DON RIVER WATERSHED PLAN
BEYOND FORTY STEPS

Executive Summary and Introduction to the Implementation Guide

2009

Prepared by:
Toronto and Region Conservation

theDon

TORONTO AND REGION Conservation
for The Living City

Acknowledgements

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For full details, please refer to and reference: Toronto and Region Conservation Authority, 2009. *Don River Watershed Plan.*

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Photo credit: John Wilson

Rupert's Pond, Vaughan

Executive Summary

The *Don River Watershed Plan* builds on the hard-won gains made to date in protecting, regenerating and taking collective responsibility for this abused but still beautiful feature of our natural heritage. It marks the next stage in the revitalization of the Don into a healthy urban river that will enhance and support The Living City of the future.

The plan relies on the working partnerships forged over the last 15 years and maintains momentum for many of the important initiatives launched under our first watershed strategy, *Forty Steps to a New Don*. However, our experience and the insight into the workings of the watershed, gleaned since *Forty Steps* was unveiled back in 1994, have made it clear that we must better focus and prioritize our regeneration efforts in the years ahead.

Our primary challenge will be to better manage wet weather flows and to restore a more balanced flow regime to the river and its tributaries. By managing stream flow, we will also address the root causes of many of the environmental problems that afflict the watershed: ongoing flooding and erosion, poor water quality, and deteriorating aquatic and terrestrial communities.

The Don River flows through the heart of central Canada's urban nexus (Figure 1). From its headwaters on the Oak Ridges Moraine and South Slope, its two principal tributaries flow south through the City of Vaughan and Towns of Markham and Richmond Hill, all in the Regional Municipality of York. The East Don and West Don Rivers cross Steeles Avenue into Toronto and join together on the Iroquois Sand Plain south of Eglinton Avenue.

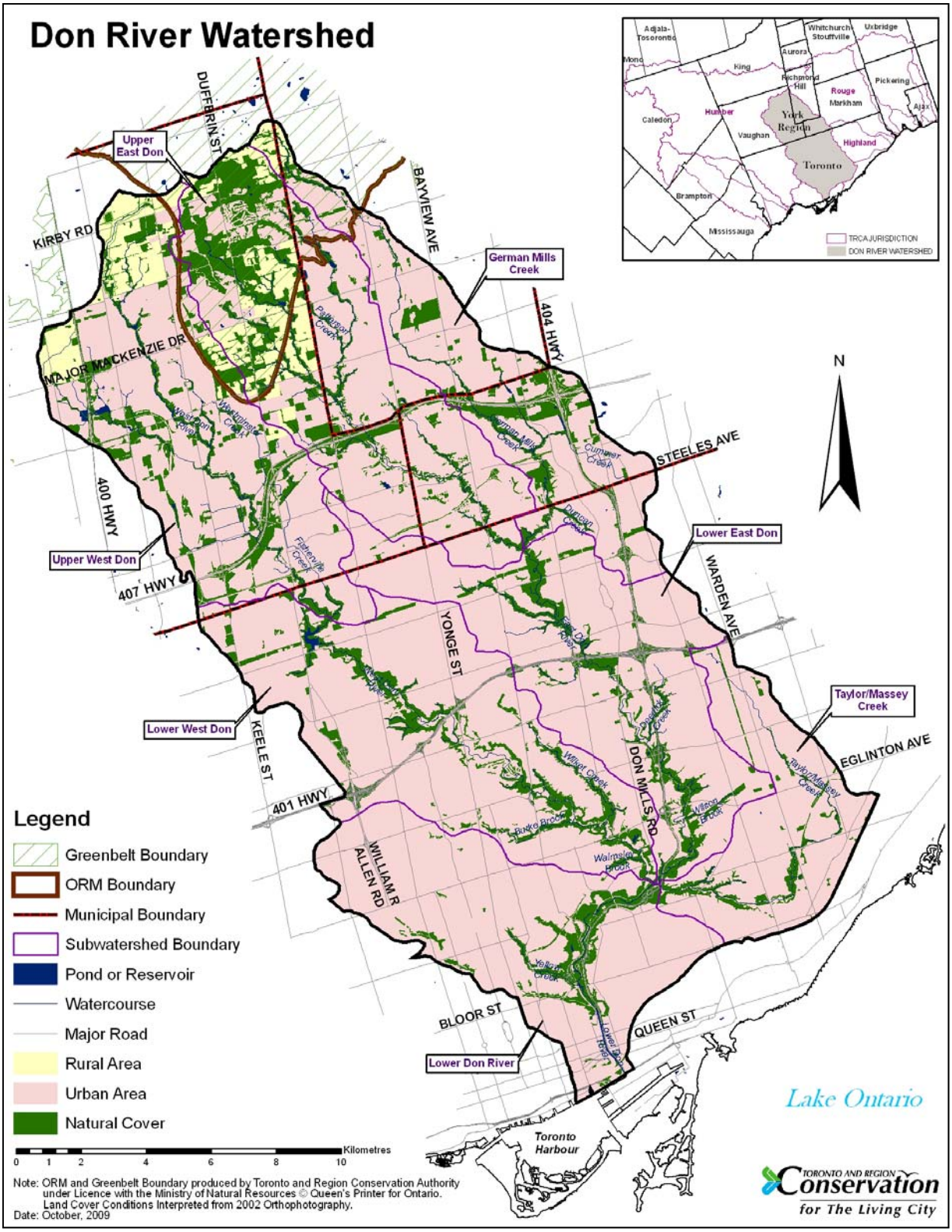
German Mills Creek flows into the East Don River just south of Steeles. Taylor/Massey Creek joins with the East Don River just north of the confluence with the West Don River. And the Lower Don flows south to the outlet of the Keating Channel where it empties into Toronto Harbour and Lake Ontario.

For more than ten thousand years, this network of rivers, streams and valleys has provided an historic highway for the First Nations peoples and, later, the early European explorers, traders and settlers. Subsequent waves of colonization and urbanization have indelibly marked and transformed the aquatic and terrestrial landscape, bequeathing both a rich cultural heritage and some difficult environmental challenges.

Today, almost half of the watershed is devoted to housing, and a fifth to industrial, institutional or commercial development. There is little undeveloped land left. The natural areas and greenspaces of the watershed serve as wildlife refuges and a recreational magnet for the 1.2 million residents that live within its boundaries. Unfortunately, the river also serves as a stormwater conduit, carrying millions of litres of rainwater and snow melt, together with polluted runoff and sewage overflow, south to the lake. And the valley of the lower Don has become a conduit for thousands of cars and trucks heading

Burnett Woods in Toronto (Photo Credit: Kate Hayes)

Figure 1: Don River Watershed



into and out of the urban core every hour of the day and night.

The pressures on the watershed will continue to build as more and more residents settle in the watershed, either in the last areas of greenfield development in the northern reaches, or in the four urban growth centres designated for intensive redevelopment by the Ontario government.

Our review of current conditions in the watershed has helped us plot a path for future action.

The Don River watershed has suffered extensive degradation as natural cover was removed and the hydrologic system altered through the spread of agriculture and subsequent urbanization of the watershed. Lack of stormwater control has resulted in flooding, erosion, poor water quality and degraded terrestrial and aquatic ecosystems. Rising population density has led to expanded areas of impervious cover and heavy use of public greenspaces and natural areas. Concerns about ecological health, the sustainability of our communities, loss of cultural heritage, and the potential impacts of poor air quality and climate change are widespread.

Which brings us to the question, what is the role of this watershed plan?

Specifically, the watershed plan is intended to inform and guide municipalities, provincial and federal governments, TRCA, non-government organizations and private landowners as they update their policies and practices for environmental stewardship. Implementation of these strategies will be most effective if existing partners coordinate their efforts, making creative use of both new and existing tools, as laid out in chapters 5 and 6 of the plan.

This updated watershed plan is part of an adaptive management approach to address the challenges the watershed faces. Since the publication of our first watershed strategy, *Forty Steps to a New Don* in 1994, much has been learned about the watershed from monitoring, research and the experiences of watershed partners. This plan updates the watershed management strategies in *Forty Steps* in light of this new information, a stronger scientific foundation and better understanding of the effects of human actions on the ecosystem.

There is also a need to respond to a number of recent policy and planning initiatives, including the *Oak Ridges Moraine Conservation Plan*, *Growth Plan for the Greater Golden Horseshoe*, *Clean Water Act,* City of Toronto's *Wet Weather Flow Management Master Plan*, stormwater retrofit studies of other municipalities, and TRCA's vision for The Living City.

Our vision for the Don River watershed

The quality of life on Earth is being determined in the rapidly expanding city regions. We envision the future Don as a revitalized urban river, flowing with life-sustaining water through regenerated natural habitats and sustainable human communities, from its headwater tributaries to the mouth of the Don River and into the receiving waters of Lake Ontario. We envision the watershed as an integral contributor to The Living City, where human settlement can flourish forever as part of nature's beauty and diversity.

To help meet our vision for the Don, a set of three guiding principles and 26 objectives were developed.

This guiding framework builds on the principles and objectives presented in *Forty Steps to a New Don* (*see Appendix 2: Guiding Framework*). The three principles which form the basis for the plan are to: protect and sustain what is healthy; regenerate what is degraded; and take responsibility for the Don. We must take advantage of all opportunities to protect and sustain, regenerate and enhance the Don, from the valleys to the tablelands, and from the natural areas to the urban communities. We must also motivate and facilitate, organize and coordinate all the stakeholders, both

public and private sector, throughout the watershed.

