4.0 TRCA HISTORY AND EVOLUTION TO THE LIVING CITY

4.1 HISTORIC OVERVIEW

In the early part of the 20th Century, naturalists, farmers, hunters and anglers formed grass roots organizations to lead the conservation movement. The movement brought attention to the poor land, water and forestry practices of the 1930s and '40s. When combined with the impacts of drought and deforestation, extensive soil loss and flooding occurred. The work of these groups and others like them set in motion the coordinated effort between citizens, academics, and the government that culminated in the formation of conservation authorities in 1946. When the *Conservation Authorities Act* was passed in the Ontario legislature, it enabled municipalities to apply for the establishment of conservation authorities in their areas. For the first time, a municipality that wished to manage their natural resources could do so without being hampered by their political boundaries. Granting this responsibility to conservation authorities was a clear indication that watershed boundaries were the ideal jurisdictional unit for managing the natural environment, and especially water.

As an amalgamation of four smaller conservation authorities, the Metropolitan Toronto and Region Conservation Authority (MTRCA) was established in response to a natural disaster that struck the Toronto region in October 1954. Hurricane Hazel delivered almost 300 millimetres of rain to Southern Ontario, with the majority falling within the last twelve hours of the storm. Flooding was inevitable: steep river slopes saturated by previous rainfall, funneled ninety per cent of the rain directly into rivers and streams. Flows in the Humber River were four times greater than previously recorded. Eighty-one people died and thousands of people were left homeless. Most of the bridges on the west side of Toronto were destroyed or badly damaged, as were many on the Don River. Several roads, parks, public utilities - even an entire street of houses - were washed out and destroyed.

A former (M)TRCA Chief Administrative Officer recounts the response to the disaster in his book, *Paths to The Living City*:

> The aftermath of Hurricane Hazel was an unprecedented effort of cooperative planning and regeneration for the Toronto area river valleys. All levels of government pitched in and for a period of almost 30 years, worked together and equitably shared the costs of the massive undertaking. Of all the plans and projects that have shaped the Toronto region, it is unlikely that any have been as far reaching and beneficial. It has meant, among other things, that one can stand alongside the Humber, a few yards north of the Bloor Street viaduct, surrounded by a network of more than 30,000 acres of green space, and gaze at a simple reminder of a long-ago tragedy, secure in the knowledge that a similar storm today would not carry with it the same devastation. The organization created to achieve these results was the MTRCA (McLean, 2004).

Since its precipitous beginning, the story of TRCA has been one of continuous evolution and adaptation in responding to changes in science, community demands, and public policy. In the early years of TRCA, Hurricane Hazel's influence focused efforts on flood control.

Structural Approach to Flood Control

The prevailing ideology coming through provincial direction was largely engineering-based. MTRCA's 1959 Plan for Flood Control and Water Conservation called for the construction of multi-purpose dams and reservoirs, engineered river channel improvements, the acquisition of flood plain lands, and the creation of a flood warning system. The flood warning and forecasting program was designed to monitor watershed conditions including snow, precipitation and flows, as well as to issue flood warning messages to municipalities when conditions warranted, (which still exists today). But as the costs of land acquisition and major engineering works escalated throughout the 1960s and 1970s, it became clear that these aspects of the approach were not financially viable and not always environmentally desirable.

Waterfront Plans and Integrated Shoreline Management

Also at this time, plans and jurisdictional roles were being discussed for managing the Lake Ontario shoreline, when the 1967 *Waterfront Plan for the Metropolitan Toronto Planning Area* was produced. The waterfront planning area was divided into a number of sectors, based on both physical criteria and recognition of jurisdictional areas. In 1970, the Province designated MTRCA as the lead implementing agency for the Etobicoke to Ajax-Pickering shoreline, except for the central downtown waterfront area. MTRCA fulfilled its shoreline mandate based on a new concept of "integrated shoreline management" to limit high rates of shoreline erosion while enabling safe public access and regional scale recreation opportunities. Two major legacies of this work are evident along the Lake Ontario shoreline and in the way TRCA conducts its business today: 1) the creation of a number of large, open space/parkland areas connected by a waterfront trail system, including several public marinas; and, 2) a planning process that is integrated with the municipal planning process to include a variety of opportunities for public participation in the planning for waterfront revitalization.

