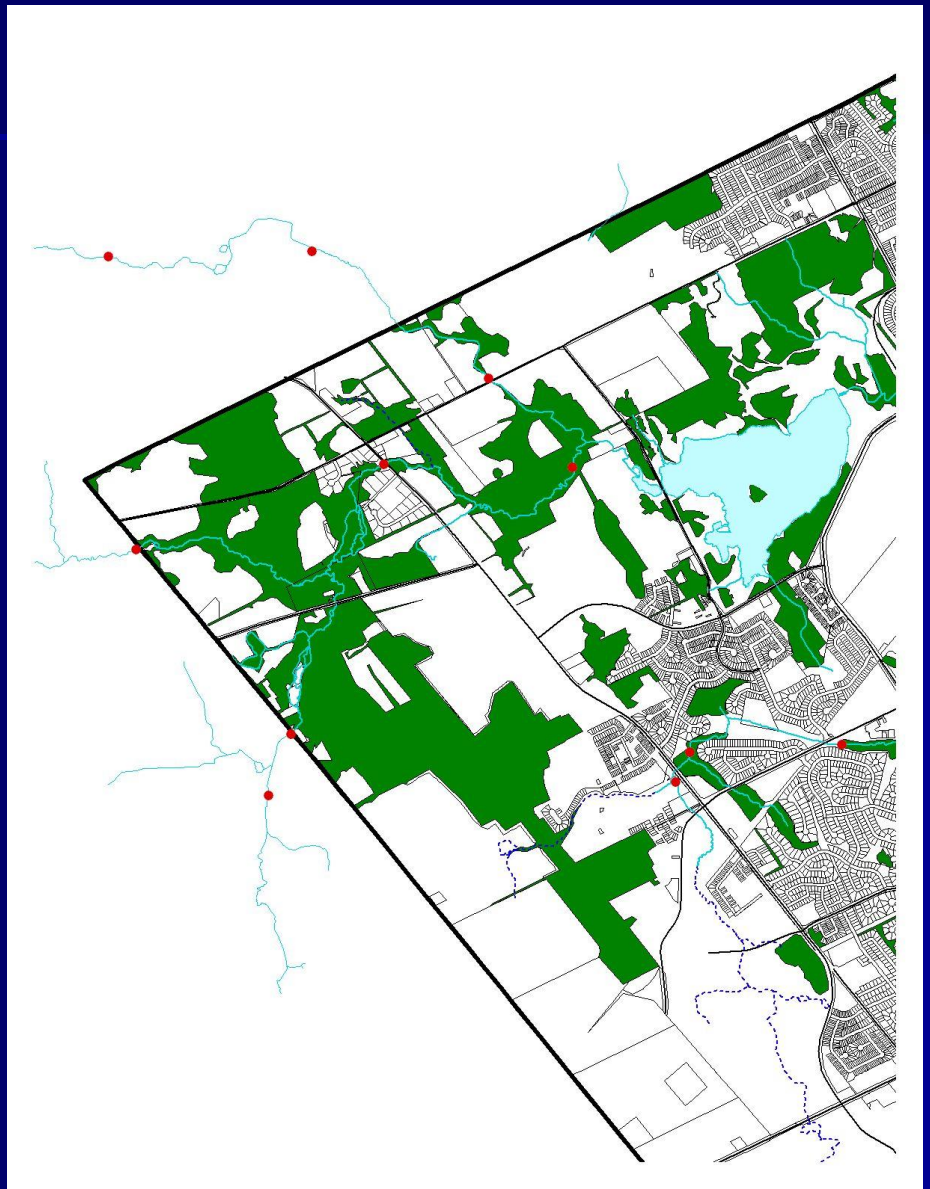



**Source: OME SWM Planning and Design Manual (2003) Fig 2.1**

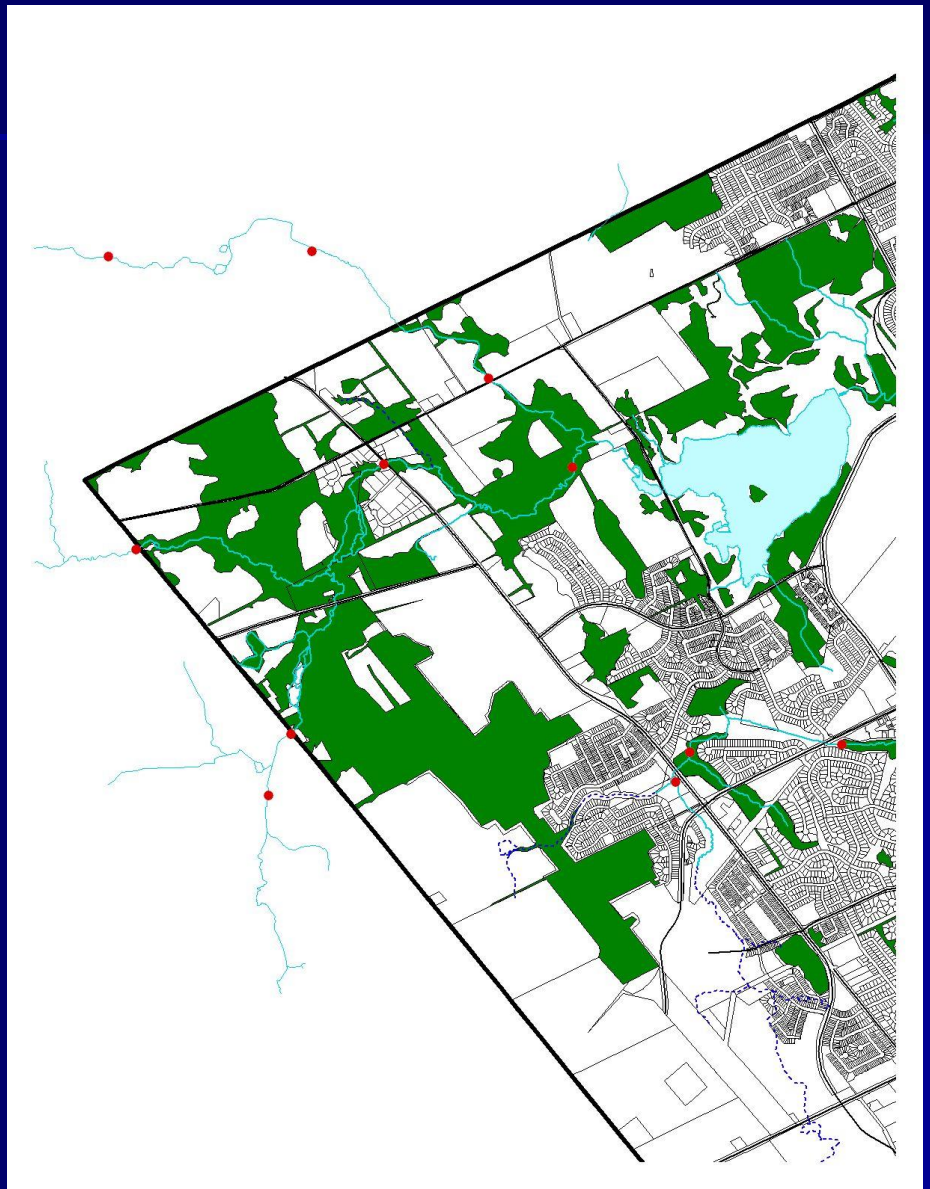
