

### 3. Land Securement

In general terms, land securement refers to the act of bringing lands into public ownership or otherwise securing the assurance of their protection through private landowner agreements. Land securement tools include: planning/policy (e.g. *Planning Act*, *Conservation Authorities Act*), stewardship (e.g. landowner agreements and education); and acquisition (i.e. securing land through title, easements and covenants on title).

The HWP recommends increasing natural cover from 32% to 39% of the watershed through implementation of the target terrestrial natural heritage system, as shown in **Figures 1.1 and 2.1**. The following priorities should be used to guide securement activities within the target terrestrial natural heritage system:

1. Locations in potential urban growth areas.
2. Locations in the Protected Countryside Areas of the *Greenbelt Plan* and *ORMCP* and Rural Areas of the *Niagara Escarpment Plan*.
3. Natural Core and Natural Linkage Areas designated in the *ORMCP*.
4. Areas of redevelopment in existing urban areas.

There are a number of groups active in land securement activities in the Humber watershed and there are further opportunities for partnerships among these groups. The securement groups should review their programs and consider ways to secure the 1.2% (446 ha) of the targeted terrestrial natural heritage system in the watershed that is currently not protected by policy mechanisms, within the next five years.

The HWP also recommends securement of lands, especially during redevelopment activities, to allow streams to evolve naturally. This will reduce the need for engineered methods to protect property and infrastructure from erosion and flooding. It also recommends lands be secured to enable expansion of the system of inter-regional trails, to create a northern gateway to the greenspace system of the Humber watershed via a proposed “Carrying Place Trail”, and to create additional public greenspace around growing communities.

See **Table 3.1** for a work plan of securement projects.

**Table 3.1 Land Securement Projects**

Theme	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Securement of Terrestrial Natural Heritage</b>	Secure the targeted system Rec. 60, 62 Investigate and conserve cultural heritage prior to land use change Rec. 73	Humber watershed securement initiatives of TRCA, municipalities, Nature Conservancy, ORM Land Trust, ORM Foundation, Ontario Heritage Trust	<p><b>3-1* TRCA</b> – Update the priority list for securement within the Humber watershed based on the HWP’s recommended priorities within the TNHS (see above list).</p> <p><b>3-2* Municipalities, TRCA</b> - Work with MPIR to investigate mechanisms, as may be necessary beyond planning measures, to secure the target TNHS lands in potential urban growth areas (aka, “whitebelt”) that do not have legislated protection from urban development (estimated to be 446 ha).</p> <p>3-3 <b>Ontario Heritage Trust</b> - Consider securement of properties with cultural heritage value and those within high priority areas of the target terrestrial natural heritage system, through their Natural Spaces Land Acquisition and Stewardship Program.</p>	✓	✓
<b>Securement of Public Greenspace</b>	Recognize and enhance the regional system for nature-based recreation Rec. 89, 90 Complete the inter-regional trail network Rec. 92-95 Establish public access to a northern gateway to the Humber greenspace system Rec. 101-102	Humber watershed securement initiatives of TRCA, municipalities, Nature Conservancy, ORM Land Trust, ORM Foundation, Ontario Heritage Trust	<p><b>3-4* TRCA</b> - Update the priority list for securement within the Humber watershed based on the HWP’s recommended priorities for expanding the system of inter-regional trails and creating new public greenspace.</p> <p><b>3-5* TRCA</b>, municipalities, NGOs – Secure lands to establish the missing link in the Humber Trail between Steeles Ave. and Hwy. 7 along the Main Humber</p> <p><b>3-6* TRCA</b>, municipalities, NGOs – Undertake a land securement strategy for the proposed East Humber Trail.</p> <p><b>3-7* TRCA</b>, Municipalities, NGOs – Undertake a study to: confirm the location of the historic Carrying Place trail; identify a conceptual route for the proposed contemporary Carrying Place Trail that connects the proposed East Humber Trail to a proposed northern gateway to the Humber greenspace system near Hackett Lake; and develop a strategy for the associated land securement and trail implementation.</p>	✓	✓

**Note: 1-1\* = top priority projects**

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Theme	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Securement of Stream Corridors</b>	Protect stream form Rec. 34	Secondary plans and plans of subdivision for redevelopment	3-8 <b>Municipalities, TRCA</b> - Seek opportunities to acquire lands in strategic locations to allow stream corridors to evolve naturally, without impacting property or infrastructure.	✓	✓

## 4. Stewardship and Education

A recurring theme in this plan is the need for initiatives to increase awareness and provide more information about ways that individuals, businesses and governments can contribute to a healthy, sustainable Humber watershed. The overall theme for stewardship and education programs is to encourage behavioural shifts to sustainable practices. This can include:

- ▶ energy conservation, water conservation and waste reduction
- ▶ organic lawn care
- ▶ landscaping with drought tolerant, native trees, shrubs & wildflowers
- ▶ lot level stormwater management (e.g. rain gardens, rain barrels, permeable pavements)
- ▶ pollution prevention
- ▶ spills prevention and management
- ▶ avoidance of practices that aggravate flood risk
- ▶ control of invasive alien species
- ▶ production and purchase of locally grown food
- ▶ stewardship of natural areas (including garbage clean up, community monitoring, bird boxes, tree tending, and addressing encroachment issues)
- ▶ awareness of cultural heritage (e.g. inter-relationships between the natural environment and past peoples' activities).
- ▶ erosion and sediment control and site restoration practices for construction sites
- ▶ integrated pest management for golf courses
- ▶ best management practices for farms and rural properties.

The Watershed Plan also highlighted the urgency of this shift to sustainable behaviour, not just to reduce our present impact on the watershed, but to create an accepting market for innovative community designs which will be the basis of long term growth planning and decision-making in the next five to ten years. These decisions will determine the watershed's long term health.