The next phase of development and urban intensification provides perhaps a final opportunity to take effective action.

With the build-out of the watershed nearly complete, the Don has been transformed into an almost fully urbanized river. The focus is now shifting from greenfield development towards redevelopment, intensification, infilling and infrastructure renewal to accommodate the anticipated growth of the GTA and neighbouring regions.

This period of urban renewal affords us an opportunity to implement a number of the measures required to restore a more natural water balance in the Don. Stormwater source, conveyance and end-of-pipe controls will contribute to reduced flooding, better water quality, stabilized baseflow levels, increased infiltration and improved groundwater recharge rates. The resulting benefits—reduced erosion and risk to infrastructure and terrestrial and aquatic habitat, and greater flexibility to adapt to climate change—will result in regeneration of a healthier river.

The pathway to a regenerated Don River builds on the following 3 strategic themes (*See Appendix 3: Summary of Recommendations)* **:**

Strategic Theme # 1:

We must build, re-build and retrofit our communities to restore water balance and improve the sustainability of the urban model.

Redevelopment and intensification, and the remaining greenfield development in the Don River watershed, offer opportunities to improve stormwater management, protect and expand natural cover and the urban forest, regenerate greenspaces and cultural heritage structures, expand trail systems, and improve the sustainability of resource use and consumption within our communities. Many of these same opportunities exist through public and private stewardship and capital projects.

In short, we can achieve cumulative gains in watershed function and condition *(see Appendix 4: Priority Areas for Implementation of Stormwater Management).*

Strategic Theme #2:

We must regenerate the aquatic and terrestrial landscapes.

The concerted work of agencies, organizations and individuals have produced some improvements in watershed conditions. Some water quality parameters have improved, hundreds of thousands of trees, bushes and wetland flora have been planted, some in-stream barriers have been mitigated or removed, and trail systems expanded.

However, continued development and urban intensification will place additional pressures on the ecosystems of the watershed. Future gains will be contingent on maintaining the enthusiasm and support of the local community, businesses and government. In addition to ‘sweat equity’, support must include guaranteed funding to cover the significant capital and on-going maintenance costs of the requisite infrastructure *(See Appendix 5: Don River Watershed Regeneration Plan).*

Strategic Theme #3:

We must engage the attention, enthusiasm and support of the people of the Don.

The Don River watershed has a long history of grassroots and agency involvement in and advocacy for regeneration.

Annual celebrations, such as Paddle the Don and the Richmond Hill Mill Pond Splash, as well as major naturalization and brownfield rehabilitation projects in the lower Don engage the community and provide a wider awareness of the Don.

The time is ripe to capitalize on that interest across the watershed, and reengage the people of the Don to achieve the vision of a revitalized urban river. The engagement and voluntary uptake of sustainable practices — backyard naturalization, lot level stormwater retrofits, etc. — by residents and businesses in the Don will be essential to achieving the vision. Outreach education to build understanding of the links between landowner actions and watershed health will be key.

We must build an even stronger sense of community and common purpose, from the mouth to the headwaters. If the public doesn't fight to bring back the Don, the other constituencies eventually will lose interest. The most powerful impetus for change occurs when the whole community comes together and demands action.

Our concept site planning exercise was designed to engage local participants in the watershed study and promote innovative approaches. The five concept site plans provide practical representations of how key watershed recommendations could be applied on a local or neighbourhood basis *(See Appendix 6: Concept Site Plans).* The sites were chosen to be typical of locales throughout the watershed and to be representative of common challenges faced in many locations.

We have been afforded an opportunity to build on what has already been accomplished over the last 15 years.

We must allocate the resources, marshal stakeholder support and take the bold steps necessary to adopt effective stormwater controls and implement sustainable green technologies. Only by doing so can we hope to perpetuate and accelerate the process of cumulative gain and ongoing environmental improvement (*See Appendix 7: Implementation Framework).*

If pursued diligently and with the full support of all our partners, the regeneration of the Don River watershed within The Living City will continue to serve as a model for the salvation of other endangered urban rivers.

Enjoying a day in the Don:
(Left) Paddle the Don participants
(Below) Mountain bikers explore Crothers' Woods

Photo Credit: K. McMahon

Appendix 1: Don Watershed Regeneration Council Members

Don Watershed Regeneration Council Members, 2007-2009

Chair:
Phil Goodwin, resident, City of Toronto

Municipal and Regional Councillors (ex-officio):
Brenda Hogg, Regional Municipality of York
Erin Shapero, Town of Markham
Jack Heath, Town of Markham
Nick Papa, Town of Richmond Hill
Alan Shefman, City of Vaughan
John Parker, City of Toronto, Toronto and Region Conservation Authority Board
Janet Davis, City of Toronto
Norm Kelly, City of Toronto

Public Agencies (ex-officio):
Kristin Geater, Environment Canada
John Almond, Ontario Ministry of Natural Resources

Academic Institutions:
Jennifer Bonnell, PhD Candidate, University of Toronto
Carmela Canzonieri, Professor, York University
Nina-Marie Lister, Professor, Ryerson University

Community Groups:
James McArthur, Friends of the Don East
John Routh, (alternate member) Friends of the Don East
Joe Agg, Richmond Hill Naturalists
Janice Palmer, Task Force to Bring Back the Don
John Wilson, (alternate member) Task Force to Bring Back the Don
Margaret Buchinger, Toronto Green Community
Cheryl Shour, (alternate member), Toronto Green Community

Residents and Business Representatives:
Sue Arndt, resident, City of Toronto
Alex Brunton, Baird & Associates
Shan Dhingra, resident, Town of Richmond Hill
George Fells, resident, City of Toronto
Michael Halder, resident, City of Toronto
Moyra Haney, resident, City of Toronto
Kate Hayes, resident, City of Toronto
Peter Heinz, resident, City of Toronto
Catherine Kurucz, resident, City of Toronto
Vivien Lee, resident, City of Toronto
Brenda Lucas, resident, City of Toronto
Catherine Marsden, Dillon Consulting Limited
Marg McRae, resident, City of Toronto
Douglas Obright, resident, City of Toronto
Leah Weller, CH2M Hill Canada Limited
Andrew Wickens, resident, City of Toronto
David Yudelman, resident, City of Toronto

Municipal Technical Advisory Committee Members

Garth Armour, City of Toronto
Laura Atkins-Paul, Regional Municipality of York
Karen Boniface, Town of Markham
Tony Ching, City of Vaughan
Maria Flores, Town of Richmond Hill
Paul Gardner, City of Vaughan
Janette Harvey, City of Toronto
Tony Iacobelli, City of Vaughan
Sandra Malcic, Regional Municipality of York
Tracy Manolakakis, City of Toronto
Frank Milkovich, City of Vaughan
Learie Miller, Town of Markham
John Nemeth, Town of Richmond Hill
Azadeh Rashvand, Town of Richmond Hill
Soran Sito, Town of Markham
Bill Snodgrass, City of Toronto
Stephanie Snow, City of Vaughan
Jane Weninger, City of Toronto

Observers:
Sandra Kok, Environment Canada
Margaret Buchinger, Don Watershed Regeneration Council
Shan Dhingra, Don Watershed Regeneration Council

For a full list of TRCA and consultant staff who provided technical support to the study, please see Appendix D of the *Don River Watershed Plan*

Appendix 2: Guiding Framework

To help meet our vision for the Don, a set of three guiding principles and 26 objectives were developed. This guiding framework builds on the principles and steps presented in *Forty Steps to a New Don* (MTRCA, 1994), which were updated for this plan to reflect new information and issues, and current approaches to management strategies.

Vision

The quality of life on Earth is being determined in the rapidly expanding city regions. We envision the future Don as a revitalized urban river, flowing with life-sustaining water through regenerated natural habitats and sustainable human communities, from its headwater tributaries to the mouth of the Don River and into the receiving waters of Lake Ontario. We envision the watershed as an integral contributor to The Living City, where human settlement can flourish forever as part of nature's beauty and diversity.

Principles

We must take advantage of all opportunities to protect, regenerate and enhance the Don, from the valleys to the tablelands, and from the natural areas to the urban communities. The following regeneration principles, based on those laid out in *Forty Steps to a New Don*, should serve to guide future regeneration of the Don River watershed.

Principle #1: Protect and sustain what is healthy

- ❒ Protect the natural sources of the Don River: its headwaters, groundwaters, creeks and tributaries.
- ❒ Protect the natural linkages that still exist in the Don, its diverse habitats, and the wild life in them.

Principle #2: Regenerate what is degraded

- ❒ Restore the river and its tributaries through actions that re-establish or mimic the natural patterns of the watercourse.
- ❒ Restore clean, life-sustaining water to the river and its tributaries.
- ❒ Nurture degraded habitats backs to health, and reconnect them to each other and to nearby human communities.
- ❒ Restore important reminders of the Don's historical past and encourage activities that reflect our cultural diversity.
- ❒ Require all projects to improve the health of the natural system.

Principle #3: Take responsibility for the Don

- ❒ Be a steward and contribute to a healthy, sustainable natural environment in all daily activities.
- ❒ Help neighbours, governments, and businesses work together to regenerate the Don.
- ❒ Visit the Don and share our enjoyment with others.

