

Effective Watershed Planning

Deborah Martin-Downs

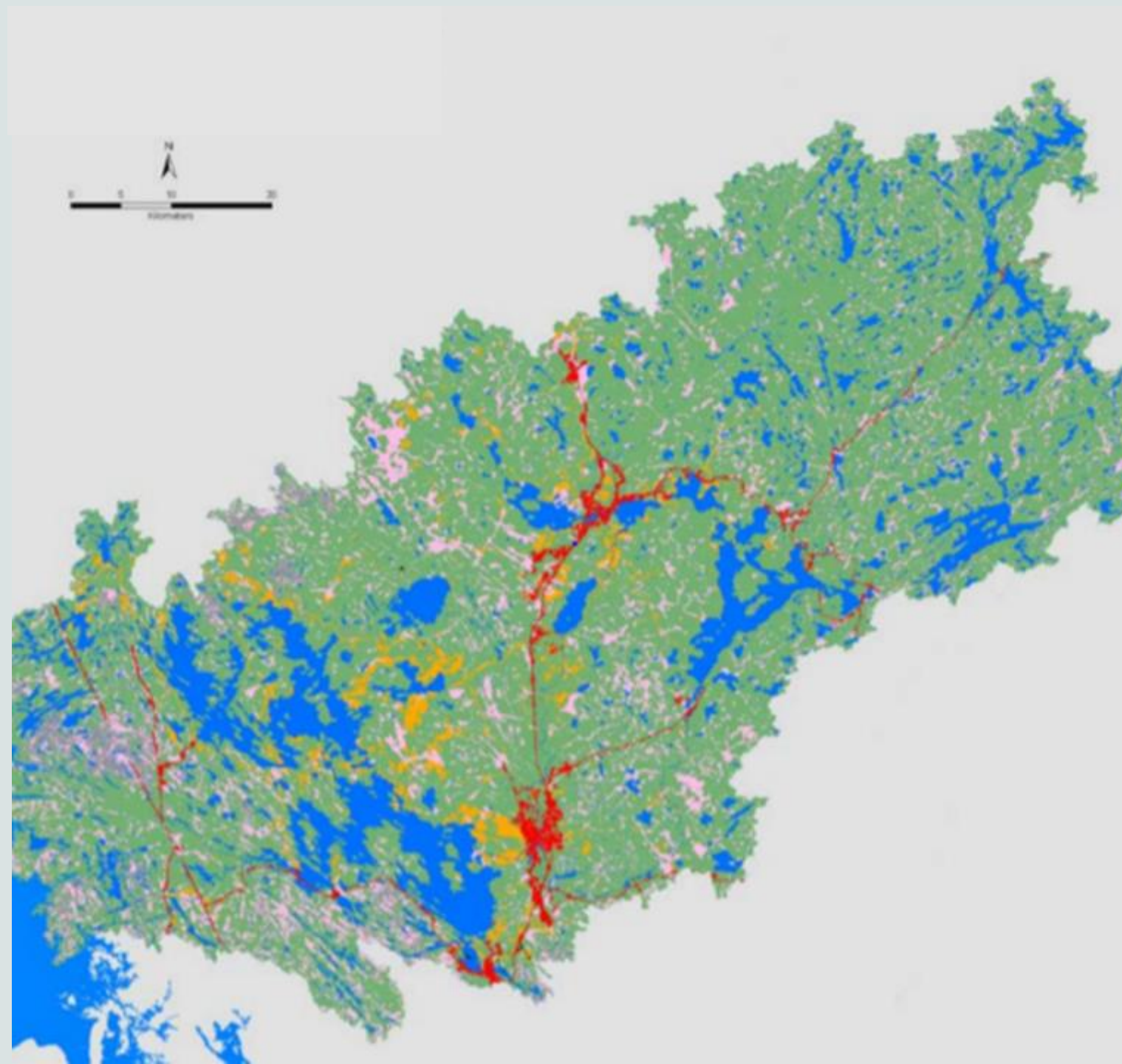
To: Community Round Table

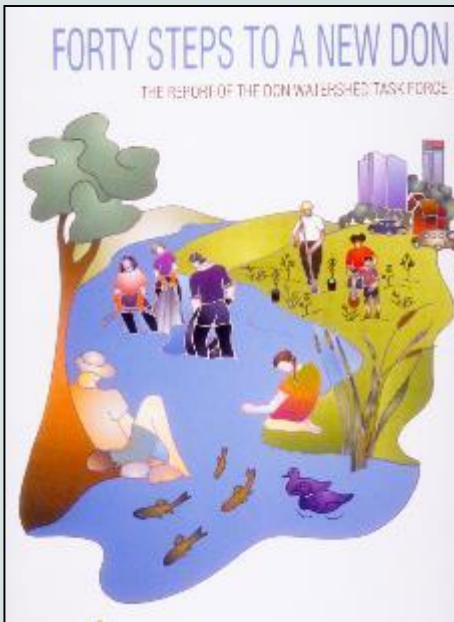
September 8, 2021



Agenda

- My Credentials
- Watersheds and their functions
- Why do Watershed Planning
- Essential Elements of Watershed Planning





My Credentials

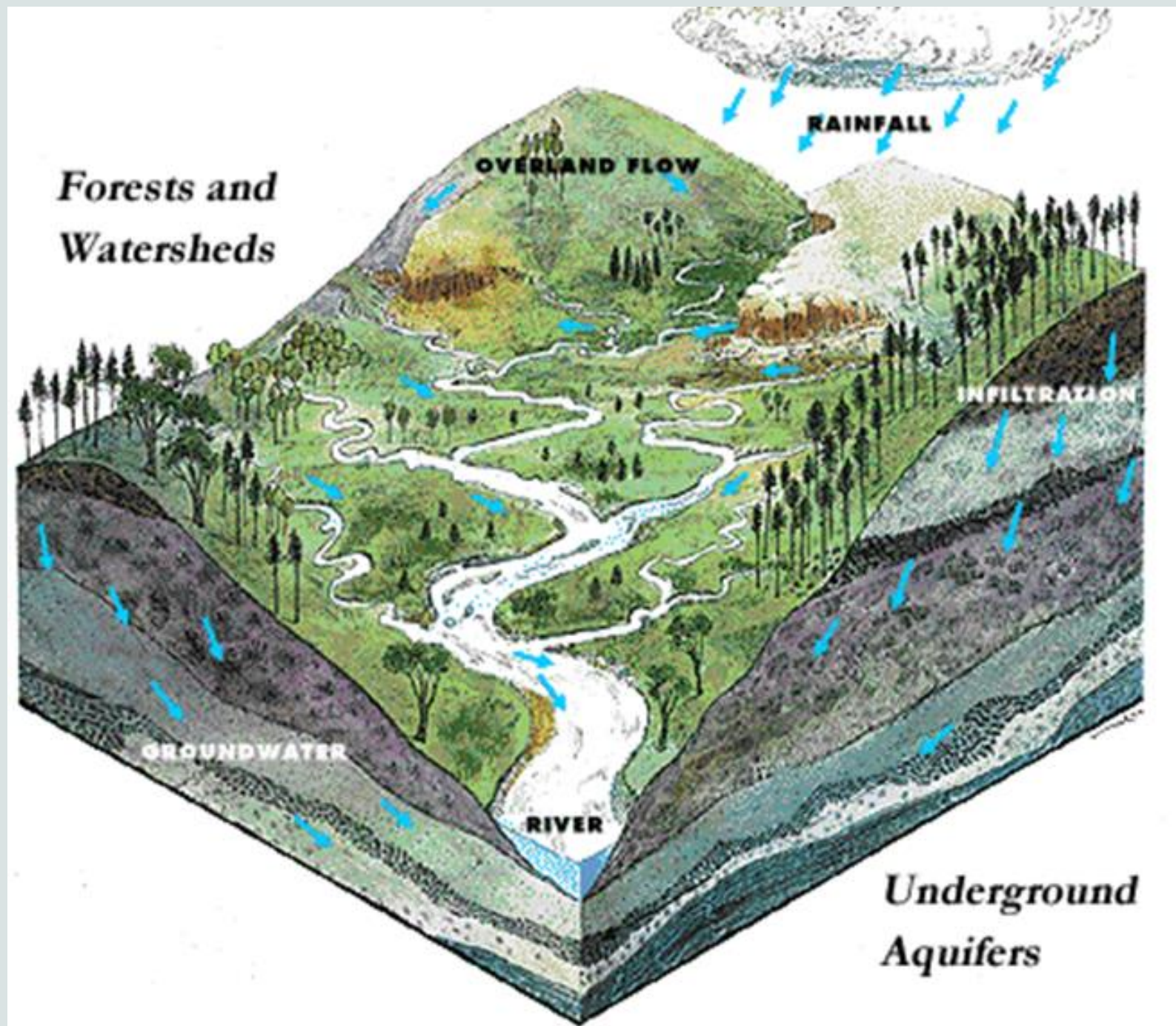
- Second Generation Muskokan
- Ecologist – fish specialization
- Consulting ecologist
- Volunteer Don Watershed Council
- TRCA and Credit Valley Conservation Authorities
- President Muskoka Lakes Association ; Environmental Committee