# 1997



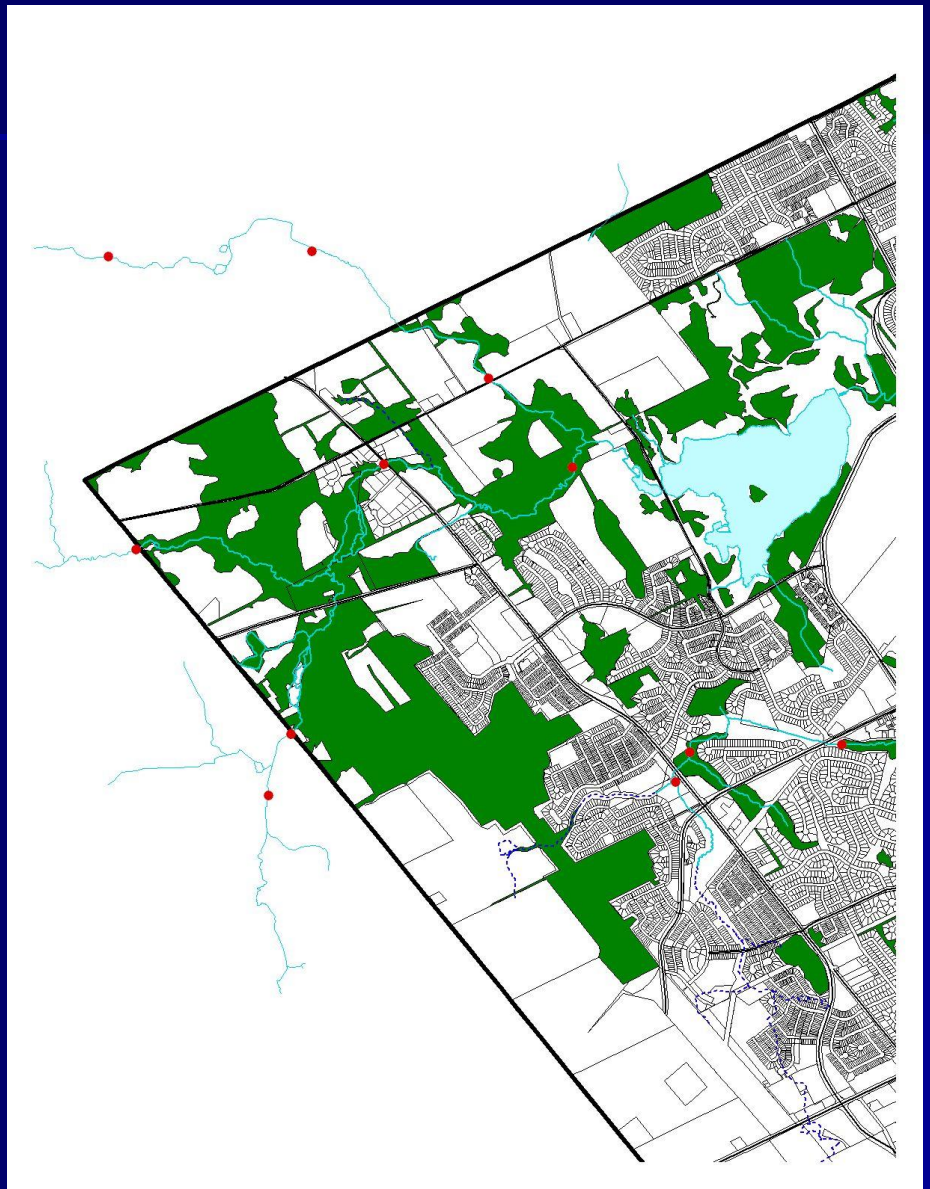
# 1999



# 2002



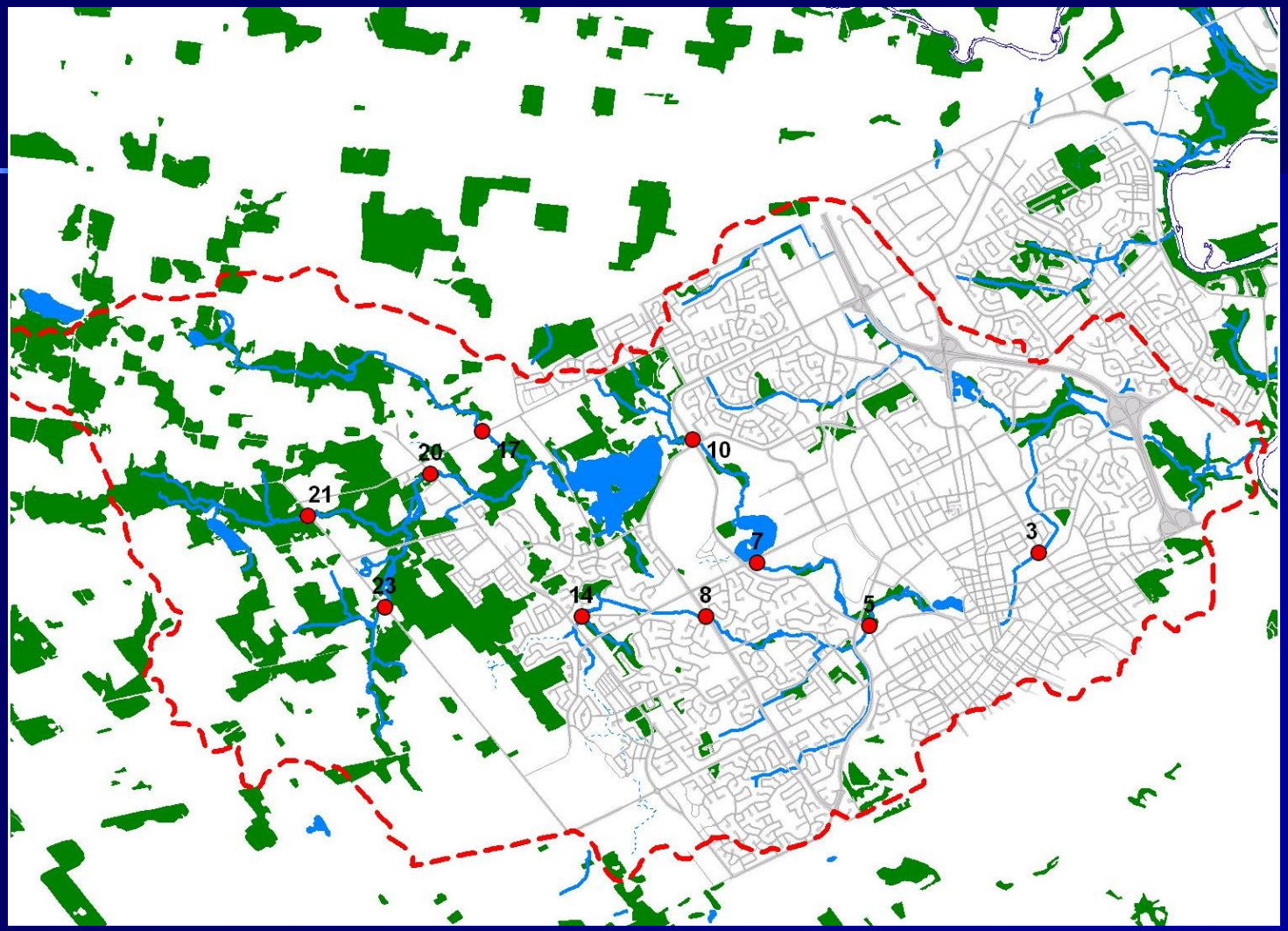