Charles Sauriol Reserve in Toronto (Photo credit: John Wilson)

Objectives

The objectives of this plan are grouped under four headings: Caring for Water, Caring for Nature, Caring for Community, and Getting it Done. Associated with the objectives for water, nature and community are indicators and targets for watershed conditions (*see Chapter 3 in the Don River Watershed Plan*).

Caring for Water

1. Protect and restore the quantity and quality of groundwater.
2. Protect and restore the natural variability of annual and seasonal stream flow.
3. Maintain and restore natural levels of baseflow.
4. Eliminate or minimize risks to human life and property due to flooding.
5. Manage stormwater to protect people and health of streams and rivers.
6. Protect and restore surface water quality with respect to toxic contaminants and other pollutants, such as sediment, nutrients, bacteria and road salt.
7. Protect and regenerate the natural form and function of the Don's valley and stream corridors.

Caring for Nature

8. Reduce air pollution to levels that protect human health and natural ecosystems, and do not exacerbate global climate change.
9. Protect, regenerate and enhance the health and diversity of native aquatic habitats, communities and species.
10. Protect and expand the Terrestrial Natural Heritage System and improve connectivity among the watershed's forests, meadows, and wetlands.
11. Regenerate the health of natural areas, and the whole urban landscape, to improve their quality, biodiversity, and ecological function.
12. Manage the impact of human activities and neighbouring land uses in the watershed.

Caring for Community

13. Improve sustainability in urban form at community and building site scales.
14. Practice sustainable resource use by individuals, households, businesses, institutions and governments.
15. Connect people and places in the Don River watershed.
16. Protect and regenerate natural areas and greenspaces for nature-based experiences.
17. Celebrate the natural and cultural heritage of the Don River watershed.
18. Identify, document, protect and celebrate the cultural and heritage resources of the watershed.

Getting it Done

19. Use the Subwatershed Regeneration Plans to integrate and coordinate local regeneration efforts.
20. Encourage grassroots regeneration groups throughout the watershed.
21. Encourage staff at agencies and municipalities to take responsibility for the Don.
22. Fund the Don's regeneration through existing and new sources.
23. Research the effectiveness of different technologies and approaches for regenerating urban watersheds.
24. Undertake demonstration projects throughout the watershed.
25. Make changes in our personal lifestyles and government actions that will help protect and regenerate the Don and the larger ecosystems of which it is a part.
26. Use education, awareness, stewardship and social marketing tools to accelerate regeneration of the Don.

Volunteers are a valuable resource in the regeneration of the Don River Watershed.
(Photo credit: Kate Hayes)

Appendix 3: Summary of Recommendations

CARING FOR WATER (Section 5.1)

1. Implement source, conveyance and end-of-pipe stormwater management facilities (retrofit and new) and maintain existing stormwater facilities across the watershed
2. Manage flood risks
3. Protect groundwater recharge and discharge areas
4. Improve erosion and sediment control and site regeneration
5. Improve stream form
6. Prevent and remediate pollution
7. Monitor, evaluate and adjust

CARING FOR NATURE—AQUATIC SYSTEM (Section 5.2.1)

1. Implement Redside Dace Recovery Team recommendations (in development) to investigate the existing redside dace population status and habitat improvement and protection opportunities (in Fish Management Zones (FMZ) 1 where this species is currently known to occur and in FMZs 2 and 3 where a population may be recovered)
2. Protect and improve instream habitat for the Target Community Indicator Species (Figure 25 in the *DRWP*), as per recommendations in Chapter 6 of this watershed plan and the Fisheries Management Plan (FMP)
3. Create or enhance riparian wetlands, with focus on reaches that still support aquatic communities that rely on this habitat (e.g., known populations of brassy minnow), as per recommendations in Chapter 6 of this watershed plan and the FMP
4. Complete an instream barrier assessment for the entire watershed and identify priority barrier mitigations that would achieve the most improvement to fish passage and habitat
5. Improve the water balance (surface water and groundwater regimes) and stormwater management (quality and quantity), and identify aquatic standards and best management practices to guide the work (see management strategies under Caring for Water in Section 5.1)
6. Establish an Implementation Committee for the updated Don River Fisheries Management Plan
7. Improve monitoring of fish communities and habitat, particularly for existing populations of redside dace and walleye
8. Develop education and stewardship programs to address invasive species awareness (round goby, common carp, rusty crayfish) and the potential for invasive species transfer between watersheds (e.g., bait fish transfer between Humber and Don rivers), the role of fish as indicators of riverine health, and best management practices to protect and regenerate the aquatic system (especially riparian plantings) targeted at landowners and land maintenance staff

CARING FOR NATURE—TERRESTRIAL SYSTEM (Section 5.2.2)

1. Improve ecological function of the entire urban landscape, from the natural areas to the built areas, by increasing vegetation cover through better urban design and land management
2. Secure the Target Terrestrial Natural Heritage System (Figure 26 in the *DRWP*) and look for additional opportunities for expansion (e.g., additional lands identified in City of Toronto's Official Plan, Map 9)
3. Regenerate and enhance the quality of the natural system by increasing natural cover quantity, improving patch size and shape, and managing invasive species
4. Mitigate the impact of human activities on natural areas by developing a broader understanding of ecosystem health and a commitment to stewardship among the public and businesses

CARING FOR COMMUNITY—CULTURAL HERITAGE (Section 5.3.1)

1. Identify, investigate and conserve cultural heritage prior to changes in land use or redevelopment
2. Establish a comprehensive communication plan with Aboriginal (First Nations and Métis) groups and other more recent descendant populations
3. Fill gaps in archaeological knowledge
4. Develop and support existing active and participatory programs to increase awareness of cultural heritage and living culture

CARING FOR COMMUNITY—NATURE-BASED EXPERIENCES (Section 5.3.2)

1. Protect and enhance the quality and extent of public greenspaces throughout the watershed, and, in particular, in areas of increasing population density and redevelopment
2. Expand the network of formal trails to connect key destinations and improve connectivity with neighbouring watersheds, the Oak Ridges Moraine, and the waterfront
3. Promote the natural and cultural heritage of the watershed and engage the community in their protection, regeneration, and celebration

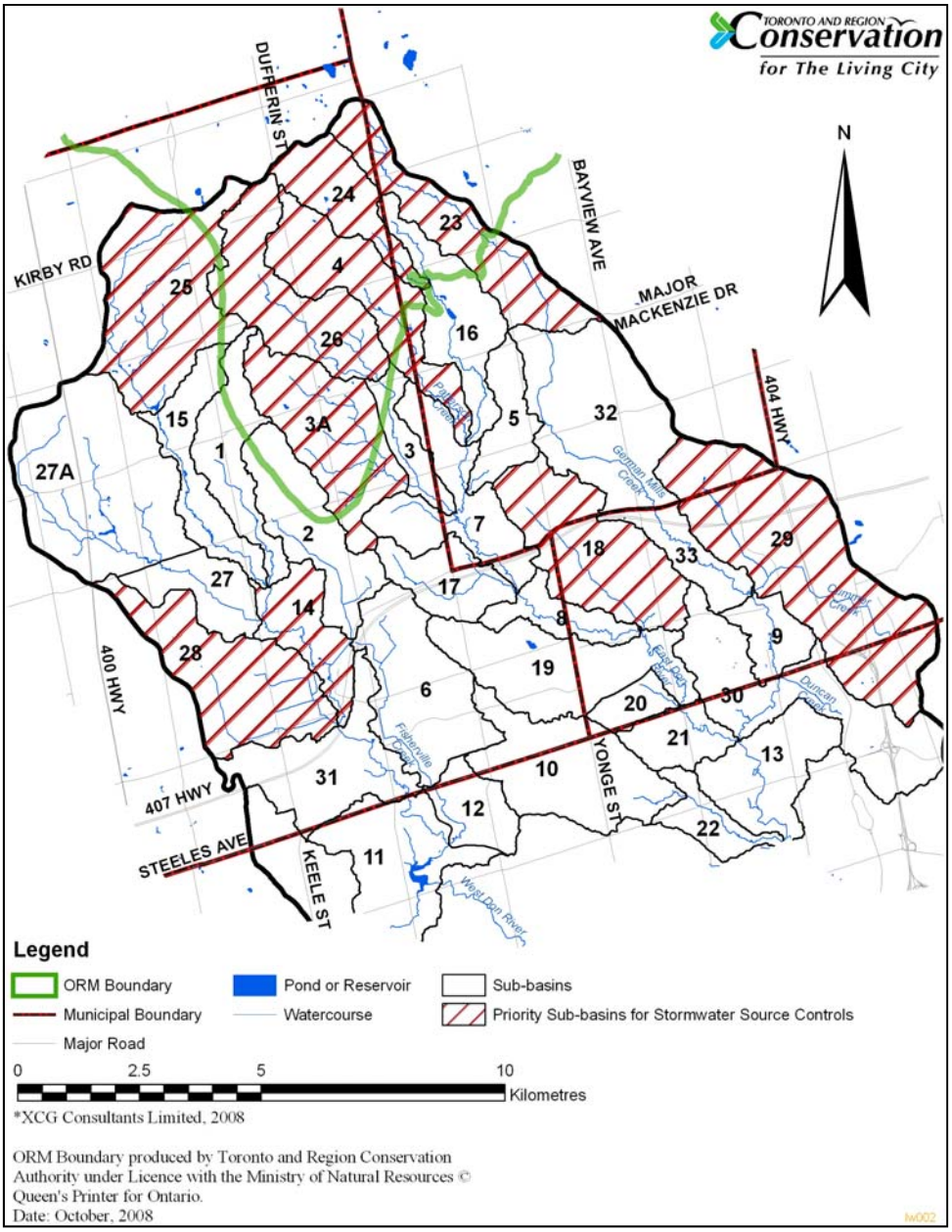
CARING FOR COMMUNITY—LAND AND RESOURCE USE (Section 5.3.3)