Watershed and Their Functions



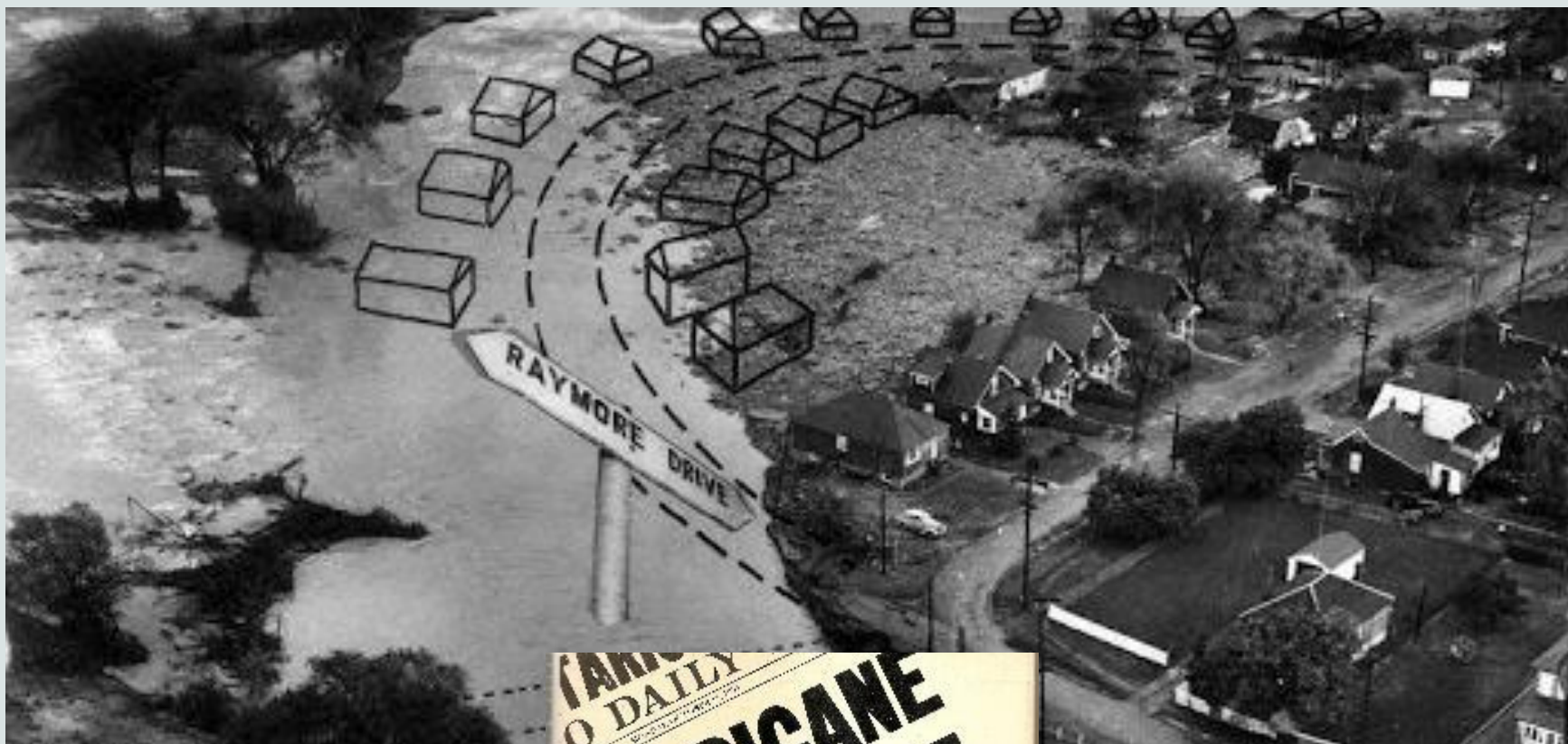
Watersheds

- A watershed is the area of land (catchment area) that captures rain and snow, and then stores, filters, seeps or drains this water into a common water body
- Land Cover, surface water, ground water, water balance
- Logical unit of management for water resources
- Not as logical for terrestrial/natural heritage systems





The genesis of Conservation Authorities
The Conservation Authorities Act, 1946



**HURRICANE
HAZEL**
BETTY KENNEDY



Why do Watershed Planning?



Watershed planning provides a framework for establishing goals, objectives, and direction for the protection of water resources, the management of human activities, land, water, aquatic life, and resources within a watershed and for the assessment of cumulative, cross-jurisdictional, and cross-watershed impacts



