

2.0 THE TORONTO REGION

2.1 TRCA'S JURISDICTION

Under the *Conservation Authorities Act*, TRCA has regulatory jurisdiction over nine watersheds and a portion of the Lake Ontario shoreline. Containing all or parts of eighteen different municipalities, it is one of the largest of the 36 conservation authorities in Ontario and is certainly among the most urbanized with the highest population and population density. Draining from the Oak Ridges Moraine, Peel Plains, South Slope, and Iroquois Sand Plain, TRCA's watersheds are:

- Etobicoke Creek
- Mimico Creek
- Humber River
- Don River
- Highland Creek
- Rouge River
- Petticoat Creek
- Duffins Creek
- Carruthers Creek

The jurisdiction also includes small areas that drain directly to Lake Ontario, such as Frenchman's Bay. The Lake Ontario shoreline portion of TRCA's jurisdiction spans approximately 60 kilometres from Marie Curtis Park in the west, to the Ajax waterfront in the east, and extends into Lake Ontario to a point defined by the *Territorial Division Act*. However, it excludes some of the central waterfront that is under the jurisdiction of the Toronto Port Authority.

Figure 2.1 illustrates TRCA's jurisdiction within Southern Ontario and indicates the municipalities located either wholly or partly within the jurisdiction, which are also listed below.

- Township of Adjala-Tosorontio
- Town of Mono
- Regional Municipality of Peel
- Town of Caledon
- City of Brampton
- City of Mississauga
- City of Toronto
- Regional Municipality of York
- Town of Aurora
- Township of King
- City of Vaughan
- Town of Richmond Hill
- City of Markham
- Town of Whitchurch-Stouffville
- Regional Municipality of Durham
- Township of Uxbridge
- City of Pickering
- Town of Ajax

2.2 TRCA'S WATERSHEDS AT A GLANCE

TRCA's jurisdiction is as diverse as it is large. Landscapes and land uses vary widely across our *watersheds*, from the *headwaters* to the Lake Ontario shoreline. Although the Toronto region takes in the most urbanized core of the City of Toronto and the surrounding suburbs of the three regional municipalities, just less than half of the jurisdiction remains rural and agricultural. The jurisdiction lies in an ecological zone of transition straddling two forest regions: the Great Lakes-St. Lawrence forest in the north, and the Carolinian forest in the south. Natural cover is mainly deciduous and mixed forest, interspersed with smaller tracts of wetland, native meadow, and Great Lakes coastal habitats.

Prior to European settlement and clearing for agriculture, it is estimated that forest covered approximately 90 per cent of southern Ontario, including TRCA *watersheds*. Today, natural spaces in the TRCA jurisdiction are largely confined to the deeply-incised valley systems of the urban landscape and the rural and agricultural landscapes of the northern portions of the watersheds. In comparison to downstream reaches that are predominantly urban and urbanizing, the natural landscape of TRCA's rural areas is generally characterized by headwater streams, wider, shallower valley corridors, and more *wetlands*. The *natural cover* that is found in the rural areas is especially important to protect for the long term, given that the highest *groundwater recharge* rates and *headwaters*, vital to downstream reaches, are found here. Other than the Oak Ridges Moraine and a small portion of the Niagara Escarpment, remnant natural habitats and landforms that help shape the character of TRCA's jurisdiction include:

- The nine rivers and their tributaries, much of whose valleylands function as vital green corridors within the urbanized area, including the Humber River which is a designated Canadian Heritage River;
- Rouge Park, the second largest urban natural heritage park in North America, and now a National Park;
- The shoreline of post-glacial Lake Iroquois, a major rise in elevation that extends from west to east across the region, inland from Lake Ontario. The Lake Iroquois Shoreline delineates the shoreline of ancestral Lake Ontario formed approximately 12,500 years ago when lake levels were up to 60 metres higher than the present lake level. In many areas, urban development occupies both above and below the Shoreline feature. Yet, in its eastern reaches, due to its often sandy nature, significant height and steep slopes, the actual narrow linear feature has not been extensively developed;
- The Scarborough Bluffs, Toronto Islands, the mouth of the Don River (where major flood *remediation* and *restoration* of the natural mouth of the River is taking place); and other Lake Ontario beaches and bluffs, and coastal marshes in the Duffins, Carruthers and Humber watersheds;
- Forests and *wetlands* in the provincially designated Greenbelt lands that are adequate to support flora and fauna species and communities characteristic of the region before European settlement, some of which are now rare or endangered;
- Tallgrass prairie and oak savannah communities, now rare in North America, such as those in High Park in the City of Toronto;
- The *urban forest*, or urban canopy, consisting of valleyland and tableland trees, street, park, and yard trees all in an urban setting, which make an important contribution to the beauty and *ecological function* of the urban landscape; the older ravine system, under pressure from increasing population due to *intensification* targets, is bolstered by this *green infrastructure*.