Ecological Approach to Watershed Management

MTRCA's 1980 Watershed Plan (and 1986 update) reflected the change in provincial policy direction promoted by the new Ontario Ministry of Natural Resources, by moving away from the structural engineering approach of the 1960s and 70s in favour of a more ecological approach to watershed management. Not just peak flood flows, but also water quality and healthy aquatic life took on new importance. MTRCA's 1989 Greenspace Strategy asserted that natural lands played a vital role in flood and *erosion* control, groundwater recharge and discharge, and in the health and well-being of urban dwellers. The Strategy went on to describe TRCA's ongoing work in land acquisition, archaeology, conservation education, land use planning, waterfront planning, recreation, and the importance of *headwaters* on the Oak Ridges Moraine. Further, the previous two decades' success in public acquisition of *flood plain* lands enabled staff to address impacts on the environment within valleylands and along the shoreline.

The 1982 *Environmentally Significant Areas* (ESAs) program began in the late 1970s focusing on major river valleys and the Lake Ontario waterfront. This resulted in the 1982 ESA study that identified 126 ESAs throughout the jurisdiction. In the early 1990s, the 1982 ESA study was updated by revisiting the ESA criteria and assessing tableland natural areas that had not been included in the original study. In 1994, to assess development proposed in or adjacent to valleylands, *watercourses*, and *ESAs*, the Valley and Stream Corridor Management Program (VSCMP) was published to serve as TRCA's planning and regulatory policies. Aspects of the

VSCMP, including the delineation of *ESAs* and *valley and stream corridors*, were subsequently incorporated into the official plan policies of many of TRCA's member municipalities.

Public Involvement in Watershed Management

The decade of the 1990s saw TRCA take its ecological approach to watershed management out to the community, evidenced in the creation of the Don Watershed Task Force. The task force was comprised of *watershed* residents, non-governmental organizations, municipalities, and other government agencies, with a mandate to develop an ecosystem regeneration plan for the entire Don River watershed. Its landmark strategy, *40 Steps to a New Don*, was completed in 1994. Watershed advisory council and general community participation on the Don, and in most other TRCA *watersheds*, take place to this day in projects such as river and shoreline clean-ups, tree plantings, *wetland* creation, and the development of trails and management plans. This community-based, ecologically-focused model was adopted by other community groups and repeated by TRCA in the development of *watershed* plans for the Humber and Rouge Rivers as well as the Duffins, Carruthers, Etobicoke and Mimico Creeks.

Scientific Advances in Watershed Management

While the community-based, participatory approach to *watershed* planning has been refined over the years, more recently, the most dramatic improvements in *watershed* planning have been to the science employed in assessing, monitoring, and predicting the health of *watershed* features and functions. The early days of hand calculations and paper-based mapping of *flood plains* were replaced with computerized GIS (geographic information systems) and digital models that simulate storm events of various magnitudes and frequencies to produce digital flood line maps. Since the late 1990s, real time, in-stream monitoring technology made for a more timely system of broadcasting flood warnings. These data, in conjunction with land cover and impervious surface data based on air photo or satellite imagery, have also been used to model the potential impacts of more severe and frequent storm events that may occur under various climate change scenarios.

New technology in *watershed* monitoring also helped to advance TRCA's stormwater management program, first initiated in 1980 in response to urbanization's effect on flooding and *erosion*. The multi-agency Stormwater Assessment Monitoring and Performance (SWAMP) Program operated from 1995 to 2003. The program was an initiative of the Government of Canada's Great Lakes Sustainability Fund, the Ontario Ministry of Environment and Energy, TRCA, and the Municipal Engineer's Association. A number of individual municipalities and other owner/operator agencies have also participated in SWAMP studies. The SWAMP Program's objectives were to: monitor and evaluate the effectiveness of new or innovative stormwater management (SWM) technologies and disseminate study results and recommendations.

The SWM program at TRCA evolved to include research in water quality and temperature impacts, source controls, and retrofitting facilities that do not meet current design standards. TRCA now leads a multi-agency initiative, the Sustainable Technologies Evaluation Program (STEP) to monitor and evaluate clean water, air, and energy technologies, such as *low impact development* (LID) measures for SWM. The program continues the work that the SWAMP program began but with a broader focus (see sidebar).

TRCA initiated STEP in 2005 to provide the data and analytical tools necessary to support broader implementation of sustainable technologies and practices within a Canadian context. STEP's main objectives are to:

- monitor and evaluate clean water, air and energy technologies;
- assess barriers and opportunities to implementing technologies;
- develop tools, guidelines and policies; and
- promote broader use of effective technologies through research, education and advocacy.

Technology has also been critical in mapping the extent of *natural cover* throughout TRCA *watersheds*. In 2001, with digital aerial photography, and field inventories using the provincial ecological land classification system, TRCA documented the losses of natural areas and local *biodiversity*. Through TRCA's Terrestrial Natural Heritage System Strategy (TNHSS) released in 2007, this information was used to develop computer models to show where and how much land needs to be restored to *natural cover* to stop *biodiversity* losses, and was also used in TRCA watershed plans to demonstrate that expanding natural cover improves *hydrology* (less flooding and *erosion*).