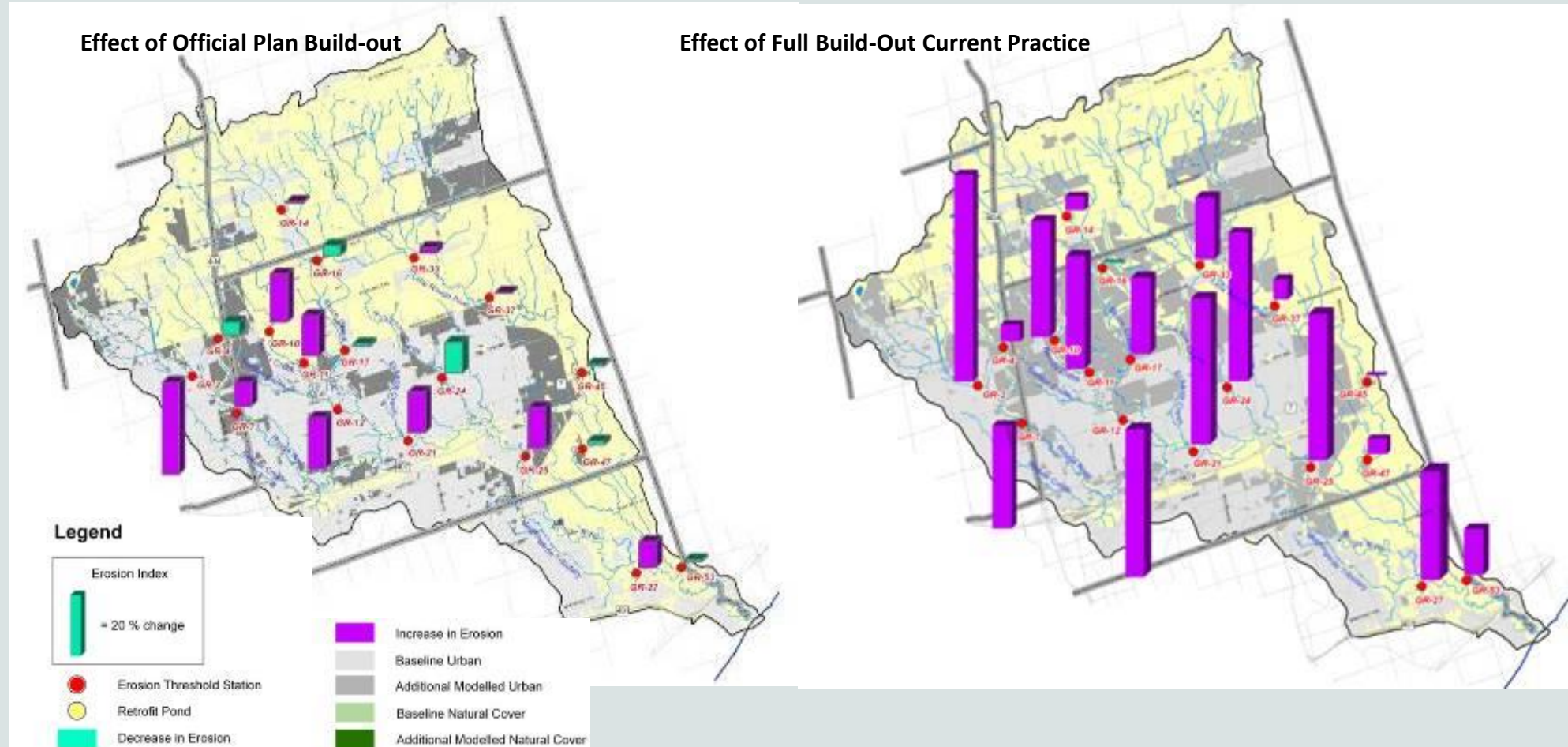
Why Do Watershed Planning?

- Establishes existing conditions to be compared to future conditions
- Identifies pathways of importance
- Identifies areas of sensitivity / significance for protection or management
- Identifies issues that can be functionally addressed at the watershed scale
- Identifies implications of growth or other land use decisions
- Develops tools to predict future conditions
- Guides the application of cost-effective mitigation measures

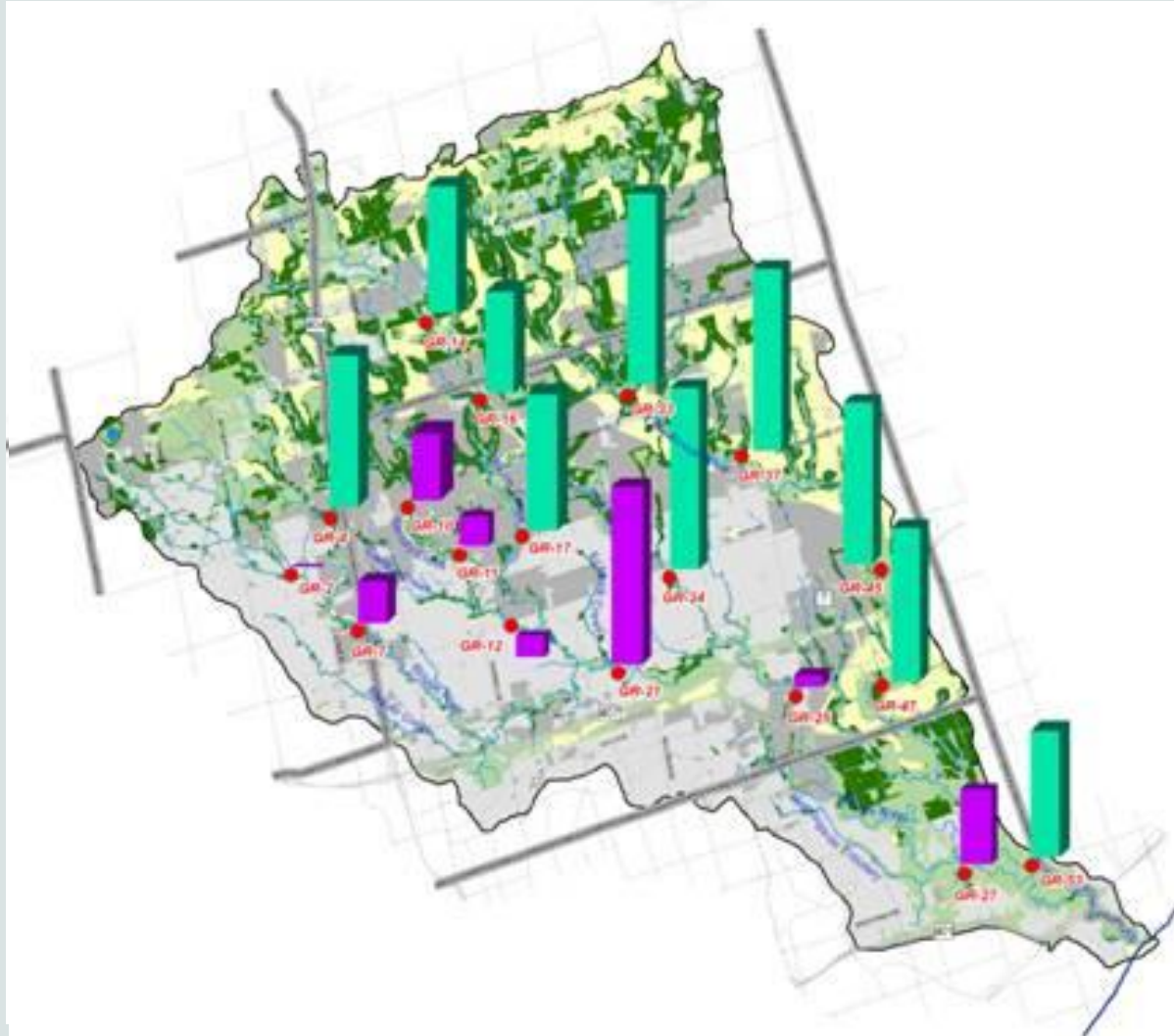
Watershed Based Local Science Knowledge and Tools