The *Action Plan for Sustainable Practices – for Residential and Business Sectors in the GTA (Freeman, 2006)* recommends a multi-pronged marketing campaign aimed at homeowners and builders in the GTA. For businesses, a package of measures is proposed, including stream-lined approvals, regulatory changes, financial incentives, information tools, awards and a corporate leaders program.

**Table 4.1** lists stewardship and education projects and is divided into seven sections:

1. Technical knowledge transfer
2. Sustainable urban landscapes
3. Rural lands
4. Resource use
5. Heritage interpretation
6. Formal education
7. Recognition

**Table 4.1 Stewardship and Education Projects**

**Note: 1-1\* = top priority projects**

Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>4.1. Technical knowledge transfer: training workshops, seminars and materials</b>						
<b>Sustainable Technologies</b>	Developers, consultants and builders	Implement sustainable urban form Rec. 120	Sustainable Technologies Evaluation Program (STEP) includes workshops and materials to disseminate information; led by TRCA; jurisdiction wide.	<b>4-1* TRCA</b> - Consider Watershed Plan priorities in preparation of annual training work plans. Deliver in partnership with academia, business, media, trade fairs.	✓	✓
<b>Erosion and Sediment Control</b>	Municipal and CA staff, consultants and contractors	Improve erosion and sediment control and site restoration Rec. 17	TRCA delivers annual technical workshops in different locations throughout the jurisdiction. e.g. As part of STEP, TRCA hosted a technical workshop on erosion and sediment control in March 2007.	<b>4-2* TRCA</b> , municipalities - Continue and expand existing training program on erosion and sediment control for urban construction.	✓	✓
<b>Site Restoration and Planting</b>	Municipal and CA staff, consultants and contractors, horticultural industry	Restore and enhance natural cover Rec. 65 Manage the matrix Rec. 69, 71, 72	TRCA maintains information about local suppliers of native plants (within 50 miles) TRCA's Nursery and Indigenous Plant Propagation Program supplies native trees, shrubs and aquatic vegetation to support Authority regeneration activities across the watersheds. TRCA's Valley & Stream Regeneration Program provides technical planning/design and regeneration implementation services through ongoing funding partnerships with member municipalities. Eligible projects include (but not limited to): <ul style="list-style-type: none"> <li>▶ tree and shrub planting for naturalization,</li> <li>▶ erosion and sediment control,</li> <li>▶ wetland habitat creation, and</li> <li>▶ trails.</li> </ul>	4-3 <b>TRCA</b> - Maintain current nursery propagation and production of native plants from locally collected seed sources to facilitate TRCA and other partner regeneration/planting initiatives throughout TRCA's jurisdiction. 4-4 <b>TRCA</b> - Maintain and publish an inventory of native plant suppliers. 4-5 <b>NGOs, TRCA</b> , - Outreach to encourage local growers and retailers to grow and stock more native plants.	✓	✓
<b>Invasive Alien Species</b>	Canadian Food Inspection Agency, MNR, TRCA,	Manage the matrix Rec. 71	CFIA has established a regulated area in parts of Toronto and Vaughan in the Humber watershed to prevent the spread of the Asian	4-6 <b>TRCA</b> , municipalities - Convene a forum for information sharing on invasive species management techniques and upcoming threats.	✓	

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<b>Invasive Alien Species</b> (continued)	municipalities, garden and angling supply retailers, gardeners, anglers		Long-Horned Beetle. TRCA Stewardship staff provides hands on training and work days for volunteers interested in assisting with invasive species removal on public lands and is preparing an invasive species fact sheet targeted at homeowners City of Toronto Urban Forestry group has undertaken invasive alien species control projects (e.g. dog-strangling vine in South Humber Park and Lambton Park)	<b>4-7 CFIA, MNR, TRCA</b> - Provide educational materials about invasive alien species for distribution at gardening and angling supply retailers.	✓	
<b>Sustainable Urban Form</b>	Developers, consultants, builders	Implement sustainable urban form Rec. 118, 119, 120		<b>4-8* Green Building Councils, TRCA,</b> municipalities, BILD, Canadian Urban Institute, NGOs, media - Conduct seminars on green building and certification programs (e.g. LEED - Leadership in Energy and Environmental Design) for developers, builders and consultants	✓	
<b>Sustainable Purchasing</b>	Home buyers and media	Implement sustainable urban form Rec. 118, 119, 120		<b>4-9* Green Building Councils, TRCA,</b> municipalities, BILD, NGOs, media - Conduct seminars on green building and certification programs for the public and media	✓	
<b>Spills Prevention</b>	Municipal staff	Prevent pollution Rec. 29	Municipal Emergency Management Plans may incorporate spill management plans	<b>4-10 Municipalities</b> - Develop a public education strategy for spills prevention coupled with targeted outreach with industrial sectors (trucking, waste disposal, construction)	✓	✓
<b>4.2. Sustainable urban landscapes</b>						
<b>Healthy Yards</b>	Homeowners and renters, garden contractors	Improve sustainability of development design Rec. 12 Implement stormwater retrofits Rec. 22-24 Prevent pollution Rec. 29 Manage flood risks Rec.	TRCA's Healthy Yards Program includes a website, publications, garden makeover contests, information about local suppliers of native plants (within 50 miles), and workshops, available to all communities in the jurisdiction. Adapted from TRCA's program, Richmond Hill's Healthy Yards program offers subsidized native plan and organic lawn care kits to its residents.	<b>4-11</b> Various partners - Continue existing programs <b>4-12* TRCA,</b> 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 sustainable neighbourhood retrofit projects (see Section 2 Regeneration). Consider feasibility of expanding GTA wide.	✓	✓