Moreover, there is diversity across TRCA's jurisdiction in terms of geophysical, land use, and policy characteristics, such as:

- Headwater areas, subject to provincial land use plans such as the Greenbelt, Oak Ridges Moraine, and Niagara Escarpment plans (see Figure 2.1) which contain pockets of urbanized areas, but are mainly natural and rural or agricultural, with that character protected in varying degrees by corresponding provincial legislation;
- Agricultural and rural areas south of the Moraine and Greenbelt, and outside of lands currently designated for urban development—the so-called “whitebelt” lands from the provincial Growth Plan for the Greater Golden Horseshoe;

- Urbanizing areas, consisting of lands that are within designated urban or settlement areas, which are currently being developed or are committed to development; and finally,
- Built-out areas including the City of Toronto and the southern portions of the surrounding regional municipalities of York, Peel and Durham, which are subject to the Growth Plan and will experience major *redevelopment* and *intensification* in the coming decades.

As one of the most rapidly growing and ethnically diverse city-regions in North America, TRCA's jurisdiction was home to some 3.4 million people in 2011 (Conservation Ontario, 2012), compared to approximately 1.2 million in 1951. The impacts of the urbanization taking place to accommodate this growth are evidenced in historical Ontario Ministry of Natural Resources records, settler reports, and other sources, which show that over 120 species, including elk, bobcat, atlantic salmon, yellow bullhead, wood turtle, calypso orchid, and indian paintbrush, are no longer found in the region. This happened primarily through the direct loss of natural cover, due first to the conversion of forest lands to agricultural uses and later to urbanization. The remaining *natural cover* was affected through changes in water quantity and quality, soil compaction, invasive plants, and recreational use.

2.3 ISSUES, CHALLENGES AND OPPORTUNITIES

Although greenfield portions of TRCA's watersheds are still undergoing development a prevalent trend in land use change affecting the jurisdiction is redevelopment and intensification of existing urban areas. This brings challenges such as constructing housing and upgrading transportation and servicing *infrastructure* for an additional two or so million people over the next 20 years. Key among these challenges from TRCA's perspective and mandate are:

- growth and urban *intensification* in the context of natural heritage protection and managing the risk from *natural hazards*; and,
- adapting to and mitigating for the potential impacts of climate change.

Recent provincial legislation has established a regional framework for growth management based on increased urban *intensification* and ultimately fixed future urban growth boundaries. These "Growth Plan" lands are framed by the agricultural lands and natural areas protected by the Greenbelt Plan 2005, which encompass the *headwater areas* in TRCA's jurisdiction. While TRCA is supportive of this regional planning framework, the challenges resulting are two-fold:

- 1) to ensure that the provincial-scale natural areas protected in the rural lands of the Greenbelt are connected through the urban landscape to the Lake Ontario shoreline by a locally protected, viable and enhanced *Natural System*; and
- 2) to ensure that the increased impervious surfaces resulting from urban *intensification* and the development of new greenfield lands do not result in increased *flooding* and *erosion hazards* to upstream and downstream communities and *infrastructure*.

TRCA's *Natural System* is comprised of water resources, natural features and areas, *natural hazards*, and restoration areas of *potential natural cover* and *buffers*.
(Policy 7.3.1 a))

The *Natural System* is a fundamental component of a complete community and to achieving a high quality of life. The *ecosystem services* offered by nature are needed particularly in urban and urbanizing areas where, ironically, natural areas are under the greatest pressure. A robust *Natural System* is better able to perform *ecosystem services* but population growth puts additional stresses on the System. In urbanizing city-regions like the Toronto region, a more robust *Natural System* will be that much more valuable in the future.