Watershed Planning Example

Effect of Build Out on Erosion Potential – Rouge Watershed

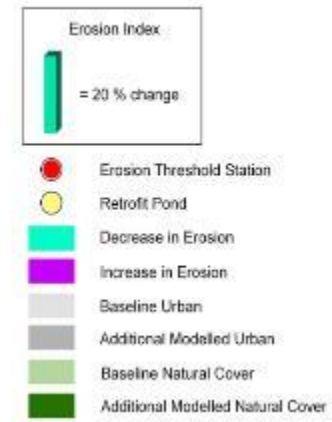


Sustainable Community Scenario



1. Increase natural cover
2. Maintain water balance
3. Build “sustainable” communities

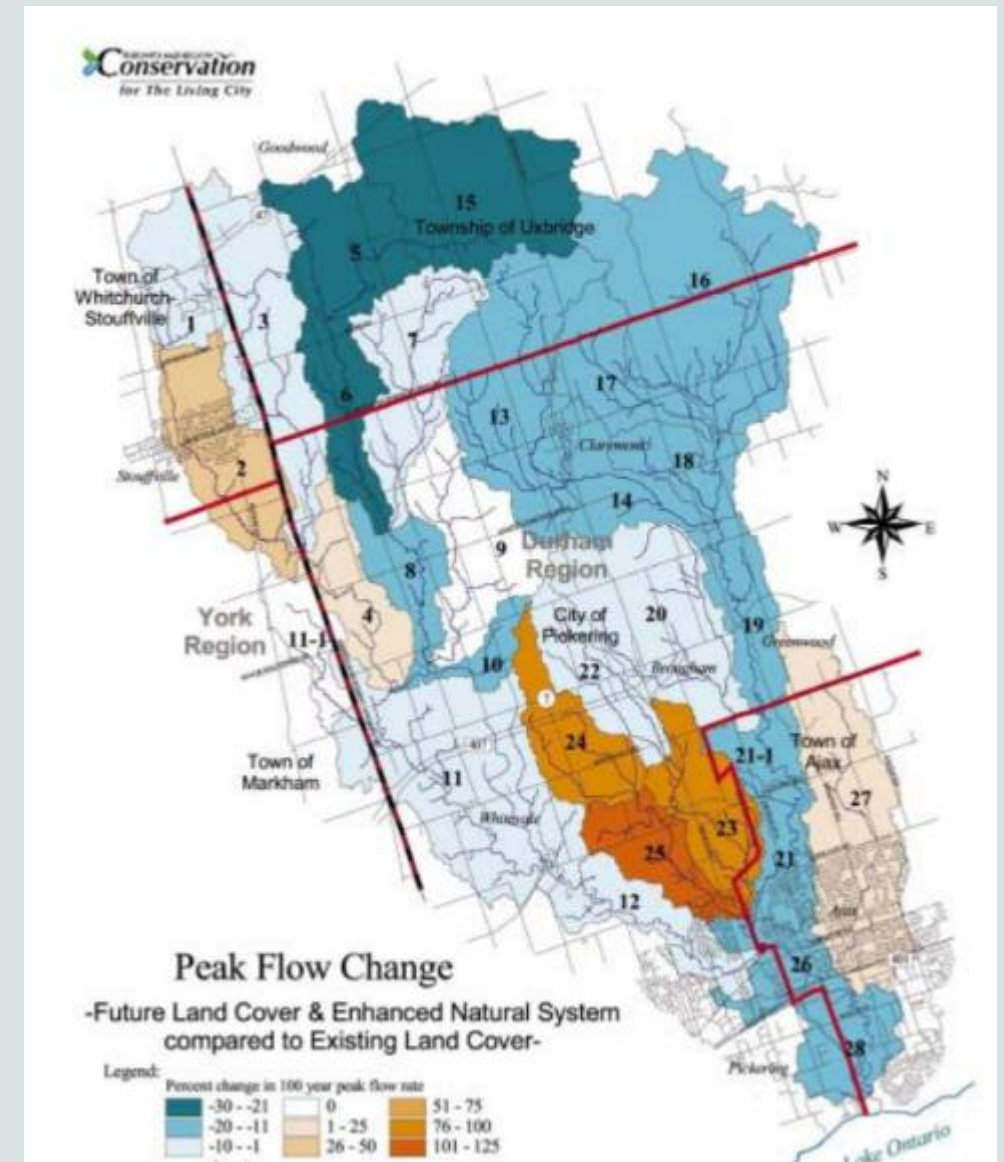
Legend



Duffins Creek Watershed Plan

IMPACT OF NATURAL HERITAGE SYSTEM ON PEAK FLOWS

The enhanced Natural Heritage scenario results in many subcatchments (light to dark blue) having peak flow decreases 0 to 25% less than existing flows for the 100-year event

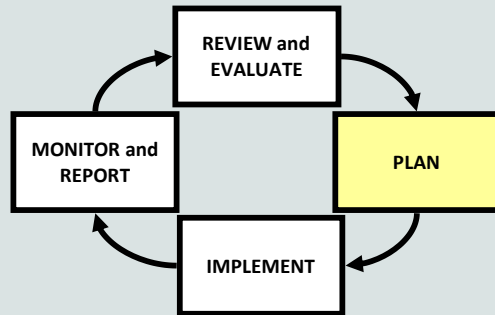


Essential Elements of Watershed Planning



Principles underlying watershed planning

- **Ecosystem Based Approach.** The ecosystem approach recognizes the interdependence of land, air, water and living organisms, including humans. The ecosystem approach uses best available science, considers cumulative impacts, encourages conservation of resources and promotes watershed and sub-watershed approaches.
- **Landscape Based Analysis.** A modern and sustainable approach to managing natural resources by managing over broader areas and longer time periods. Elements include: managing at appropriate scales; integrating and coordinating; assessing, managing, and mitigating risk; focusing science and information resources; and managing adaptively.
- **Precautionary Approach.** Caution will be exercised to protect the environment when there is uncertainty about environmental risks.
- **Adaptive Management.** Continuously improve and adapt policies and management approaches by monitoring impacts, assessing effectiveness, and adjusting actions while considering new science, traditional ecological knowledge and innovative design, practices and technologies, and the need to adapt to a changing climate.
- **Sustainable Development.** The right to development should be fulfilled to equitably meet economic and societal needs while not compromising the environment for present and future generations.
- **Collaboration and Engagement.** engage the public, Indigenous communities and stakeholders in local efforts to implement watershed planning



WATERSHED PLANNING STEPS

PHASE 1: SCOPING & CHARACTERIZATION

- *Scoping*
- *Characterize the system*
- *Set goals, objectives and working targets*

PHASE 2: ANALYSIS & EVALUATION

- *Develop management alternatives*
- *Evaluate management alternatives*

PHASE 3: WATERSHED PLAN DEVELOPMENT

- *Select preferred management alternatives*
- *Finalize targets*
- *Develop implementation and monitoring plans*

PARTNER INVOLVEMENT

Reference: CVC, GRCA and TRCA.
2002.