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<b>Healthy Yards</b> <i>(continued)</i>		30 Manage the matrix Rec. 69-72	Toronto's Urban Forestry Program and Wet Weather Flow Stewardship and Outreach Program funds community projects including naturalization, stewardship, and public outreach.  Local Enhancement and Appreciation of Forests (LEAF) initiative offers native trees and shrubs for backyard plantings in the City of Toronto.  Peel Green Home and Garden Expo provides information on how to become more efficient inside and outside your home by highlighting energy and water efficient products and practices, renewable energy, organic gardening products, etc.	4-13 <b>TRCA</b> - Continue to deliver and evolve the TRCA Healthy Yards Program based upon participant feedback forms and community-based social marketing research.  <b>4-14* TRCA</b> , municipalities – Promote rain gardens and produce related resources and garden transformation stories on Healthy Yards web sites	✓	
			Peel Region offers Water-wise Gardening Workshops promoting landscaping with drought-tolerant native plants, effective watering practices, composting and pesticide awareness.  York Region offers free water efficient landscaping audits and opportunities to learn about water wise gardening techniques through demonstrations at participating garden centres and conservation areas.	4-15 <b>TRCA, municipalities</b> - Host Organic Lawn Care workshops targeted at lawn care providers.	✓	
<b>Public Greenspace</b>	Homeowners, NGOs	Manage the matrix Rec. 69-72  Protect unique experiences of the greenspace system Rec. 103	TRCA has produced a fact sheet titled Natural Neighbours promoting good stewardship practices that is available for distribution to property owners adjacent to open space and natural areas.  Town of Richmond Hill provides homeowners	4-16 <b>Municipalities</b> – Distribute educational materials discouraging inappropriate uses of public greenspace (i.e. encroachments) and promoting good stewardship practices and distribute to property owners adjacent to open space and natural areas.	✓	

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Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Public Greenspace</b> (continued)			with information and guidelines regarding inappropriate uses of public greenspace (i.e. encroachments) and good stewardship practices. Claireville Community Stewardship Project Centreville Creek Community Outreach and Environmental Stewardship Program Black Creek Project Humber Valley Heritage Trail Association TRCA's Multicultural Environmental Stewardship Program provides: - materials in multiple languages - displays at cultural events - subsidized New Canadian visits to Conservation Areas - research, reports and shared information regarding various religious practices including river offerings and their impact on natural systems.	<b>4-17 TRCA</b> - Continue existing stewardship groups and projects for public greenspace areas and trails and establish new ones (e.g. Oak Ridges Corridor Park).	✓	✓
<b>Invasive Alien Species</b>	Homeowners, volunteer groups, garden supply retailers, nurseries	Manage the matrix Rec. 71	City of Toronto Urban Forestry group has undertaken projects to control alien invasive species (e.g. dog-strangling vine in South Humber Park and Lambton Park)	<b>4-18* TRCA, municipalities, NGOs, CFIA</b> - Co-ordinate the development of educational materials on invasive species removal techniques and engage volunteer groups to help in monitoring and removal.	✓	

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Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Invasive Alien Species</b> (continued)				<p>4-19 <b>Municipalities, TRCA, Landowners</b>, Volunteers, NGOs - Remove invasive alien species of plants to improve habitat for native species:</p> <ul style="list-style-type: none"> <li>▶ TRCA: Ebenezer Tract in Claireville Conservation Area</li> <li>▶ Toronto: Lambton Park, South Humber Park, Lambton Woods, Chapman Valley Park, east bank of main channel of the Humber north of Eglinton Ave., Rowntree Mills Park, St. George's Golf and Country Club, valleylands around Humber Arboretum, Keele Dale Park and Black Creek Parklands.</li> </ul>	✓	
<b>Pollution Prevention</b>	Youth and adult groups, general public	Prevent pollution Rec. 29	TRCA Yellow Fish Road Storm Drain Marking Program teaches people that whatever goes down the street sewer ends up in rivers and lakes. Yellow fish symbol is applied beside the storm drain, door hanger literature distributed to the surrounding homes.	4-20 <b>TRCA, municipalities, school boards</b> - Continue existing program	✓	
<b>Environmental Stewardship for Businesses and Institutions</b>	Businesses & institutions	Improve sustainability of development design. Rec. 5, 11, 12 Implement sustainable urban Rec. 118-119	MOE has a Source Water Protection education and outreach program that is being implemented by TRCA staff to those property owners within 100 metres of a municipal well. The program offers a 100% grant for any small businesses within 100 m that would like a Pollution Prevention Review.  TRCA is initiating an eco-industrial park project (Project Green) in partnership with the Greater Toronto Airport Authority in the Etobicoke and Mimico Creek watersheds  OCETA – TRCA partnership for pollution prevention and energy conservation projects	<p>4-21* <b>Municipalities, TRCA</b> - Implement demonstration projects for SWM retrofit, naturalization and other sustainable practices with the business and institutional landowners (See also sustainable neighbourhood retrofit project in Section 2 and healthy yards outreach programs and marketing campaign above).</p>	✓	