1. As municipal Official Plans are updated across Don watershed municipalities, TRCA should work with municipalities to incorporate watershed plan strategies into these plans and to encourage strategic planning in advance of redevelopment, to enhance the sustainability of urban form and resource use
2. Master Environmental Servicing Plans (MESPs) for Redevelopment areas and regeneration areas should be required to coordinate property redevelopment and regeneration in a comprehensive way
3. Implement sustainable urban form and adopt green development standards for neighbourhoods, sites, and buildings
4. Improve planning for and continue implementation of flood remediation
5. Terrestrial natural cover on historical lots of record that extend into ravines should be protected from loss during redevelopment or intensification by designating it “open space” in municipal official plans
6. Explore opportunities to secure financial resources for creating new greenspaces and supporting regeneration, operations and maintenance of existing greenspaces from development charges when areas are subject to growth through intensification
7. Implement sustainable infrastructure planning, implementation and monitoring
8. Increase water efficiency and conservation
9. Reduce energy use and increase non-fossil fuel alternatives
10. The amount of waste generated should be reduced and wherever possible, “waste” should be used as a resource

Appendix 4: Priority Areas for Implementation of Stormwater Management

To help develop an understanding of how the watershed might react to changes in environmental practices and land use in the future, two potential future scenarios were developed, modelled and analyzed, to compare their impacts on watershed conditions and assess the relative effectiveness of management approaches. The modelling focused on the portion of the watershed north of Steeles Avenue, as the City of Toronto's *Wet Weather Flow Management Master Plan* (WWFMMP) (MMM, 2003) incorporated extensive modelling of the Don watershed south of Steeles Avenue (*see Chapter 5 of the Don River Watershed Plan for a summary of priorities*).

The first future land use scenario included existing (2005) land uses and full build-out of approved development as per existing official plans, including a partial build-out of the "whitebelt" lands not protected by the *Greenbelt Plan* and *Oak Ridges Moraine Conservation Plan*. In a second sustainable community scenario environmental measures, such as enhanced stormwater management and protection and expansion of natural cover, were super-imposed on the future land use scenario.



Results of the modelling indicated that the sustainable community scenario could result in reductions in peak stream flows, moderate reductions or more modest increases in erosion potential and improved water quality as compared to the conventional future scenario. The results of the modelling, combined with an assessment of sensitive habitats has helped to identify priority sub-basins in the 905 area of the Don for implementation of stormwater source controls (i.e. rain harvesting, greenroof technology, infiltration galleries. *See Figure 4-1*). These actions will help to protect aquatic habitat for indicator species, protect regionally significant groundwater recharge and mitigate watercourse erosion and flood risk. This work complements work done by the City of Toronto for the *Wet Weather Flow Management Master Plan (See Figure 4-2).*

Figure 4-1: Priority Basins for Implementation of "At Source" Stormwater Management in the Upper Don

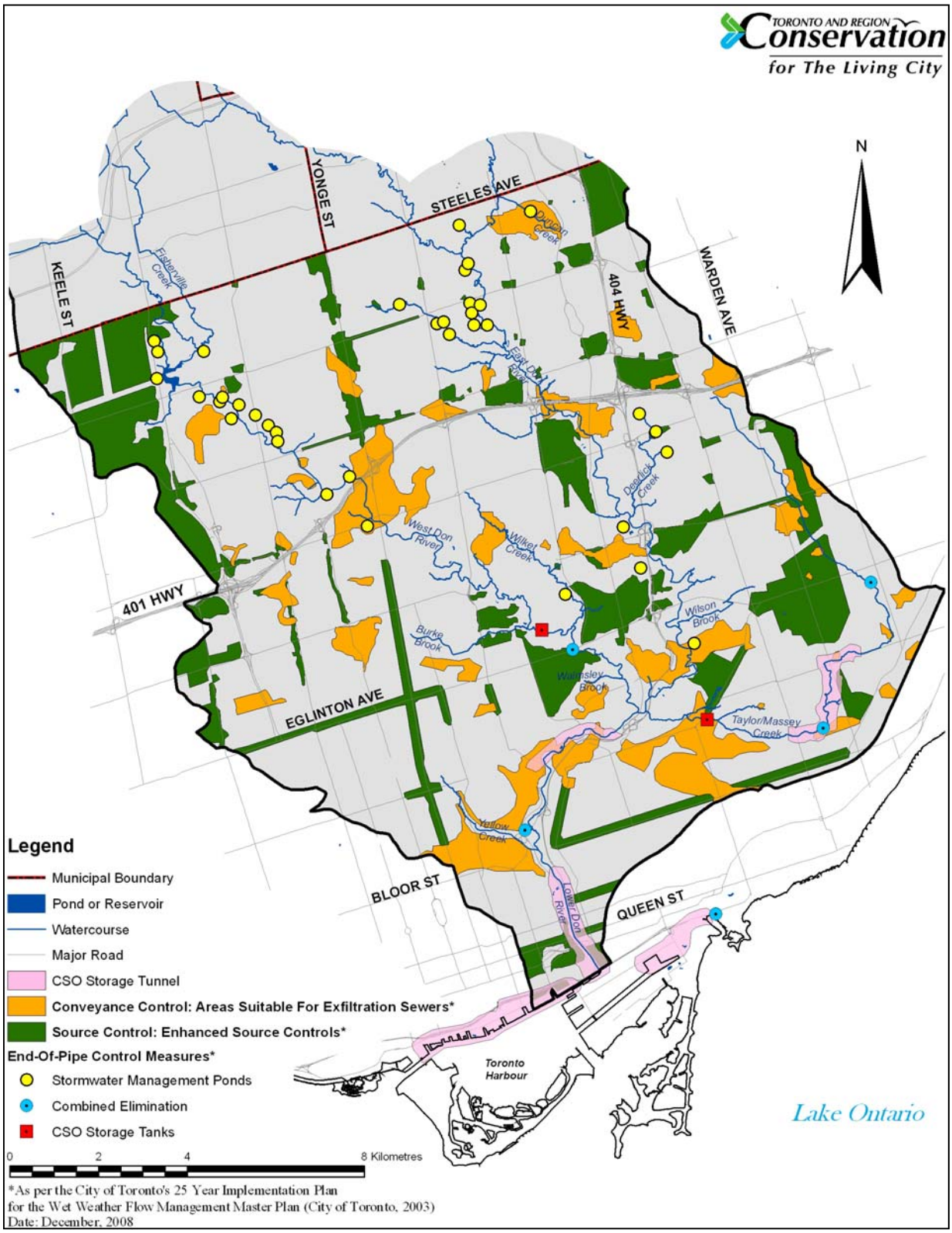
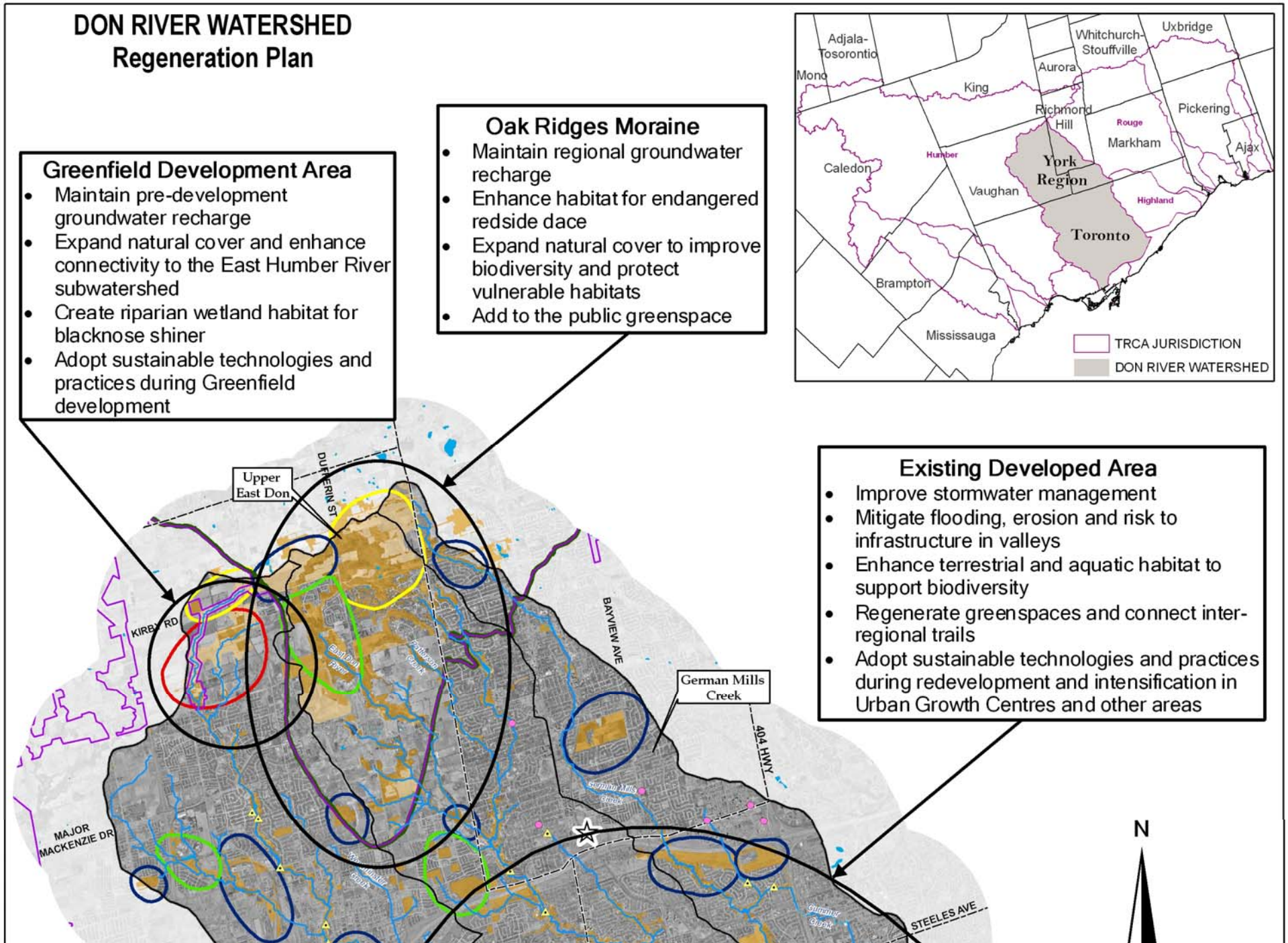
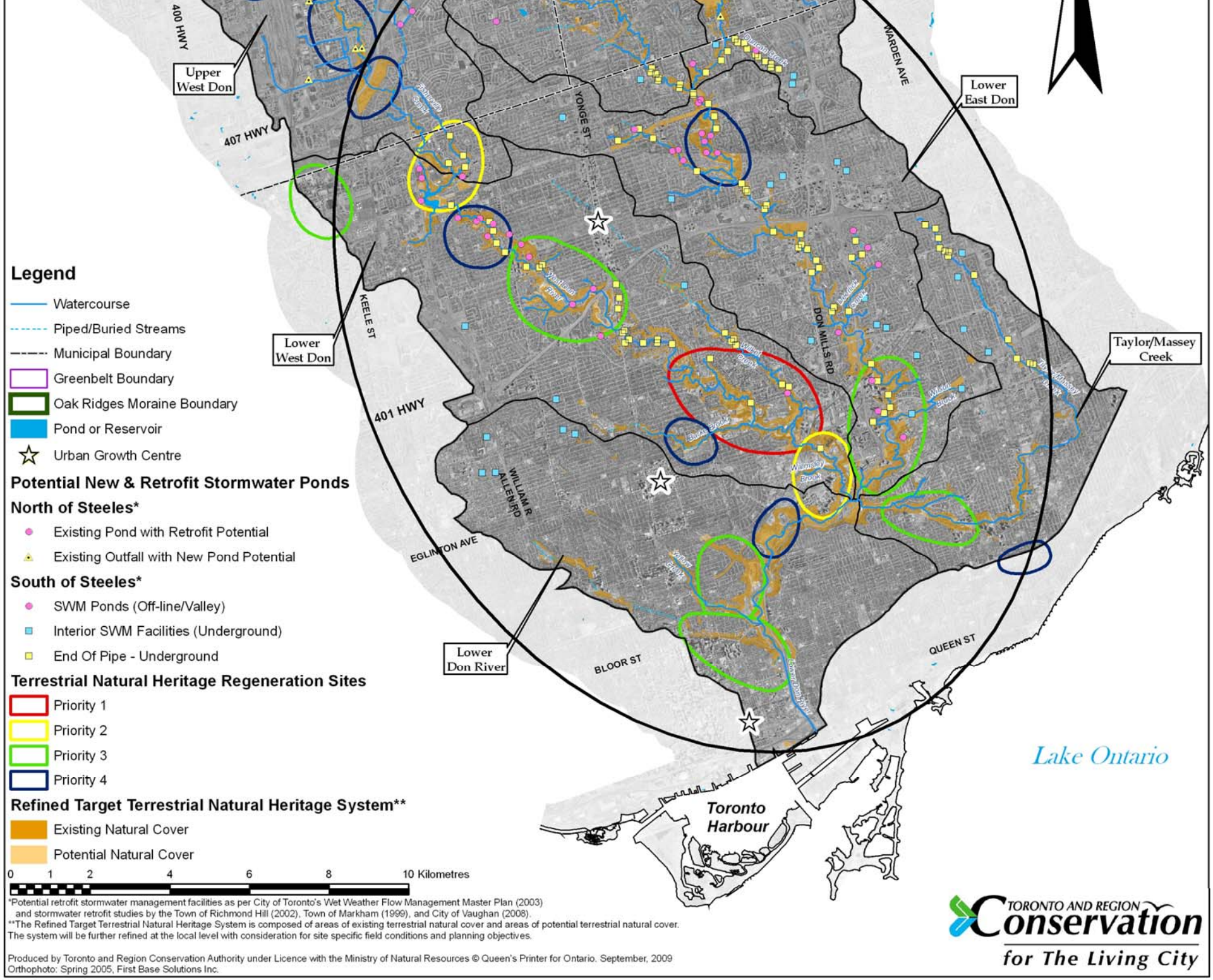