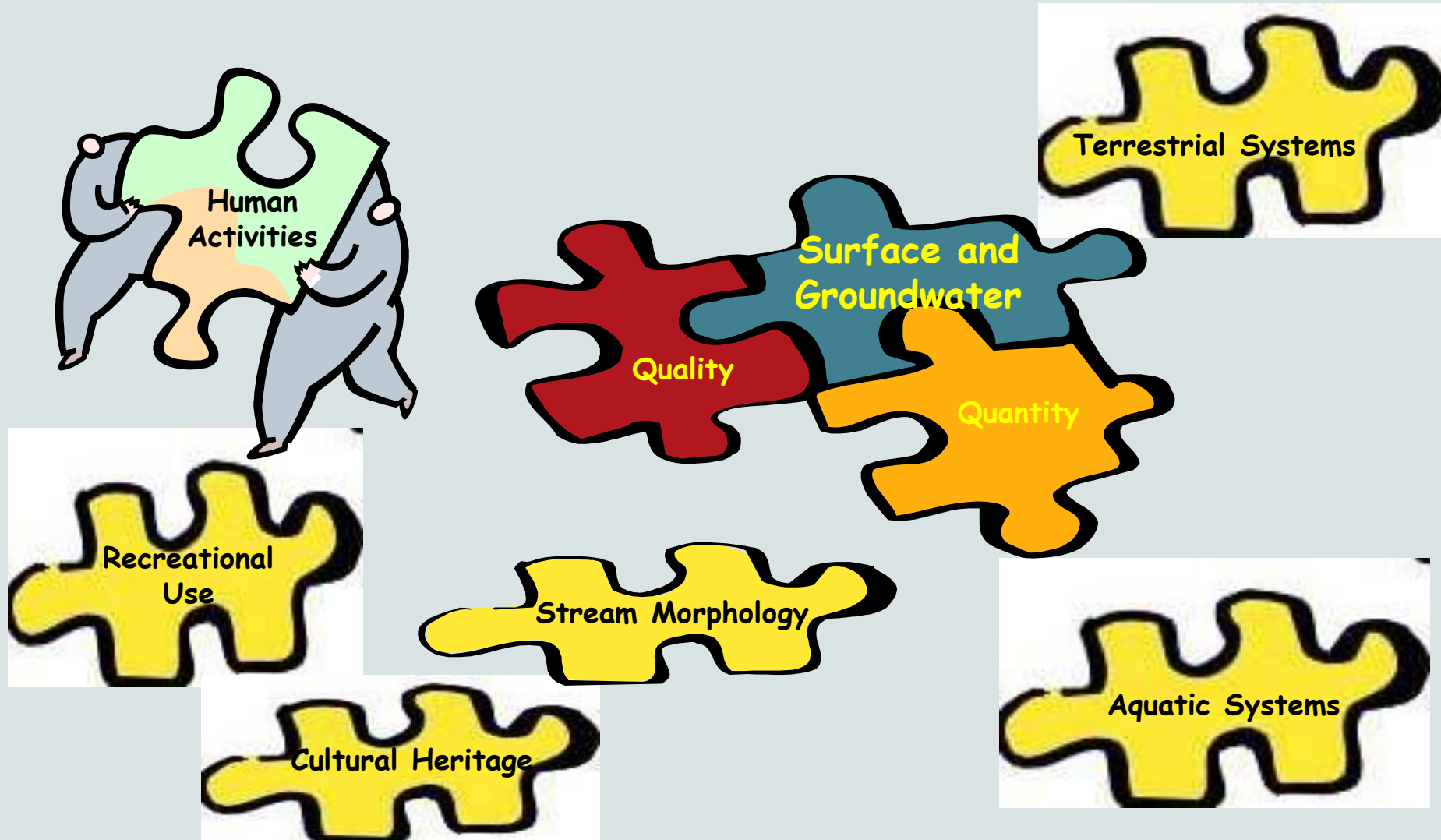
Getting Started

PHASE 1: SCOPING & CHARACTERIZATION

- *Scoping*
- *Characterize the system*
- *Set goals, objectives and working targets*

- Develop clear workplan, roles, and responsibilities
- Set clear goals, objectives, and working targets
- Collect relevant information to characterize the system – this may mean scoping things out
- Integrate information from each discipline