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Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>4.3. Rural lands</b>						
<b>Water Quality and Terrestrial Habitat</b>	Rural land-owners	Prevent pollution Rec. 28, 29 Restore and enhance natural cover Rec. 68 Provide services for local farm businesses Rec. 125-129	TRCA's Rural Water Quality Program and the seamless Peel Rural Water Quality Program delivered with CVC receives GLSF funding to work with farmers across the jurisdiction to provide financial and technical assistance to encourage and promote beneficial management practices on farms, including but not limited to fencing cattle out of streams and proper manure storage.	Partners: <b>TRCA, York Region, Peel Region, City of Toronto</b> , MNR, Great Lakes Sustainability Fund, Oak Ridges Moraine Foundation, Friends of the Greenbelt		
			Caring for the Moraine Landowner Contact Program implemented by TRCA with funding from ORMF: provides non-farm rural landowners with technical and financial assistance to implement woodlot, wetland and riparian projects on their private property. Priority areas include portions of Main Humber subwatershed.	4-22 <b>TRCA</b> , municipalities – Continue to host workshops and deliver presentations for farm and non-farm rural audiences that provide hands on training, information and technical assistance.	✓	✓
			Managed Forest Tax Incentive Program, operated by the Ontario Ministry of Natural Resources for properties > 10 acres	4-23 <b>TRCA</b> , MOE, municipalities – Continue to implement the Source Protection Program on behalf of the MOE to disperse information and funding to property owners within 100m of a municipal well.	✓	✓
			Rural Tree and Shrub Program operated by TRCA for rural landowners for properties > 2 acres	4-24 <b>TRCA</b> , municipalities – Continue to deliver the Rural Clean Water Program with a seamless delivery in York Region with LSRCA	✓	✓
			York Natural Planting Partnership for Private Landowners provides site visitation and technical advisory services to assist landowners in achieving environmental objectives through plant material supply and installation. Program is open to qualifying private landowners within the Region of York/TRCA jurisdiction. Projects are accepted and ranked for funding support subject to established criteria.	4-25 <b>TRCA</b> , municipalities – Develop and implement an Equestrian Stewardship Program in King Township	✓	✓

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Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Environmental Farm Plans</b>	Farmers (landowners and tenants)	Prevent pollution Rec. 28, 29 Manage the matrix Rec. 68 Provide services for local farm businesses Rec. 125-129	TRCA Rural Water Quality Stewardship Program (see above) staff also visit TRCA owned agricultural lands, interview tenant farmers and prepare an Environmental Farm Plan (EFP) for each property. Healthy Futures for Ontario Program (OMAF)	<b>4-26 Ontario Ministry of Agriculture and Food, Ontario Soil and Crop Improvement Association, TRCA</b> - Continue existing programs, giving priority to farms on the clay soils of the South Slope and Peel Plain physiographic regions.	✓	
<b>Agricultural Sustainability</b>	Farmers (landowners and tenants), municipalities, TRCA	Provide services for local farm businesses Rec. 125-129	GTA <i>Agricultural Action Plan</i> implementation programs.	<b>4-27 GTA Agricultural Action Plan Implementation Committee</b> , NGOs (e.g. Friends of the Greenbelt Foundation), TRCA – Develop work plans to co-ordinate action on those GTA Agricultural Action Plan recommendations noted as having particular relevance in the Humber watershed.  See also Section 5 Operations and Maintenance for publicly owned agricultural lands.	✓	
<b>Local Food First</b>	Institutions, restaurants, businesses, news media and general public	Support local food and awareness of sustainable agriculture Rec. 130-134	Farmers' markets and food/tourism festivals Programs to increase public awareness of local, sustainable agriculture e.g. Foodland Ontario. City of Toronto Urban Farm at Jane St. and Steeles Ave. FarmStart Project at Claireville Conservation Area to help train new farmers. TRCA is introducing an urban agriculture program at the Living City Campus at Living City Campus at Kortright to raise public awareness of the benefits of local foods.	<b>4-28 TRCA</b> - Acquire and provide collective access to agricultural equipment as shared resources and commit to supporting young farmers and New Canadians entering the agricultural industry.  <b>4-29 TRCA</b> - Assess the total area of TRCA owned lands available for agricultural production and commit to preserving it.  Partners: Municipalities, regional Federations of Agriculture, restaurant associations, TRCA, NGOs (e.g. Friends of the Greenbelt Foundation), GTA Agricultural Action Ctte.  4-30 - Support local food festivals through partnerships, e.g. Conservation Areas as venues, integrate with programs like Maple Syrup Festival.  4-31 - Build partnerships with groups already in action promoting local food through the NGO "Friends of the Greenbelt Foundation".  See also "Recognition" initiatives below.	✓	✓

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<b>4.4. Resource use</b>						
<b>Water Supply and Conservation</b>	All sectors	Increase water efficiency and conservation Rec. 141	York Region's Water for Tomorrow Program Peel Region's Water Smart Peel Program City of Toronto Water Efficiency Program	4-32 <b>Municipalities</b> - When water efficiency programs are updated, consider incorporating: <ul style="list-style-type: none"> <li>▶ rain-harvesting,</li> <li>▶ water efficient landscaping,</li> <li>▶ monitoring of water use rates,</li> <li>▶ pricing incentives,</li> <li>▶ recommendations from <i>Action Plan for Sustainable Practices</i></li> <li>▶ partnerships with schools and community groups.</li> <li>▶ increased incentives for adopting water efficient technologies for residents serviced by groundwater</li> </ul>	✓	✓
	All sectors	Reduce energy use and increase non-fossil fuel alternatives Rec. 144-151 Reduce waste Rec. 152-157	Greater Golden Horseshoe Mayors' Megawatt Challenge TRCA's Sustainable House Demonstration (Living City Campus at Kortright) Municipal waste reduction and management programs Renewable Energy Road Map (Ontario wide) Project Green – GTA Eco-industrial Park	Partners: Municipalities, utilities, school boards, BILD, TRCA 4-33 - Continue with existing programs 4-34 - Promote the development of Municipal Energy Management Plans and where appropriate District Energy Plans <b>4-35*</b> - Develop an outreach program based on the results from the Renewable Energy Road Map to promote the uptake of renewable energy technologies 4-36 - Promote standards such as Energy Star and green building certification (e.g. LEED, Green Globes) for new buildings	✓	✓
<b>4.5. Heritage interpretation</b>						
<b>Natural Heritage</b>	Local residents, general public, school students, Park and Conservation	Support Redside Dace Recovery Strategy Rec. 55 Improve recreational fishing opportunities	Existing programs include: <ul style="list-style-type: none"> <li>▶ Living City Campus at Kortright – many interpretive events and materials</li> <li>▶ Watershed on Wheels for school students Grades 1-6 provides in-class</li> </ul>	Partners: TRCA, municipalities, school boards, MNR, Ontario Streams 4-37 - Continue existing programs. See also Section 7 for educational benefits of volunteer monitoring.	✓	✓