Figure 4-2 Priority areas for Implementation of City of Toronto's Wet Weather Flow Management Master Plan

Appendix 5: Don River Watershed Regeneration Plan





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

0 1 2 4 6 8 10 Kilometres

*Potential retrofit stormwater management facilities as per City of Toronto's Wet Weather Flow Management Master Plan (2003) and stormwater retrofit studies by the Town of Richmond Hill (2002), Town of Markham (1999), and City of Vaughan (2008).

**The Refined Target Terrestrial Natural Heritage System is composed of areas of existing terrestrial natural cover and areas of potential terrestrial natural cover. The system will be further refined at the local level with consideration for site specific field conditions and planning objectives.

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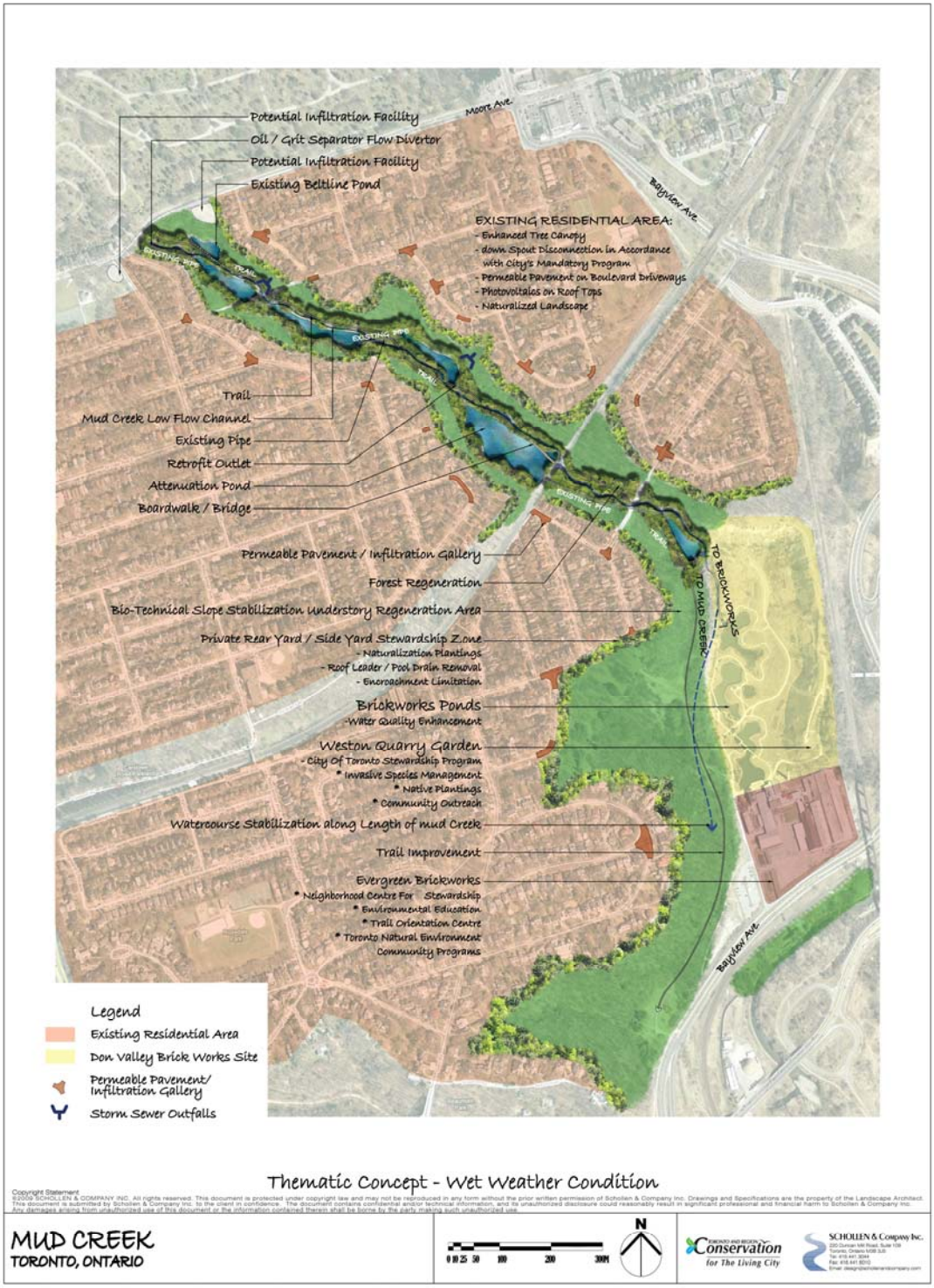
Appendix 6: Concept Site Plans

Concept Site #1: Ravine Challenges—Mud Creek, Toronto

The erosion problems evident in Mud Creek — caused by ineffective stormwater control and exacerbated by heavy pedestrian traffic on formal and informal trails and the actions of neighbouring homeowners — are typical of those seen in many other ravines throughout the lower part of the watershed.