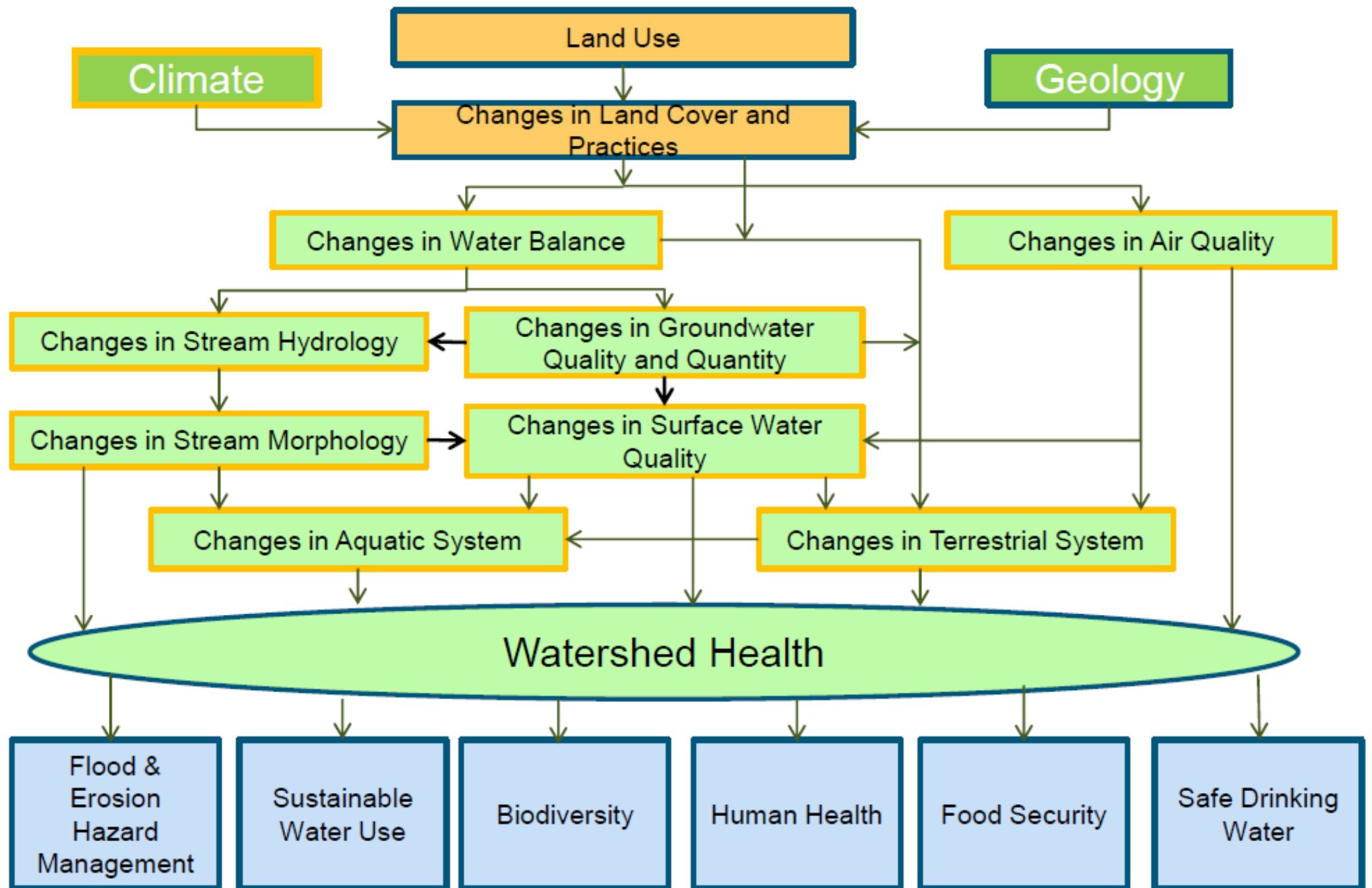
Watershed Study Components



Stressors

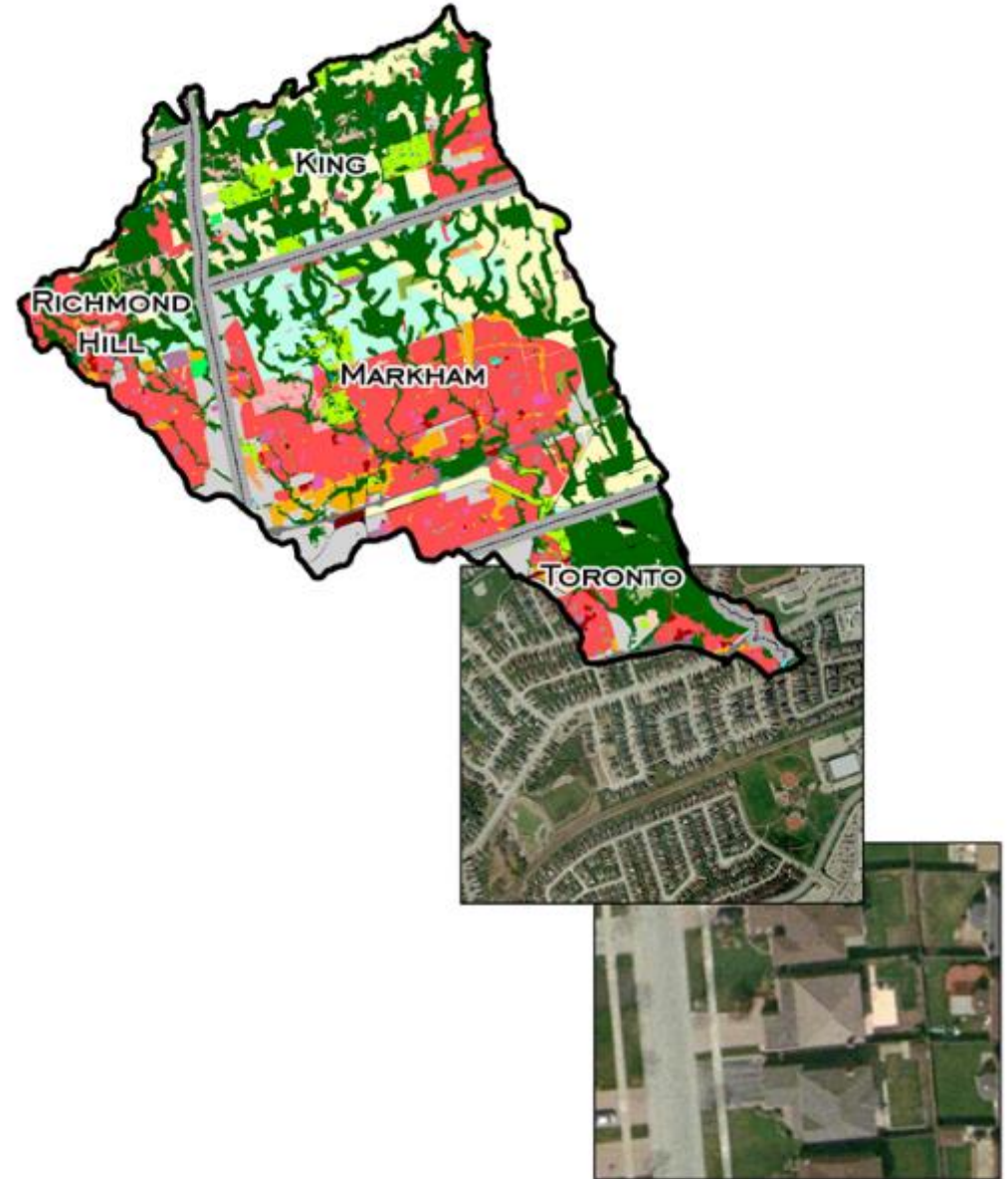
Systems

Services



The Importance of Scale

- Watershed
- Subwatershed
- Catchment or Neighbourhood
- Site / Local



Importance of the Team

- Project Manager
- Technical specialists
- Municipal, Provincial Federal representatives
- NGOs and other Stakeholders
- Steering Committee / Watershed Task Force
- Co-Chairs



Phase 2: Watershed science guides policy, action and decision making



PHASE 2: ANALYSIS & EVALUATION

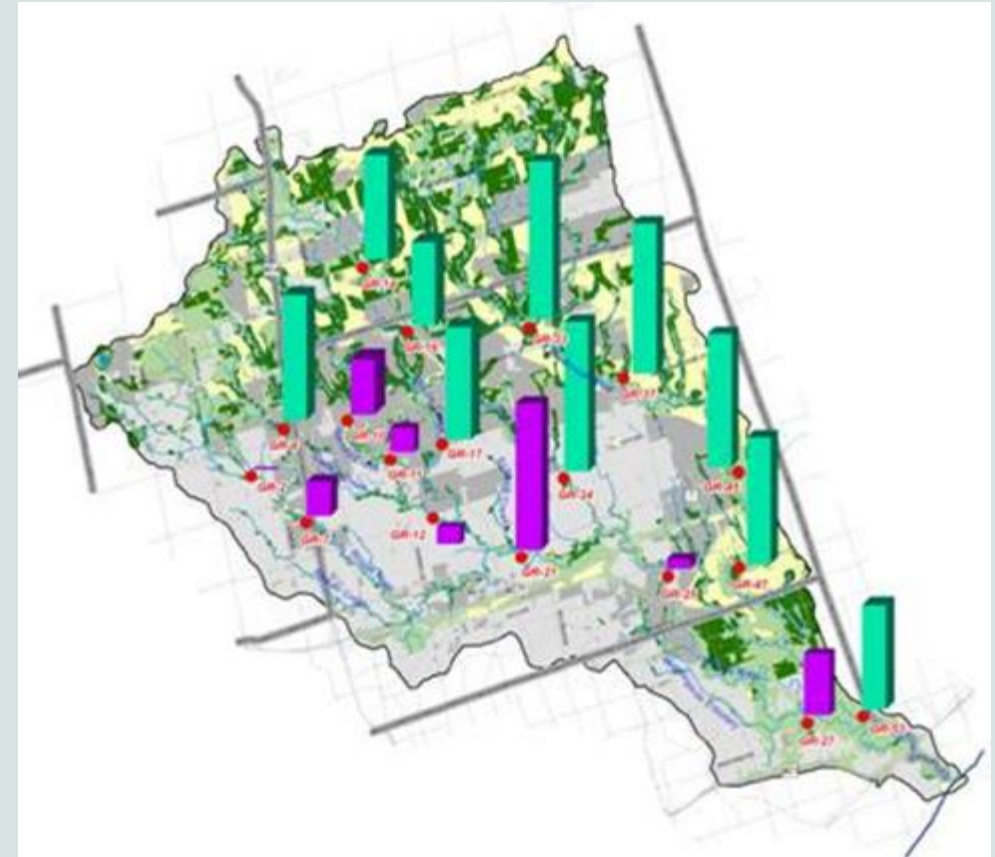
- *Develop management alternatives*
 - *Evaluate management alternatives*
- Existing and future flood vulnerable areas
 - Terrestrial natural heritage systems
 - Existing and future water management needs
 - Mitigation measures required