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Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
Natural Heritage (continued)	Area visitors	Rec. 58	curriculum-based programming, free of charge; booked to full capacity every school year ► Albion Hills Field Centre Environmental Education Programs ► Lake St. George Field Centre Environmental Education Programs ► York Children's Groundwater Festival ► Peel Children's Water Festival ► City of Toronto's Discovery Walks Program ► Town of Richmond Hill's Walks on the Wild Side Outdoor Recreation and Environmental Awareness Program ► Citizen Scientist group (volunteers collect fish and invertebrate data)	<b>4-38* TRCA, NGOs, municipalities</b> - Organize annual community festivals or events and provide opportunities to learn about and celebrate the natural and cultural heritage of the Humber River (e.g. Heritage Day – February; World Water Day – March; Earth Day – April; International Migratory Bird Day – May; Canadian Rivers Day – June; Canada Day – July; World Fisheries Day – November). 4-39 Install educational signs about angling seasons, sport fish consumption, invasive species threats and how to avoid their spread at public access points to Humber Marshes, Étienne Brûlé Park (near Old Mill dam) and at existing fishways. 4-40 Install educational signs about reidside dace at Boyd Conservation Area and Living City Campus at Kortright and brook trout at Albion Hills Conservation Area.	✓	
		Interpret natural and cultural heritage Rec. 108-110 Form community partnerships Rec. 112, 113 Increase water efficiency and conservation Rec. 141				
Cultural Heritage	Local residents, general public, school students, Park and Conservation Area visitors, municipal heritage committees, Ministry of Culture	Interpret natural and cultural heritage Rec. 108-110 Develop active and participatory programs Rec. 77-83 Develop a living cultural heritage program Rec. 84	Existing programs include: ► Black Creek Pioneer Village – many interpretive events and materials ► Peel Heritage Complex ► King Township Museum ► TRCA Archaeological Field School ► Ontario Heritage Trust; provincial heritage plaque system ► Canadian Heritage site signs ► Municipal Heritage signage programs ► TRCA Multicultural Environmental Stewardship Program ► McMichael Canadian Art Collection ► Canadian Heritage Rivers System	See also Section 2 on Regeneration Partners: TRCA, Municipalities, NGOs 4-41 Continue existing programs.	✓	
		Rec. 77-83 Rec. 84		<b>4-42*</b> Develop pilot project for Ontario history and archaeology seminars for adults, featuring Humber watershed sites. Special attention to reaching out to new Canadians and descendants of the watershed as target audience 4-43 Build partnerships to provide learning opportunities and increase awareness of living culture, such as photography, drawing, painting and performance arts. 4-44 <b>TRCA</b> - Add cultural heritage content to the Multicultural Environmental Stewardship Program	✓	✓

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Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Cultural Heritage</b> (continued)				4-45 Identify candidate Heritage Conservation Districts and Cultural Heritage Landscapes for designation under the Ontario Heritage Act, in consultation with Municipal Heritage Boards.	✓	
				4-46 Provide expertise and resources to local ethnic groups to establish forms of public recognition of their culture (past and present) in the watershed, including First Nations groups as well as 19 <sup>th</sup> - 21 <sup>st</sup> century ethnic communities and influences.	✓	
				4-47 Develop a toolkit of interpretive materials (static and mobile signs or displays) that describe links between human and natural heritage (e.g. the influences of human activities on historic and current environments).		✓
				4-48 Develop and install signs for road and pedestrian bridges identifying the river's name, communities, streets and public buildings with historic names, trail guides/maps and public art.		✓
				4-49 Protect and interpret cultural features that also serve as wildlife habitat (e.g. barn owls shelter in active farm buildings, turkey vultures nest in old silos or barns).	✓	
				4-50 Build partnerships to enhance "living culture" interpretive and tourism opportunities in the Watershed (e.g. Identify architectural assets in need of restoration and look for opportunities to revitalize heritage properties by forming partnerships to increase revenue and find adaptive re-use, such as event facilities, restaurants, community centres, and art centres/performance spaces.)	✓	



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<b>4.6 Formal education</b>						
<b>Curriculum &amp; Program Development</b> <b>Sustainable Practices</b> <b>Natural and Cultural Heritage</b>	Ministry of Education, Boards of Education, TRCA	Develop active and participatory programs Rec. 83  Interpret natural and cultural heritage Rec. 108-110	Ministry of Education's has released a new vision for environmental education in Ontario's education system, <i>Shaping Our Schools, Shaping Our Future</i> , to help prepare students to be environmentally responsible citizens.  Ontario Ecoschools is a provincial program addressing climate change at a school and board level through programming that integrates what kids learn with how schools are run. Under the program, schools can achieve certification to recognize achievements in energy conservation, waste minimization, school grounds greening and ecological literacy.	<b>4-54*</b> Encourage all Boards of Education in the Humber watershed to participate in the Ontario Ecoschools Program and schools to achieve certification.	✓	✓
			TRCA owns and operates five year-round educational facilities (four of which are located within the Humber watershed):	4-55 Identify additional opportunities for TRCA's Archaeological Field School to contribute to the Ontario school curriculum on Aboriginal and pioneer life and develop a sustainable funding plan.	✓	
			<ul style="list-style-type: none"> <li>Albion Hills and Lake St. George - offering elementary and some secondary school students 2.5 or 5 day educational experiences covering environmental science, arts, leadership, and recreation programming and unique on-site stewardship programs.</li> <li>Living City Campus at Kortright and Black Creek Pioneer Village – offering day use facilities</li> </ul>			