The concept site plan would address wet weather flow control by creating a series of flow regulating structures and water holding ponds (attenuation areas) upstream of each piped segment of the creek. In addition, a new surface baseflow channel would be created along the entire length of the ravine. The currently deteriorating gabions along the exposed stream banks would be replaced with biotechnical stabilization works such as stone inlaid with vegetation, and the failed grade control structures near the Don Valley Brick Works site would be replaced and upgraded. A number of additional initiatives would be undertaken to increase the ravine's biodiversity, improve the trail system, protect at-risk environmental components, and expand public outreach through interpretive signage. These on-site solutions would be reinforced through community outreach and education initiatives designed to manage stormwater at the lot level on neighbouring properties and eliminate encroachment.

Concept Site #2: Regenerating Natural Heritage

The 'Quonset Hut', Vaughan

The rehabilitation of this site in the Maple Nature Reserve offers an opportunity to enhance the watershed's natural cover and restore aquatic habitat, while integrating additional recreation and environmental education features for local residents. The site plan illustrates how naturalization efforts can create valuable wildlife habitat and expand the traditional amenities provided by urban parklands.

The Quonset hut and the associated wood-framed buildings on the site of a former forest research station would be demolished and the site restored to enhance local biodiversity and complement the surrounding Maple Uplands Environmental Significant Area (ESA) in Vaughan. The Quonset hut site is located on the edge of a "core forest" and the initiative would add approximately one hectare of additional forest habitat, expanding the core area to more than 10 hectares. Regeneration of the site would also entail the grading of the property to restore the original undulating topography, the creation of several small ponds, wetlands, thickets and forested areas, and the construction of associated trails, viewing areas and interpretive signage. The restored habitat would provide additional breeding grounds for amphibians, including wood frogs, support rare plant species and interior-forest birds. To engage the growing community around this site, the City of Vaughan and TRCA would undertake a number of outreach and community stewardship initiatives to raise awareness of the ecological significance of the reserve and the role they play in ensuring its protection.

Preliminary Concept Plan

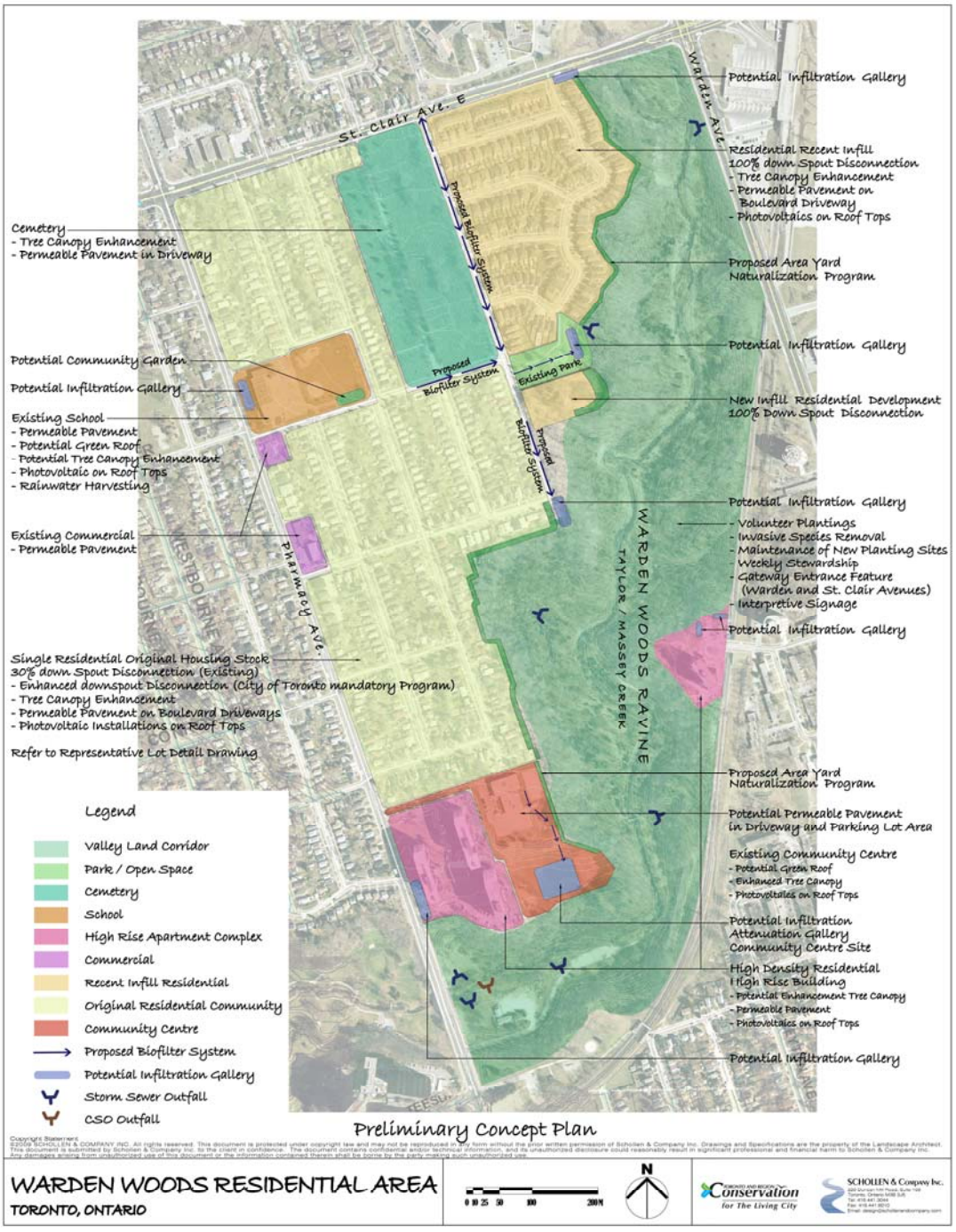
QUONSET HUT SITE REGENERATION
MAPLE NATURE RESERVE,
VAUGHAN, ONTARIO

Concept Site #3: Building Sustainable Neighbourhoods

Warden Woods Residential Area, Toronto

The 1950s suburban single family housing that covers much of the Warden Woods area is typical of many older residential areas throughout the watershed. The concept site plan will showcase how such older housing stock can be made more sustainable by improving energy efficiency and water conservation, and implementing other green retrofits.

Diverting stormwater from the combined sewer system will also reduce overflows into Taylor/Massey Creek, mitigate erosion and improve downstream water quality. Under the site plan, improved stormwater management and water infiltration/ attenuation techniques would be implemented. The valley parks and other natural areas would be protected and regenerated to restore ecosystem functionality and improve community enjoyment. In addition to promoting a more sustainable community, the site plan would: restore vegetation and enhance the tree canopy; mitigate the urban heat island effect; enhance public awareness of environmental/conservation practices; and improve the streetscape and pedestrian realms.



Concept Site #4: A Sustainability Makeover

Generic Commercial / Industrial Area

The generic commercial / industrial site is representative of many sites throughout the watershed built prior to the establishment of current standards for sustainability. Many of these aging sites are due for redevelopment, presenting an excellent opportunity to work with private sector and municipal partners to give these sites a sustainability makeover. TRCA will continue to search for a suitable demonstration site to implement the concept site plan in partnership with local business groups and the municipality.

The concept plan is focused on rebuilding/retrofitting the study area to restore water balance, mitigate flooding, improve water quality and enhance overall environmental sustainability. The plan addresses the needs of a generic industrial park, typical of many across the watershed, that were built in the 1960s without consideration of modern stormwater management or energy efficiency standards. Many of these areas are currently in transition, with facilities being upgraded and retrofitted to meet modern business requirements. The remaking of an aged, inefficient industrial area will demonstrate the feasibility and benefits of both modest retrofits and bold planning moves in achieving water balance and environmental sustainability objectives.

Concept Site #5: Taking Bold Steps[1]

The entire Lower Don Lands are in the process of being transformed into an urban estuary and sustainable "green" city district where city, lake and river will interact in a dynamic and balanced relationship. In addition, the Don Narrows will be naturalized, flooding problems will be minimized, and the public will regain access to a revitalized swathe of its waterfront heritage.