# 2005



# Waterloo Master Drainage Study (2005)

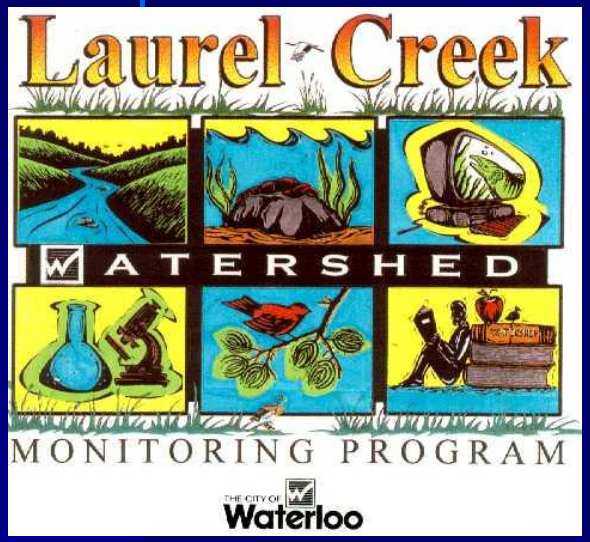
- Improve existing drainage deficiencies
- Improve existing watercourse flooding and erosion
- Implement SW measures to improve water quality and maintain infiltration rates