Provincial Sustainability Agenda to Create a "Culture of Conservation"

TRCA initiated The Living City® Strategic Plan in 1999 with the goal to engage agencies, industries and communities in collaborating for the sustainability of all life within TRCA's nine river watersheds and Lake Ontario waterfront. Creating a context for the advancement of TRCA's programs of The Living City in the last 15 years through to present day, has been provincial legislation such as the *Oak Ridges Moraine Conservation Act*, the *Greenbelt Act*, the *Clean Water Act, The Places to Grow Act* and the *Green Energy Act*. The Growth Plan for the Greater Golden Horseshoe, Provincial Policy Statement (PPS) 2014 and the *Green Energy Act* are intended to move society towards a "Culture of Conservation" that must adapt to climate change and promote renewable and alternative sources of energy, and apply a sustainability lens to growth management through *intensification*, public transit, water, energy, and cultural heritage conservation. In particular, the Province's Growth Plan is aligned with The Living City vision, in that it contains policies for natural heritage, agriculture, water, energy, air, waste management, and cultural heritage. Many of these themes are present in some of TRCA's most recent programs of The Living City (see sidebar).

Some TRCA Programs of The Living City:

- Encouraging the transformation to a "green" economy by developing partnerships and implementing programs for energy conservation, environmental education, and waste management, including the Mayor's Megawatt Challenge, Sustainable Schools, and Greening Retail and Health Care.
- Social equity projects to hire under-served youth to grow and sell food at community gardens on TRCA lands; and to hire or mentor new Canadians who are foreign-trained professionals, so they are able to gain "Canadian" experience and secure gainful employment in their chosen professions.
- Preserving and celebrating cultural heritage at TRCA's Black Creek Pioneer Village, through our ongoing Archaeological Heritage Resource Management Program for TRCA-owned lands; and providing educational recreation opportunities at TRCA's conservation areas, including The Living City Campus at Kortright Conservation Area.

Trends to the Future: Green Infrastructure, Ecosystem Services and Ecological Design

Just as the 1994 Valley and Stream Corridor Management Program (VSCMP) described valley and stream corridors as the foundation of the greenspace system, TRCA recognizes the *Natural System* as the natural *green infrastructure* of the Toronto region. Both natural and built *green infrastructure* can perform many of the functions of traditional "grey infrastructure" such as reducing flooding and *erosion* and filtering water and air pollutants, but also provides additional *ecosystem services* like moderating the *urban heat island effect*, and providing opportunities for recreation and community aesthetics. As well, *green infrastructure* is less costly then grey infrastructure, especially considering its longer life cycle.

Another one of the VSCMP's principles was that the successful management of *valley and stream corridors* is dependent on good tableland management. Today, The Living City Policies are premised on the scientifically-derived conclusion that the *ecosystem services* on which human health depend, can be produced from the entire landscape, and not just protected natural areas, especially considering their diminished and impaired state in heavily urbanized areas. Therefore, in addition to protecting and restoring the *Natural System*, TRCA promotes sustainable design of the lands to be developed or redeveloped. To this end, TRCA, with its partners, endeavours to undertake an ecological design approach to city-building, in which the urban and natural are integrated (while keeping the *Natural System* in tact) rather than being strictly segmented from each other.

Current trends in site *redevelopment* and urban design promote a standard that incorporates green infrastructure and technologies for water management and landscape restoration proposals. Over the last decade or so, design professions - architects, landscape architects, planners, engineers - have been advancing integrated site design into the best site planning and building practices. Not only does this design approach build more sustainable site plans for the future, but serves to reduce construction and maintenance costs compared to traditional forms of site development. Conceptual attention to green infrastructure and technologies also builds a more attractive landscape from an urban design perspective, and many projects are winning awards for their innovative results within the city-region.

Since the days of Hurricane Hazel, TRCA has a 60-year history of researching, regulating, advising, and collaborating with our partners to manage the health of our *watersheds* and waterfront for environmental and public benefit. TRCA is now experiencing the most significant turning point in the history of the organization. We are building on our expertise in *watershed* management and land conservation, and moving beyond those traditional mandates, to achieve a broad, ambitious, positive vision for the Toronto region in the coming decades. TRCA is

working to incorporate sustainability elements into all aspects of its traditional mandate (environment) as well as its own operational programs and practices, to address the social, economic and cultural heritage components of sustainability.

In collaboration with its partners, TRCA will continue to respond to changes in environmental conditions and public policy in carrying out the proper management of our *watersheds* and waterfront, necessary for sustaining the health of our city-region in the years to come.