Innovative ecological regeneration practices and sustainable city building models will be employed to rehabilitate the underutilized and largely desolate brownfield area. Plans include re-naturalizing the Don River mouth, re-routing it to address flood protection, and creating wetlands and natural green spaces in a new urban estuary. The revitalized river will be the centerpiece of a new sustainable community offering an integrated mix of open space, housing, green businesses and institutional infrastructure. Connections to the surrounding city will be enhanced by a network of pedestrian, bike, transit and vehicular right of ways. New bridges, waterways and a continuous riverfront park system will provide strong linkages to the Don River Park, the Martin Goodman Trail, and the Don River trail system.

Current (Top) and Prospective (Bottom) Views of the Lower Don Lands: This artist's rendering is an aerial view from the approximate position of the CN Tower facing southwest. It shows the revitalized Keating Channel Precinct and to the south, the newly developed Don River Park system and re-naturalized mouth of the Don. In the distance, the Leslie Street Spit lies beyond the Outer Harbour.

Credit: Renderings are property of Waterfront Toronto

[1] – The plan for the Mouth of the Don concept site has been developed independently of the other four sites as a part of a larger initiative to revitalize the Toronto waterfront and remediate chronic flooding concerns.

Appendix 7: Don River Watershed Plan Implementation Framework

The purpose of the *Implementation Guide* is to facilitate implementation of the recommendations contained in the *Don River Watershed Plan* (TRCA, 2009). The Guide organizes the watershed plan recommendations according to relevant implementation tools and assembles additional information to inform initial action. The Guide further summarizes a 10 year work plan of implementation projects, within the context of existing programs and likely implementing partners. Like the watershed plan the *Implementation Guide* is intended to inform and guide the ongoing implementation and development of programs and policies. **The proposed projects contained in this Guide are intended to serve as a basis for discussion among implementing partners and as a source for the further development of individual partners' own long term work plan and budget preparations.**

Strategic Watershed Management Direction

The *Don River Watershed Plan* concludes that we are beginning to "hold the line" on further degradation of the watershed. Going forward, our primary challenge will be to better manage wet weather flows and to restore a more balanced flow regime to the river and its tributaries. This will be especially important for mitigating the impacts of climate change on this highly urbanized water system. The watershed plan identifies three strategic themes for the regeneration of the watershed:

Build, re-build and retrofit our communities to restore water balance and improve sustainability.

The *Don River Watershed Plan*, especially the wet weather flow control aspects of the Plan, must be implemented during redevelopment and infilling projects, retrofit of existing built areas, and development of the remaining greenfield areas. Balancing the flow regime of the Don and its tributaries through stormwater source controls will yield a number of associated benefits. The reduction of peak flows following storms and the maintenance of adequate baseflow between events will reduce the risk of flooding and erosion related damage, while supporting the protection and regeneration of healthy aquatic and terrestrial habitats. Redevelopment throughout the watershed will also provide additional opportunities to protect greenspaces and cultural heritage structures, expand the trail system and urban tree canopy, undertake energy and water conservation improvements, and, otherwise, achieve incremental, cumulative gains in watershed function and condition.

Regenerate the aquatic and terrestrial landscapes.

The concerted work of agencies, organizations and individuals has produced improvements in watershed conditions. Some water quality parameters have improved, tens of thousands of trees and aquatic flora have been planted, a number of in-stream barriers to fish have been removed, and trail systems have expanded. There is a continued desire to improve watershed conditions, contribute to de-listing the Toronto Area of Concern (RAP), and regenerate the Mouth of the Don into an internationally recognized example of a healthy urban river. However, continued development and urban intensification, coupled with the impacts of climate change will place additional pressures on the ecosystems of the watershed. Future gains will be contingent on maintaining the enthusiasm and support of the local community, businesses and government for regeneration actions. In addition to 'sweat equity', support must include guaranteed funding to cover the significant capital and on-going maintenance costs of the requisite infrastructure.

Engage the people of the Don.

The Don River watershed has a long history of grassroots and agency involvement in and advocacy for regeneration. Annual celebrations, such as Paddle the Don and the Richmond Hill Mill Pond Splash, as well as major naturalization and brownfield rehabilitation projects in the lower Don engage the community and provide a wider awareness of the Don. The time is ripe to capitalize on that interest across the watershed, and reengage the people of the Don to achieve the vision of a revitalized urban river. The engagement and voluntary uptake of sustainable practices — backyard naturalization, lot level stormwater retrofits, water and energy conservation and many others — by residents and businesses in the Don will be essential to achieving the vision. Stewardship and outreach education to build understanding of the links between landowner actions and watershed health will be key.

Top Priority Implementation Projects

This *Implementation Guide* identifies a 10 year work plan of proposed implementation projects addressing all recommendations of the watershed plan, and organized according to primary implementation mechanisms:

Policy;
Regeneration;
Land securement;
Stewardship and outreach education;
Operations and maintenance;
Enforcement; and
Monitoring.

The following list of top priority implementation projects has been selected with consideration for their collective ability to address the three integral actions noted above, in an expeditious and mutually supportive way. They are not listed in any particular order. The reference numbers in brackets (i.e., 1-8) are the respective project numbers, as listed in the implementation work plan tables within the main body of the *Implementation Guide*.

Policy and Policy Related Special Studies

1. Municipalities - Work with TRCA to investigate ways to incorporate the following new policy directions into municipal planning documents (see Table 1.1 for details) (1-1):
    a. All redevelopment should aim to manage for **improved water balance** on the development site and net gain in stormwater control across the larger redevelopment area; all greenfield development should aim to maintain pre-development volumes of infiltration, evapotranspiration and surface runoff, with particular emphasis on areas identified as having **significant groundwater recharge**.
    b. Support **retrofits of source/lot level, conveyance and end of pipe stormwater management measures** in existing developments and redevelopment projects on a comprehensive basis.
    c. Require **Master Environmental Servicing Plans** (MESPs) to be undertaken in conjunction with planning for **urban redevelopment**, including redevelopment in the four provincially designated Urban Growth Centres, municipally identified redevelopment areas, major infrastructure projects, and major regeneration projects.

a. Develop strategies and policies to promote **sustainable urban form**, including sustainable infrastructure, transportation and energy and resource conservation, at the neighbourhood, site and building/project scales.
b. Identify a **target Terrestrial Natural Heritage System** and adopt policies to protect and regenerate a minimum of 13% of the land base as natural cover in the Don watershed.
c. Protect and enhance the quality and extent of public greenspaces and trails, connecting and protecting the **natural and cultural heritage** of the Don watershed.
d. Conduct **comprehensive flood risk assessment plans** where redevelopment or intensification is proposed in a flood vulnerable area and/or a Special Policy Area that would maintain or decrease the existing level of risk and detail flood remediation, flood proofing, flood warning, and emergency response measures.
e. Adopt the *Greater Golden Horseshoe Conservation Authorities'* ***Erosion & Sediment Control*** *Guideline for Urban Construction* and update municipal erosion and sediment control by-laws and fill by-laws as necessary.
f. Adopt policy to recognize and implement the Don River **Fisheries Management Plan**.
g. Support **updated and expanded monitoring programs**, including ambient monitoring, requirements for pre-development baseline monitoring, cumulative effects monitoring and the monitoring of new technologies to assess their contributions to watershed improvements.

2. MEI, MMAH, municipalities, TRCA, AMO, CO, BILD - Establish **development standards for sustainable community design** for application to new development proposals, urban expansions, redevelopment, and intensification. Consider incorporation of LEED for Neighbourhood and Zerofootprint principles (1-3).
3. TRCA, municipalities and other approval agencies - Develop strategies for **facilitating innovative design projects and approvals** (1-4).
4. Municipalities, TRCA, BILD – Promote a **sustainable redeveloping neighbourhood demonstration project and a sustainable greenfield neighbourhood demonstration** (1-5).
5. Municipalities, TRCA – Partner to **develop a generic Terms of Reference for redevelopment MESPs** (1-7).
6. Each ORM municipality - Recognize the *Don River Watershed Plan* in its official plan, as required by the ***Oak Ridges Moraine Conservation Plan***. (1-10)
7. TRCA, municipalities - Undertake a scoped **economic assessment** of the implications of implementing the watershed plan's integral recommendations, including: valuation of ecosystem services; preparation of a methodology for applying the net gain approach; and development of recommendations for applying fairness and equity in implementation (1-23).

Regeneration

1. TRCA, municipalities and landowners – Develop **sustainable neighbourhood retrofit action plans** using an integrated approach including residential social marketing, naturalization, urban forest enhancement, stormwater management, infiltration, energy and effectiveness monitoring (2-1).
2. Municipalities – Undertake end-of-pipe **stormwater retrofit projects** as opportunities arise, as identified in municipal stormwater retrofit plans (2-2).
3. Municipalities, TRCA, developers, landowners – Implement **stormwater source controls** (infiltration, evapotranspiration, re-use) as opportunities arise in new and re-development, intensification and infrastructure projects, especially in priority sub-basins (2-5).