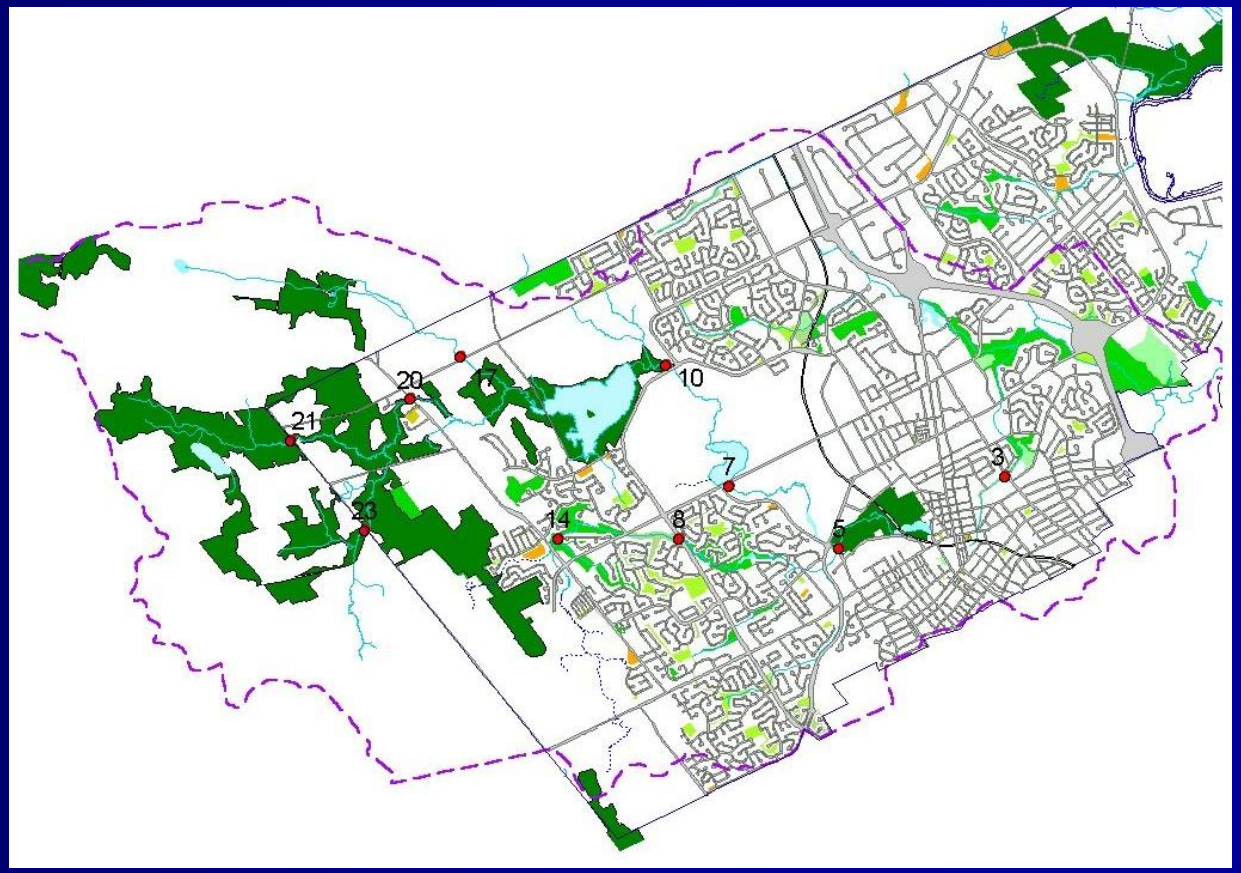
# Maintain essential resource features



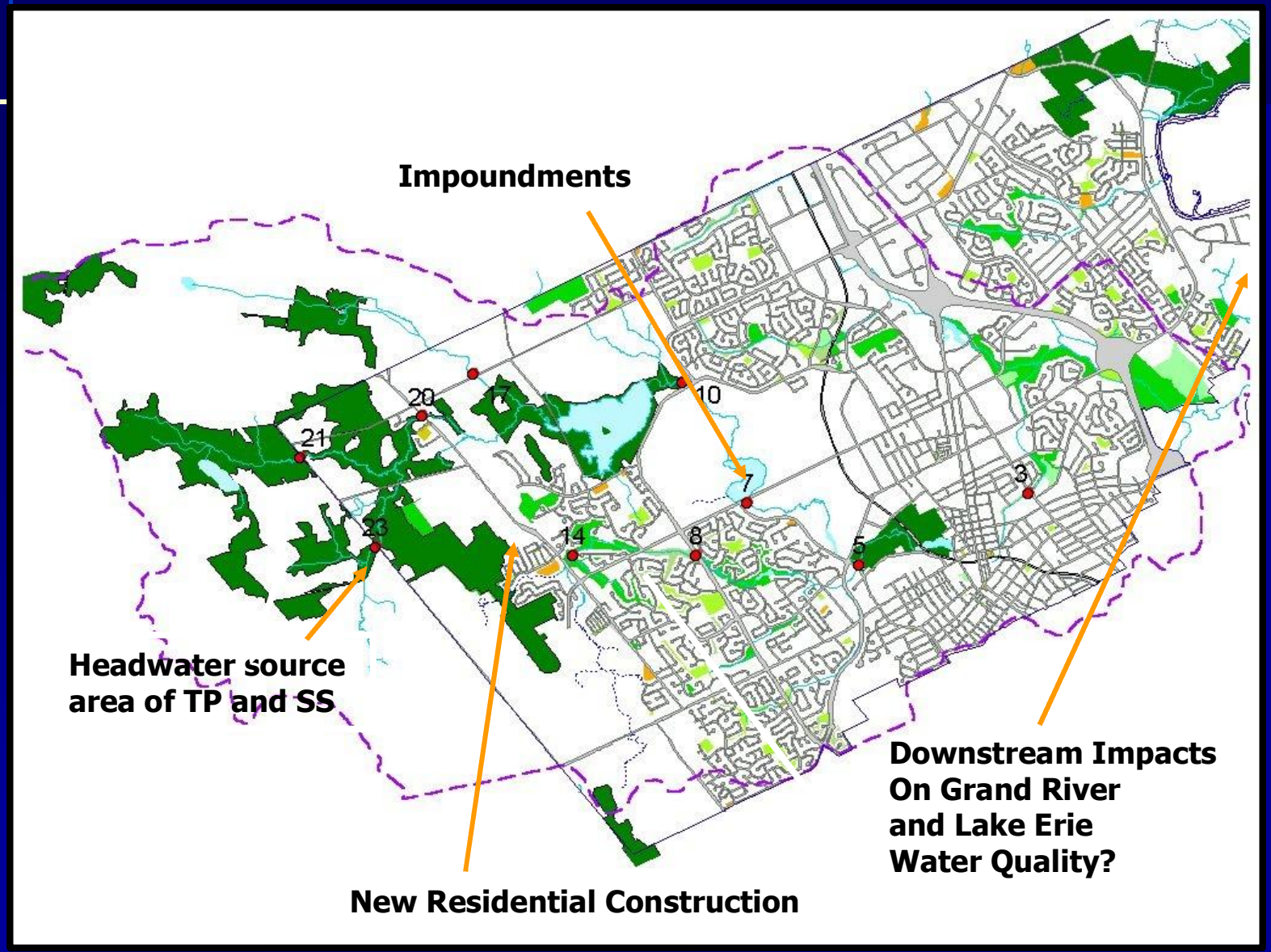

**Terrestrial and aquatic habitat, fluvial geomorphology, green space, water quality and quantity**

# Laurel Creek Water Quality Monitoring Program