Phase 3 - Predicting the Future

- Evaluating climate and management scenarios with modelling tools
- Prediction of effectiveness of management actions - how much and where

PHASE 3: WATERSHED PLAN DEVELOPMENT

- *Select preferred management alternatives*
- *Finalize targets*
- *Develop implementation and monitoring plans*

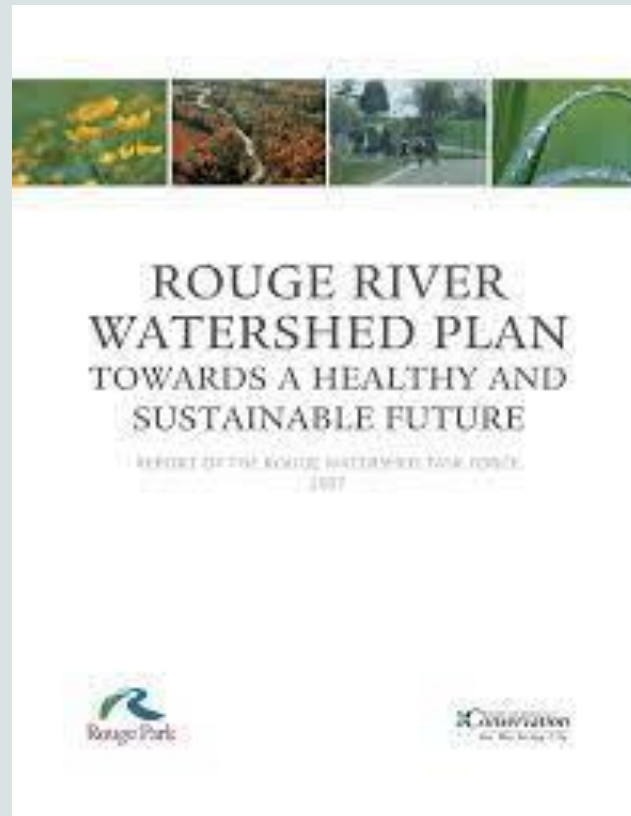


Plan Recommendations – Implementation Tools

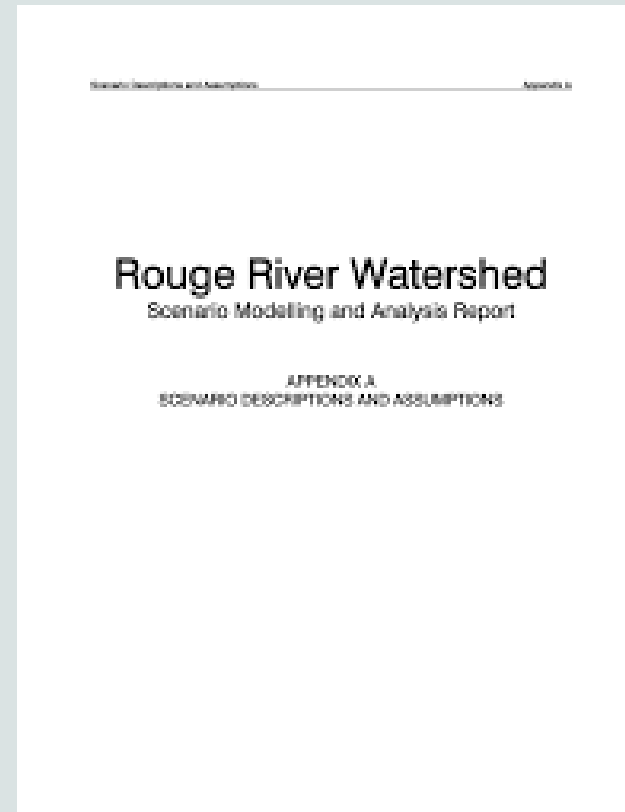


The Watershed Plan Documentation

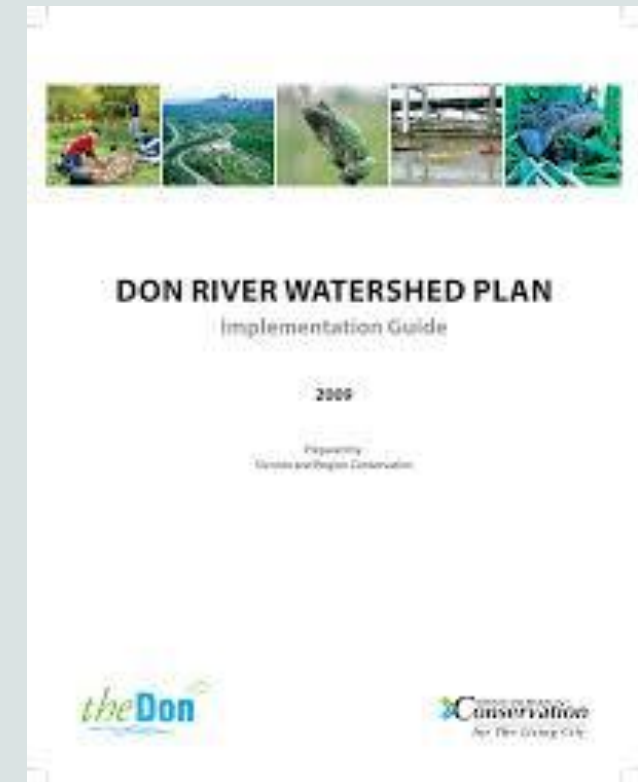
THE PLAN



TECHNICAL DOCUMENTATION



IMPLEMENTATION GUIDE



Legend

- Watercourse
- Piped/Buried Streams
- Municipal Boundary
- Greenbelt Boundary
- Oak Ridges Moraine Boundary
- Pond or Reservoir
- Urban Growth Centre

Potential New & Retrofit Stormwater Ponds

North of Steeles*

- Existing Pond with Retrofit Potential
- Existing Outfall with New Pond Potential