4. Watershed residents, businesses, landowners – **Adopt lot level sustainable practices** to improve support water balance, natural heritage and resource use objectives (e.g., rain gardens, rain barrels, downspout disconnections, back/front yard naturalization (partial or complete), household water and energy conservation, waste reduction) (2-9).
5. Waterfront Toronto, TRCA, City of Toronto – Continue to implement the **Lower Don River West Remedial Flood Protection Project** and the **Don Mouth Naturalization and Port Lands Flood Protection Project** to address flood and erosion risk, stream form, naturalization and aquatic habitat objectives (2-11, 2-12, 2-22, 2-28).
6. Toronto, TRCA – Complete a **fluvial geomorphology study of Taylor/Massey Creek**, including: a complete geomorphic systems analysis of the creek; a risk assessment for all valley land infrastructure and a long term concept to remediate identified concerns (2-15).
7. Richmond Hill, TRCA – Develop hydrologic and hydraulic **modelling for the Enford Road area** to confirm flood risk and potential mitigation alternatives (2-16).
8. Municipalities, TRCA – **Remediate erosion in ravines** and priority erosion control sites (as identified in municipal and TRCA databases) where human health, property, or infrastructure is at risk (2-17).
9. Municipalities, TRCA, NGOs – Develop and implement **restoration implementation plans** for natural cover in the whitebelt (2-18) and for targeted lands in priority areas on the ORM/Greenbelt (2-19) and in existing urban areas (2-20, 2-21).
10. DFO, MNR, TRCA, municipalities, NGOs - Improve **native aquatic species diversity**, abundance and distribution, and protect and enhance habitat for Target Community Indicator Species as outlined in the *Don River Fisheries Management Plan* (2-29).
11. TRCA, municipalities, NGOs - Undertake detailed planning and develop a long term funding strategy to implement the Don Watershed **Inter-regional Trails network** (2-32) and identify a conceptual route for a Don River Learning Trail (2-33).
12. Establish a facility (GTA-wide) for **archaeological artifact storage** and document collections that is accessible to researchers (2-39).
13. Municipalities, TRCA – Pursue additional scoping and study, and implement the Maple Nature Reserve (Quonset Hut), Mud Creek Neighbourhood, and Warden Woods Residential Area **concept site plans** (2-40).
14. Businesses, TRCA, Municipalities, NGOs – Adopt the Partners in Project Green **Eco-Business Zone model** and strategic elements of the Industrial Retrofit concept site plan to engage watershed business communities in adopting sustainable practices. Start with building relationships in the Leaside Business Area (2-41).

Land Securement

1. TRCA, municipalities, NGOs, golf courses, private landowners – **Secure lands to establish the missing links in municipal trails.** Work with private landowners (e.g. golf courses, hydro corridors) to acquire easements for trail access where acquisition is not a suitable alternative (3-2, 3-7).
2. TRCA, Toronto, Waterfront Toronto – Seek opportunities to **secure additional public greenspace** through the remediation of brownfield sites, reestablishment of a naturalized mouth of the Don, and redevelopment of lands adjacent to the naturalized river mouth (3-9).
3. Municipalities, MOE, TRCA – Ensure that publicly-owned lands appropriate for inclusion into the greenspace system (e.g., regenerated landfill sites) remain as **public lands** and any ownership or access issues are resolved (3-10).

Stewardship and Education

1. TRCA, municipalities, Green Building Council, BILD and other partners - Deliver **technology transfer workshops, seminars and materials** for sustainable technologies and urban form, site restoration best management practices, and LEED-type certifications (4-1, 4-6, 4-11, 4-12).
2. Green Building Councils, TRCA, municipalities, BILD, NGOs, media - Continue to provide opportunities for the **public and media** to see and learn about sustainable home products and services (4-13).
3. TRCA, municipalities, NGOs – Develop a strategy for **co-ordination of outreach programs and a lot level marketing campaign** (with residential, business and institutional lands focus), as part of the sustainable neighbourhood retrofit action plans (4-16, see 2-1).
4. Municipalities, TRCA – Develop and implement **pilot outreach education programs for encroachment on valley lands** (residential and industrial) (4-19).
5. Municipalities, TRCA - Implement **demonstration projects** for stormwater management retrofit, naturalization and other sustainable practices with the business and institutional landowners (4-25).
6. TRCA, Municipalities, school boards, utilities, BILD, NGOs - Develop an outreach program based on the results from the **Renewable Energy Road Map** to promote the uptake of renewable energy technologies (4-36).
7. TRCA, School boards - Promote the **EcoSchools** program to all schools in the watershed (4-37).
8. Municipalities, TRCA - Promote existing **park stewardship programs** in parks near Urban Growth Centres. Enhance current programs with support for volunteer naturalization projects, invasive species removal, habitat creation work, and monitoring where suitable (4-47).
9. Develop a **communications plan** in partnership with Aboriginal groups and descendent populations (4-58).
10. TRCA – Incorporate **experiential learning** about past people's as a component to existing public events such as tree plantings, festivals and family nature events (4-61).

Operations and Maintenance

1. Municipalities, TRCA – Develop guidelines for design and establishment of municipal **stormwater facility maintenance programs**, including monitoring, rehabilitation and financing mechanisms, and conduct assessments of sediment accumulation in stormwater ponds and develop prioritized lists of clean-out projects (5-1, 5-2, 5-3)
2. TRCA, municipalities – Undertake a **flood risk reduction study** to improve the hydraulic capacity of road and rail crossings in flood vulnerable areas (5-14).
3. Toronto, TRCA - Prepare a **flood emergency response plan** for SPAs and flood vulnerable areas, including an inventory of hazards, prioritization, and emergency response protocols (5-16).
4. TRCA - **Track advances in prediction of regional and local climate change** and re-assess local flood risks and management measures (5-17).

Enforcement

1. Various agencies, municipalities - Develop **inter-jurisdictional compliance protocols** for erosion & sediment control, tree cutting, topsoil and land disturbance, dumping, trespassing, and encroachment. Identify gaps in regulatory capability and capacity. Identify options for addressing gaps. Develop resources and an implementation plan (6-5).

Monitoring

1. TRCA and partners - Identify technologies that show promise and monitor their performance using the **Sustainable Technologies Evaluation Program** (STEP) - i.e., rainwater collection and re-use, permeable pavement, infiltration chambers, engineered media to remove phosphorus, groundwater and soil contamination risk with infiltration technologies, chloride removal techniques, long term performance and maintenance costs of any green technology, and green energy systems (7-1, 7-2).
2. TRCA, municipalities, MEI, BILD - Convene discussions with MEI and determine mechanisms for requiring developers to **monitor sustainable technologies** and other innovative design features **in Urban Growth Centres** to ensure performance targets are met (7-4).
3. TRCA, municipalities - Launch **cumulative effects monitoring programs** for innovative development design (7-6).
4. TRCA - Review recommendations for additional monitoring in the Don watershed as part of the next review and update of the **Regional Watershed Monitoring Network** (7-9, 7-11, 7-12, 7-15, 7-19).
5. TRCA, municipalities - Develop and implement a program to **monitor the success of ecological regeneration projects** and effectiveness of invasive species control sites (7-27).

Tracking Progress

Progress towards the objectives set out in the watershed plan will be tracked by looking at watershed conditions compared with the target indicators identified in the plan. Changes and trends in the watershed conditions will be monitored under the Regional Watershed Monitoring Network and reported on a regular basis through publications such as the Don newsletter, TRCA website, Don Watershed Report Card and the TRCA Living City Report Card.

In keeping with the theme of taking advantage of every opportunity to make improvements, level of effort by watershed stakeholders will be another measure of success. The top priority projects in the *Implementation Guide* will be used as a guide to track progress on key actions. Regular input from municipal partners, the DWRC and other stakeholder groups will help to capture the full picture of on-going and emerging projects in the watershed that contribute to gains in environmental quality and community health.

Cooperation and sharing of resources and ideas will be essential to implementation of the watershed plan's recommendations. Recognizing that many issues raised in the Don Watershed Plan are applicable to all watersheds in the GTA and are of interest to multiple municipalities, TRCA proposes convening regular ad hoc meetings to build partnerships to address these common challenges.

Photo credit: Keri McMahon

Appendix 8: Don River Watershed Planning Study List of Supporting Documents

Watershed Plan

Toronto and Region Conservation Authority. 2009. *Don River Watershed Plan*.

Supporting Documents

Toronto and Region Conservation Authority. 2009. Don River Watershed Plan Reports on Current Conditions - Geology and Groundwater Resources; Fluvial Geomorphology; Aquatic System; Surface Water Hydrology/Hydraulics and Stormwater Management; Baseflow and Water Use; Surface Water Quality; Terrestrial Natural Heritage (and refinement of the Target System); Land and Resource Use; Nature-based Experiences; Cultural Heritage; and Air Quality.

Toronto and Region Conservation Authority. 2009. *Don River Watershed Plan Implementation Guide*.

Toronto and Region Conservation Authority. *Don River Watershed Based Fisheries Management Plan* (in progress, 2009)

The Municipal Infrastructure Group Ltd. 2009. *Don River Watershed Site Evaluation*. Prepared for Toronto and Region Conservation Authority.

XCG Consultants Limited. 2009. *Upper Don River Watershed Sustainable Stormwater Management Study*. Prepared for Toronto and Region Conservation Authority.

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Freeman Associates. 2006. *Action Plan for Sustainable Practices—Implementation Strategies for the Residential and Business Sectors in the Greater Toronto Area.*

J.D. Power and Associates. 2006. *2006 New Home Builder Customer Satisfaction Study – TRCA Supplemental Study*. Toronto and Region Conservation Authority.





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