**Table 4.1 Stewardship and Education Projects**

**Note: 1-1\* = top priority projects**

Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Curriculum &amp; Program Development Sustainable Practices Natural and Cultural Heritage</b> <i>(continued)</i>			<p>TRCA published <i>A Systems Thinking Curriculum for Learning in the Living City</i> (2006) to guide work in sustainability and environmental education.</p> <p>TRCA Watershed on Wheels Program provides in-class programs to Grade 1 to 8 students</p> <p>TRCA Aquatic Plants Program provides supplies and materials to propagate aquatic plants in the classroom and engage students in plantings at designated community wetland rehabilitation sites across the GTA.</p> <p>Investigating The Living City Spaces Program (TRCA) provides seasonal programming at unique places and spaces.</p> <p>Peel Region offers guided tours of the Peel Integrated Waste Management Facility, Lakeview Water Treatment Facility and Community Recycling Centre.</p> <p><i>Peel Water Story Curriculum Resource</i> provides a teacher-targeted resource in all Peel schools for presenting people's relationship to Peel's natural and human water systems, past and present including local water history and sustainable water practices.</p> <p>Peel EcoFair is an annual event showcasing environmental stewardship projects in Peel Schools.</p>	<p>4-56 Develop and deliver educational programs about First Nations heritage at Black Creek Pioneer Village and Living City Campus at Kortright, with involvement by cultural representatives, to assist schools with implementing the Ontario school curriculum</p>	<p>✓</p>	
				<p>4-57 TRCA, Ministry of Education, Boards of Education, – Re-introduce a High School environmental education credit course, which may include a watershed focus, to be taught at residential field centres.</p>	<p>✓</p>	

**Table 4.1 Stewardship and Education Projects**

**Note: 1-1\* = top priority projects**

Theme	Target Audience	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>4.7. Recognition programs</b>						
<b>Sustainable Practices</b>	Residents, businesses, agencies and institutions	Implement sustainable urban form Rec. 120 Prevent pollution Rec. 29 Manage the matrix Rec. 72	Federation of Canadian Municipalities awards for municipalities “Conservation Partner” sign provided by TRCA to private rural landowners that participate in stewardship programs Environmental garden awards (Toronto) Canadian Institute of Planners Ontario Professional Planners Institute Communities in Bloom Green Building Council Landscape Ontario	Partners: Everyone 4-58 Continue existing recognition programs and ensure that Humber watershed projects are profiled where appropriate. Consider establishing “leaders in sustainable practices” award in co-operation with high profile stakeholders and in co-ordination with a business leaders peer outreach program.	✓	✓
<b>Local Food First</b>	Institutions, restaurants and businesses, TRCA, federal and provincial agencies, GTA Agricultural Action Committee	Support local food and increase awareness of sustainable agriculture Rec. 132	TRCA has adopted a local food purchasing policy for its Food Services.	<b>4-59*</b> Adopt a local food procurement policy	✓	✓
<b>Cultural Heritage</b>	Public	Develop active and participatory programs Rec. 77-83	Ontario Archaeological Society Awards Governor General's Award for Excellence in Teaching Canadian History	<b>4-60 Ontario Archaeological Society –</b> Continue to provide profile for public cultural heritage programs and individuals who promote cultural heritage.	✓	✓

## 5. Operations and Maintenance

Property managers responsible for operations and maintenance of public property such as roads, parks and infrastructure, or private property such as golf courses, cemeteries or commercial/industrial lots, should consider ways they can incorporate the Watershed Plan's directions into their ongoing practices and programs. For example, naturalization schemes could be adopted as part of landscaping practices and thereby contribute to improved lot level water management and the achievement of our terrestrial natural heritage objectives.

Maintenance recommendations are noted within many of the strategies, however there are two significant recommendations for new formalized maintenance programs. First, our water strategies underscore the need for municipal operation and maintenance programs for stormwater management infrastructure, including the clean-out of accumulated sediment in ponds. Routine maintenance activities may present opportunities to optimize the performance of these stormwater management facilities through minor adjustments in operation, while larger maintenance projects may represent cost efficient opportunities to undertake major retrofit projects to improve facility performance.

The second new operations program being recommended relates to public lands in the Humber watershed. The nature-based recreation strategies identify the need for operational agreements for these lands, particularly with respect to responsibility and funding for operations, maintenance and enforcement.