South of Steeles*

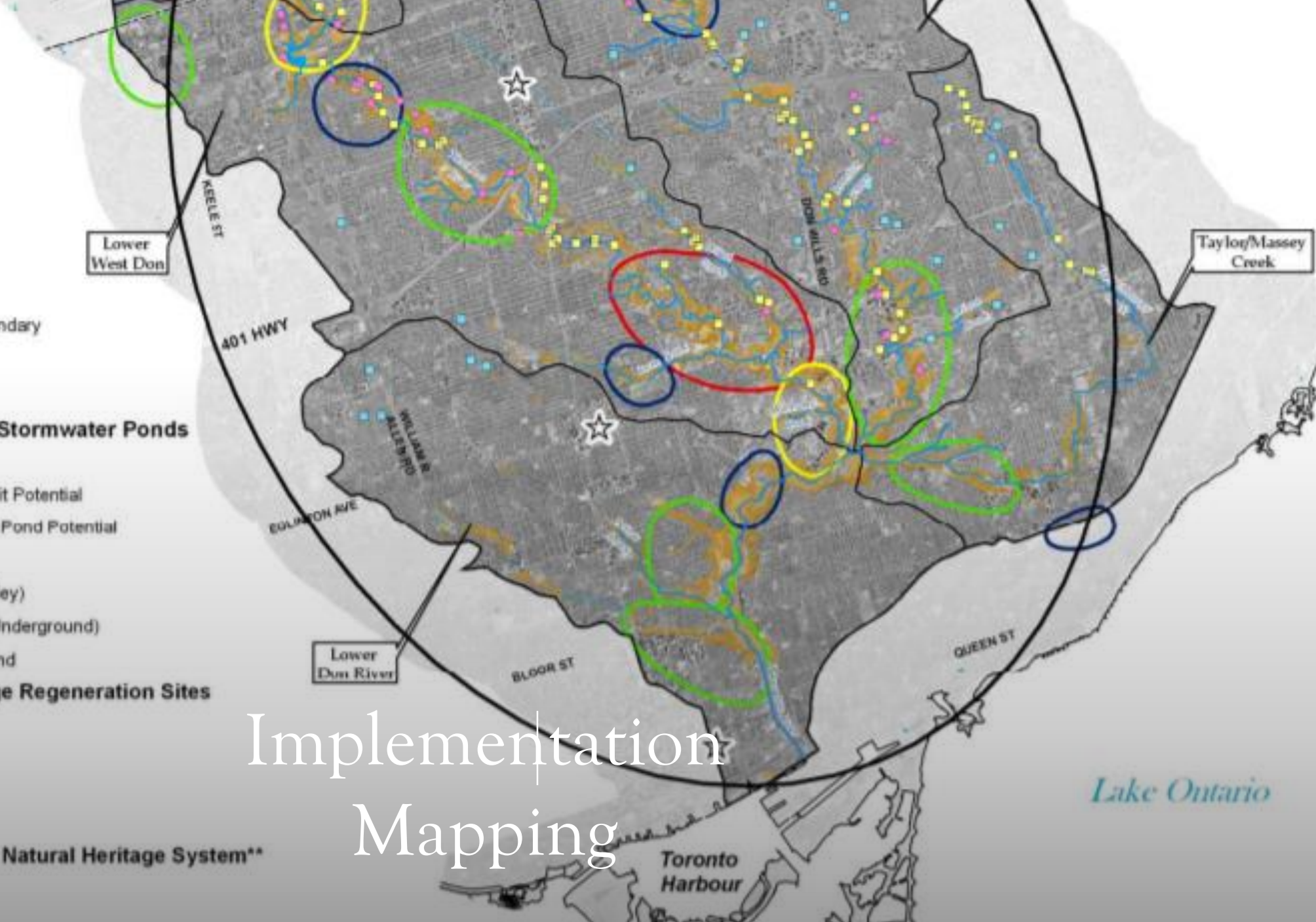
- SWM Ponds (Off-line/Valley)
- Interior SWM Facilities (Underground)
- End Of Pipe - Underground

Terrestrial Natural Heritage Regeneration Sites

- Priority 1
- Priority 2
- Priority 3
- Priority 4

Refined Target Terrestrial Natural Heritage System**

- Existing Natural Cover
- Potential Natural Cover



Implementation
Mapping

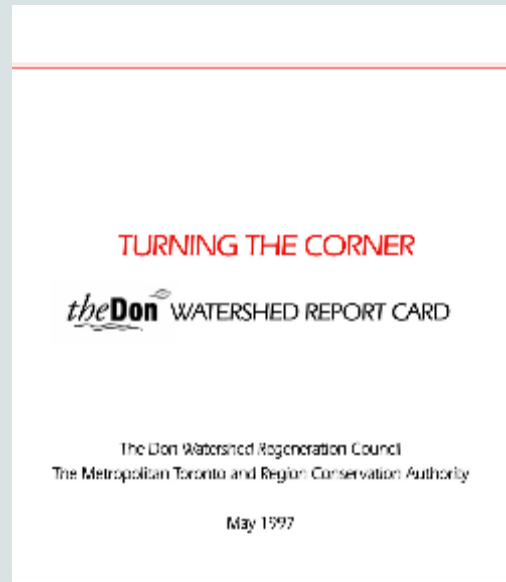
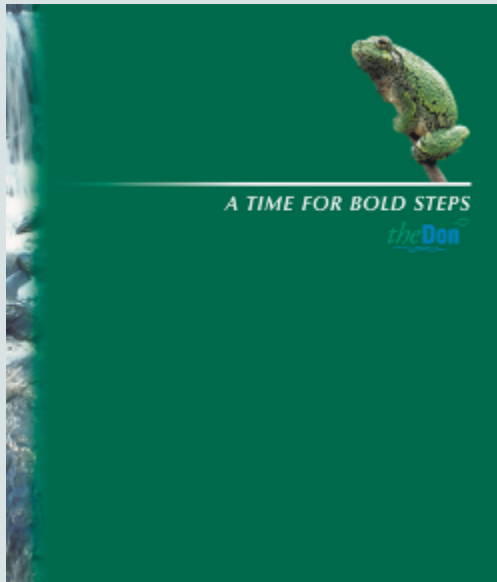
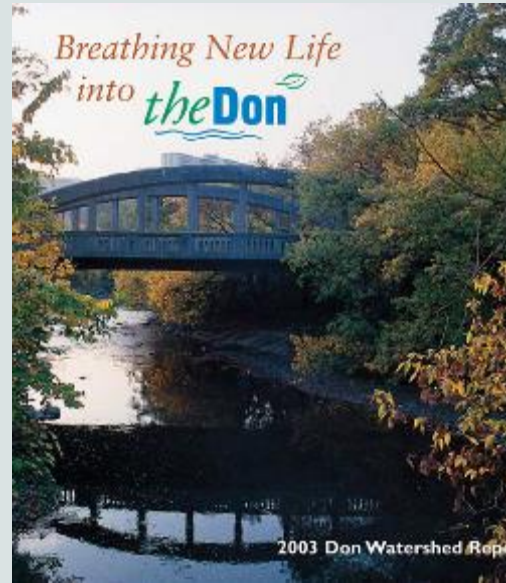
Lake Ontario

Toronto
Harbour




Engagement

- Involving those affected by the plan and its recommendations
- Involving those responsible for implementation of recommendations
- Involve at all phases but 2 and 3 most critical





Monitoring and Reporting

-  Watershed plans take a long time to implement
-  Periodic reporting on implementation keeps interest
-  Monitoring of the watershed to demonstrate progress





Key Take Aways

- An **adaptable process** tailored to each unique watershed
- Provides an integrated **systems understanding** and prediction of cumulative effects, necessary for sound decision-making
- Partnership approach **fosters buy-in and alignment** of efforts
- Engages diverse partners and provides a cross jurisdictional focus which **spurs knowledge sharing, creativity and innovation** to advance policy or practice for emerging issues

The background of the slide is a light gray color. On the left side, there is a decorative pattern of stylized leaves. These leaves are white with thin white outlines and are arranged in a way that they appear to be floating or scattered. Some leaves are simple ovals, while others are more complex, with multiple lobes or segments. The leaves are oriented in various directions, creating a sense of movement and depth.

Thank you

Deborah Martin-Downs

deb.martindowns@cvc.ca

martin_downs@sympatico.ca