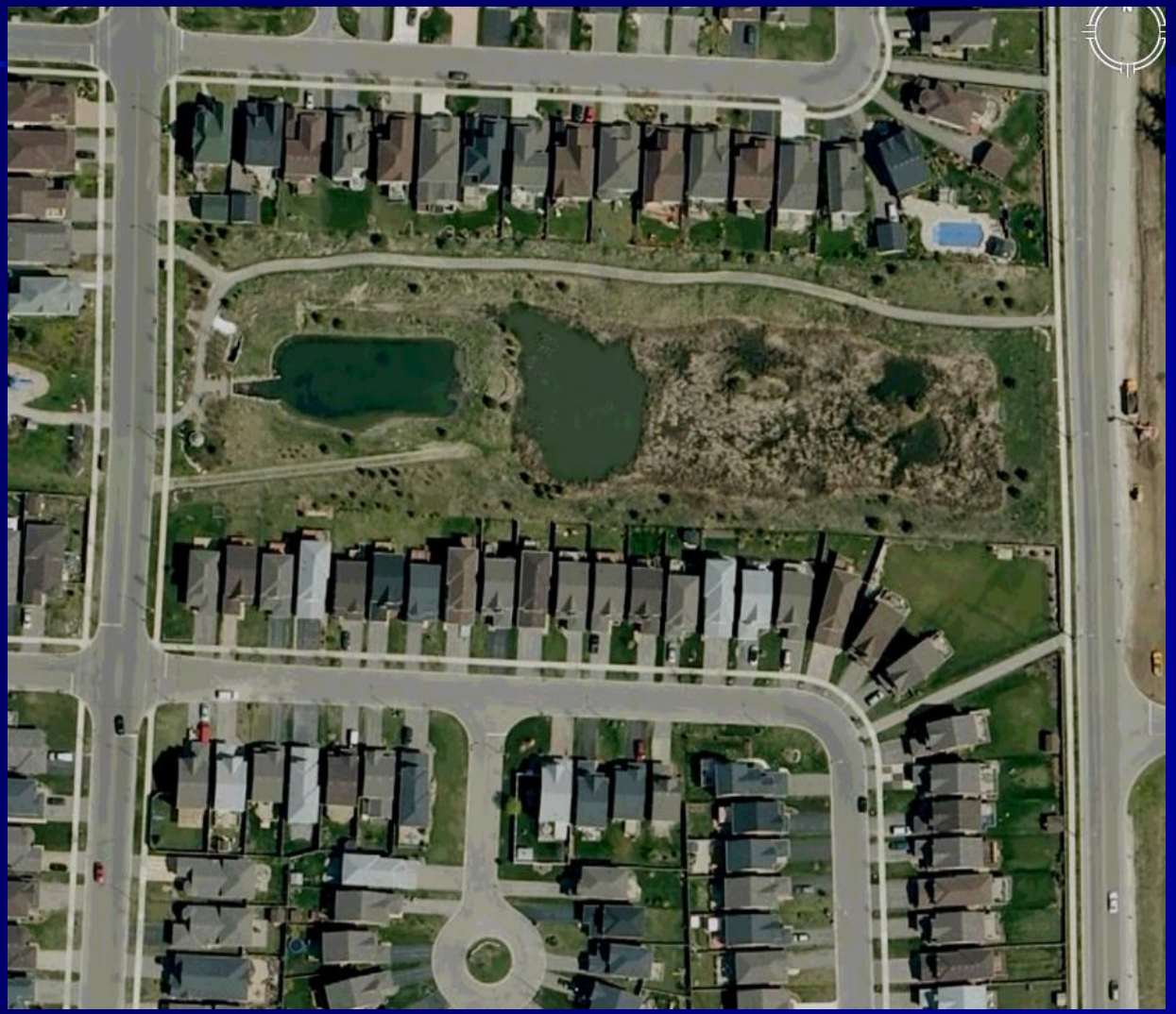
# Management Challenges



# Green Roof Initiatives

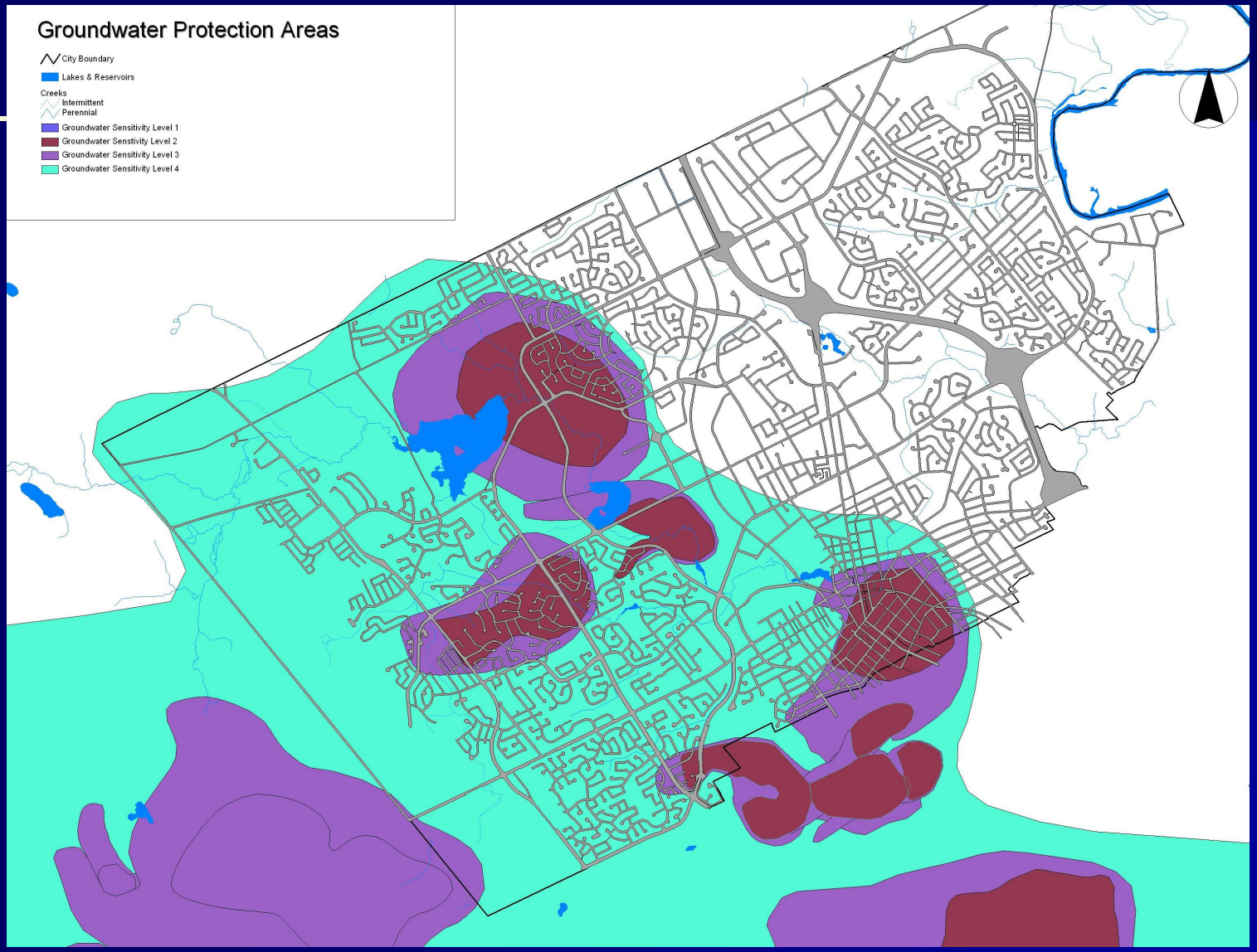
# Infiltration Galleries

# Stormwater ponds



# Redesign of Urban Impoundments

# Source Water Protection



# Successes

- Environment first vision
- Partnerships
- Constraint Level Mapping
- Decision making based on relatively good science
- Maintenance programs – street sweeping 1,550 kg/km/lane
- System and development monitoring

# Challenges

- Effectiveness of BMPs
- Monitoring programs, data sharing, standards
- Maintenance programs
- Moving from measurement to prediction
- Funding mechanisms for SWM programs
- Refining hydrologic and contaminant transport models in urban systems
- Integration of policy, planning and administration
- Reporting and capacity issues