**Table 5.1** sets out implementation projects for these and other operations and maintenance issues.



**Table 5.1 Operations and Maintenance Projects**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Stormwater Infrastructure</b> <i>(continued)</i>			<b>5-6* Municipalities</b> – Undertake retrofits of conveyance and end-of-pipe stormwater measures as part of road reconstruction projects to provide improved water quantity and quality control.	✓	✓
<b>Nature-based Recreation Facilities and Lands</b>	Recognize and enhance the regional system for nature-based recreation Rec. 89 Protect the unique experiences of the Humber greenspace system Rec. 103, 104 Develop plans to balance public access and resource protection Rec. 106, 107	There are many individual plans for nature-based recreation facilities e.g.: <ul style="list-style-type: none"> <li>▶ <i>Oak Ridges Corridor Park Management Plan</i></li> <li>▶ <i>Palgrave Forest and Wildlife Area Trail Plan</i></li> <li>▶ <i>Cold Creek Conservation Area Management Plan</i></li> <li>▶ <i>Boyd North and Glassco Park Management Plan</i></li> <li>▶ <i>Clairville Conservation Area Management Plan</i></li> </ul> A 213 km trail network has already been established by a variety of partners.  Agreement between TRCA and City of Toronto for operation and maintenance of TRCA-owned valleylands in Toronto.	5-7 <b>TRCA</b> , municipalities - Establish a multi-partner program with long term funding commitments and a funding formula to support maintenance and reinvestment in existing properties as well as further expansion and development of the regional system for nature-based recreation.  5-8 <b>TRCA</b> - Prepare management plans, including baseline studies of trail use, for: <ul style="list-style-type: none"> <li>▶ Bolton Resource Management Tract</li> <li>▶ Nashville Resource Management Tract</li> <li>▶ Albion Hills Conservation Area, Campground and Field Centre</li> <li>▶ North Peel Lands</li> <li>▶ Glen Haffy Conservation Area</li> </ul> 5-9 <b>Municipalities</b> , TRCA – Prepare management plans for public greenspace and natural areas being managed by municipalities.  5-10 <b>TRCA, municipalities</b> – Review plans to ensure adequate management strategies to protect unique experiences of the Humber greenspace system, amend plans where necessary, and continue to implement existing plans for individual areas.	✓	✓
<b>Other Public &amp; Institutional Properties</b>	Increase natural cover Rec. 3, 4 Prevent pollution Rec. 29	Some municipalities have environmental management programs for their properties (e.g. City of	5-11 <b>TRCA</b> - Prepare a map showing locations of public and institutional properties in relation to the TNHS and stormwater management priorities.	✓	

**Table 5.1 Operations and Maintenance Projects**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
(e.g. parks, community centres, schools, churches, cemeteries, golf courses, hydro corridors)	Restore and enhance natural cover Rec. 63, 64, 67 Manage the matrix Rec. 71, 72 Develop plans to balance public access and resource protection Rec. 106, 107	Toronto's environmental code for parks and community centres, Richmond Hill's natural heritage strategy is in progress)  Some golf courses are participating in the Audubon Program or similar programs to incorporate environmental considerations into management activities.	<b>5-12 TRCA</b> - Facilitate technical transfer among public and institutional landowners (e.g. regarding naturalization, invasive species, Canada geese, integrated pest management, stormwater management, pollution prevention etc).	✓	✓
<b>Transportation and Roads</b>	Prevent pollution Rec. 29 Manage the matrix Rec. 71, 72	Most municipalities and the MTO have snow disposal and road salt management plans.	<b>5-13 Municipalities, MTO</b> - Review and implement existing management and monitoring plans with consideration for new information arising from the <i>Humber River Watershed Plan</i> (e.g. groundwater recharge/discharge).	✓	
<b>Publicly-owned Agricultural Lands</b>	Provide GTA wide services for local farm businesses Rec. 125-129 Support local food and increase public awareness about sustainable agriculture Rec. 130-134 Implement policies to support agriculture Rec. 135-140	TRCA's new operating practice is to allow longer leases on its lands. An agricultural policy to foster sustainable farm operations is in preparation.  Environmental Farm Plans are being developed and implemented for TRCA owned farm lands.  TRCA has several projects underway in the Humber Watershed promoting urban agriculture and research into new crops for niche markets (e.g. Toronto Urban Farm, agreement with FarmStart for a training farm at Claireville CA, and an urban farm demonstration program at the Living City Campus at Kortright).	<b>5-14 Municipalities, MTO</b> - Review and adapt operations to minimize the impacts of transportation on natural heritage lands in the watershed.  <b>5-16 TRCA</b> – Continue policy supporting longer farm leases. Seek opportunities to celebrate near urban agriculture as an expression of culture, in addition to their roles in food production and land/water stewardship.  <b>5-17 Municipalities</b> - Other public landowners should recognize and support agriculture as a long term use (e.g. longer term leases) when leases come due.  <b>5-18 TRCA</b> - Seek farm tenants who are willing to test new crops and grow food for local markets on TRCA land.  <b>5-19 TRCA</b> - Co-ordinate farmland initiatives among public landowners in the GTA	✓	✓
<b>Flood and Erosion Risks</b>	Manage flood risks Rec. 30, 31	The GTA Flood Program provides services in four areas:	<b>5-20 TRCA</b> - Update the GTA Flood Program to achieve compliance with Provincial Guidelines ( <i>Ontario Flood Forecasting and Warning Implementation Guidelines for Conservation Authorities and MNR</i> ), when available.	✓	