Natural processes that help “sustain and fulfill human life” are considered *ecosystem services*. Natural systems perform *ecosystem services* on which humans depend and that are economically and ecologically impossible to duplicate. There are many *ecosystem services* that a healthy Natural System can provide. They include:

- Regulating the hydrologic cycle by capturing, storing and cleaning the water we drink and swim in;
- Reducing peak flows and flooding from storm events;
- Promoting healthy fish and aquatic communities;
- Contributing to cleansing pollutants from the air we breathe, producing oxygen;
- Regulating climate; providing shade;
- Providing active and passive recreational opportunities
- Promoting a sense of place from identifying with the unique character that natural areas bring to a city; and
- Promoting healthier lifestyles resulting from clean air and water and access to open spaces with natural aesthetics.

The need for a *Natural System* originated in 1999 from observations by TRCA and others that showed an alarming reduction in vegetation communities and species populations, and their distribution within TRCA’s jurisdiction. This change was occurring simultaneously with urban expansion despite the best efforts of the time for protection. According to the Great Lakes Remedial Action Plan, the recommended amount of natural cover needed for reasonably healthy and resilient ecosystems is 30 per cent forest cover and 10 per cent wetland. *Natural cover* in TRCA’s jurisdiction has been measured at approximately 15 per cent in forests and 1 per cent in wetlands. A reduction in forests, wetlands, meadows and their species is also accompanied by increases in flooding and erosion, and in conflicting recreational uses in protected areas. Changes in land use are often approved site-by-site without understanding how, cumulatively, they affect the region’s *Natural System* and environmental health. An important premise of a systems approach is that the distribution and quantity of *natural cover* and species is intricately linked to water, air quality and climate regulation, quality of life, and sustainability for citizens of the Toronto Region.

In addition to dealing with the impacts of urbanization, we must strive to account and plan for the uncertainties of climate change. Climate change modeling predictions show a number of possible scenarios ranging from increased periods of drought; to more frequent and severe rain storm events; to seasonal timing changes such as more rain events in winter, rather than snow. This would result in greater surface runoff and potentially increased flooding and erosion risks. In addition to increasing flood risk, the potential effects of climate change also include a rise in the influx of invasive species, the loss of traditional vegetation and wildlife species and communities, and public health challenges from poorer air and water quality and new vector-borne diseases.

The provincial Places to Grow Growth Plan for the Greater Golden Horseshoe, 2006 directs municipalities to address the impacts of urbanization by developing a “culture of conservation.” Therefore, the issue is not just where to grow (environmental protection) but how to grow (environmental management). This issue could be viewed as an opportunity to develop and redevelop new sustainable communities. As urbanization moves to the upper extents of TRCA’s watersheds, sensitive headwater areas will be affected. It is especially these areas that require attention to natural heritage protection and enhancement along with innovative technologies for water management that will maintain the function of headwaters critical to the health of downstream reaches.

Sustainable development requires capitalizing on the linkages between humans and the environment – striving to balance economic, social, cultural, and environmental values. In this sense, TRCA's integrated approach to *watershed* management serves TRCA and its partners well. As described in the history and evolution to The Living City in Section 4.0, TRCA has been studying its changing *watersheds* for almost 60 years. Our understanding of the impacts of urbanization and the effectiveness of mitigation measures are constantly evolving. This scientific expertise is fully integrated with our planning and regulatory review functions. Known as Integrated Watershed Management (IWM), this holistic approach recognizes and operates based on the inter-connectedness of ecology, economy, and society – in short, a sustainability-based model.

IWM is an evolving, continuous and adaptive process through which decisions are made for the sustainable use, development, *restoration*, and protection of ecosystem features, functions, and linkages. TRCA's employment of IWM recognizes that paths to achieving The Living City are not only those of TRCA's core mandate of water, natural hazard, and natural heritage management, but also of other urban growth, natural resource, and quality of life pursuits such as cultural heritage, active transportation, community-based agriculture, and greening neighbourhoods. The integration of these paths can represent a "solution multiplier", whereby one feature strengthens the effectiveness of another. For example, higher density development is more supportive of public transit and active transportation, and this in turn helps to conserve green space and reduce auto-related environmental and human health impacts. TRCA's long practice in IWM, allows for addressing such wide ranging issues and objectives, and enables us to find synergies and plan effectively within a complex environment and uncertain future. With this in mind, TRCA will work towards supporting our municipal partners to conform to the provincial Growth Plan by creating a "culture of conservation," seizing the opportunity to help plan and build sustainable communities within TRCA watersheds.