**Table 5.1 Operations and Maintenance Projects**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<b>Flood and Erosion Risks</b> <i>(continued)</i>		<ul style="list-style-type: none"> <li>▶ Program delivery/administration</li> <li>▶ Forecasting</li> <li>▶ Communications</li> <li>▶ Flood operations</li> <li>▶ Flood and Erosion Control Programs (TRCA)</li> </ul>	<p><b>5-21 TRCA</b> - Continue:</p> <ul style="list-style-type: none"> <li>▶ Flood forecasting and warning program;</li> <li>▶ Real time precipitation and stream gauge network;</li> <li>▶ Flood vulnerable site database.</li> <li>▶ Operate and maintain Claireville Dam for flood control.</li> </ul> <p><b>5-22* TRCA</b> – Update the Claireville Dam operations manual</p> <p><b>5-23* TRCA</b>, municipalities – Undertake an annual proactive program of EA projects to implement high priority flood risk remediation projects identified through the TRCA Flood Protection and Remedial Capital Works Prioritization Project.</p> <p><b>5-24* Municipalities, TRCA</b> - Prepare flood emergency response plan for SPAs and flood vulnerable areas including an inventory of hazards, prioritization, and emergency response protocol.</p> <p><b>5-25* TRCA</b> - Track advances in prediction of regional and local climate change and re-assess local flood risks and management measures.</p> <p><b>5-26 TRCA, municipalities</b> – Establish and maintain an inventory of infrastructure “at risk” of damage from channel erosion and conduct regular monitoring. Identify a prioritized remediation plan.</p> <p><b>5-27 TRCA, MNR, municipal fire departments</b> - Review existing municipal and MNR fire response programs and prepare updated, co-ordinated plan including:</p> <ul style="list-style-type: none"> <li>▶ philosophy and principles</li> <li>▶ prevention</li> <li>▶ access</li> <li>▶ responsibilities and resources</li> <li>▶ emergency response protocol.</li> <li>▶ staff training</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
<b>Forest Fire Prevention and Emergency Response</b>	Implementation actions for forest fire prevention and response arose during development of the Implementation Guide and are not included in the final draft Watershed Plan.	Municipal fire departments MNR fire response program		✓	

## 6. Enforcement

Public education and awareness must be complemented by rigorous and co-ordinated enforcement. The *Humber River Watershed Plan* has identified that the enforcement capacities of the agencies (e.g. TRCA, municipalities, MNR, MOE, and DFO) are inadequate and should be increased. They should:

- ▶ identify and secure necessary resources;
- ▶ investigate means to improve partnering among relevant agencies;
- ▶ post signage using universal symbols and/or in multiple languages about permitted and non-permitted activities;
- ▶ promote public awareness of who to call and facilitate referrals of mis-directed calls; and
- ▶ adopt protocols for feedback to the public on actions taken.

**Table 6.1** summarizes implementation actions for enforcement.

**Table 6.1 Enforcement Actions**

Note: 1-1\* = top priority projects

Theme	Target Audience	Enforcement Responsibility (lead in bold)	Watershed Plan Recommendation	Existing Project or Program	Next Steps, Projects and Programs	Yrs 1 - 5	Yrs 6 - 10
<b>Fish</b>	Anglers Landowners	<b>DFO, MNR, and other partners</b>	Sect. 6.6 - Increase enforcement capacity	Inter-jurisdictional Compliance Protocol for Fish Habitat and Associated Water Quality (Ontario)	6-1 Continue existing program and identify plan for increasing enforcement capacity, as part of project 6-2.	✓	✓
<b>Poaching (wildlife)</b>	Hunters	<b>MNR</b>	Sect. 6.6 - Increase enforcement capacity	Report-A-Poacher telephone hotline	<b>6-2:</b> For each theme: ▶ Develop inter-jurisdictional compliance protocol ▶ Identify gaps in regulatory capability and capacity ▶ Identify options for addressing gaps ▶ Develop resources and implementation plan	✓	
<b>Water Use</b>	Water-takers	<b>MOE</b>	Increase water efficiency and conservation Rec. 141, 142	Permit To Take Water program		✓	
<b>Section 28 of CA Act (regulating water use from natural waterbodies; interference with watercourses or wetlands)</b>	Private land owners and municipalities	<b>TRCA</b>	Sect. 6.6 - Increase enforcement capacity	Inspection and compliance activities (TRCA)		✓	
<b>Municipal by-laws and regulations including: erosion &amp; sediment control, tree cutting, topsoil &amp; land disturbance, dumping, trespassing, encroachment</b>	Landowners Developers	<b>Municipalities, DFO</b>	Improve erosion & sediment control and site restoration Rec. 13-20 Sect. 6.6 - Increase enforcement capacity	Implementation of Greater Golden Horseshoe Area Conservation Authorities' <i>Erosion and Sediment Control Guidelines for Urban Construction</i>			✓
<b>Property Signage</b>	Public	TRCA and other public landowners, with NGOs	Sect. 6.6 - Increase enforcement capacity		6-3 Develop a co-ordinated program: ▶ NGO volunteers undertake an inventory of existing signage and identify gaps/deficiencies ▶ Landowners improve signage	✓	

## 7. Monitoring

Ongoing monitoring will be essential to identify whether the management strategies in this Watershed Plan are effective and adapt them if necessary. For example:

- ▶ Are the management measures performing as designed?
- ▶ How are environmental conditions responding?
- ▶ Do we need to change our strategies and if so, how?

Specific actions to improve monitoring programs are listed in the tables below, in three broad areas:

### Evaluation of Innovative Technologies

Our strategies for water (*Humber River Watershed Plan*, Section 5.3.1) describe TRCA's Sustainable Technologies Evaluation Program (STEP) and recommend long-term support to ensure that it continues to provide a valuable forum for co-ordinated technology performance monitoring and evaluation among a number of agencies and private partners (**Table 7.1**).

### Ambient watershed conditions and long-term trends

The Regional Watershed Monitoring Program (RWMP), led by TRCA in partnership with its member municipalities and other monitoring groups, provided a substantial information base for this Watershed Plan. The RWMP was developed based on regional and watershed scales and to the extent possible at the subwatershed scale. During the preparation of this Plan, it was found that additional information is needed at both the watershed and subwatershed scales to fully understand systems in the Humber watershed (**Table 7.2**).

### Adaptive Management

The *Humber River Watershed Plan* recommends an adaptive management program that will use feedback from monitoring activities to make adjustments to policies, plans and programs to ensure that our goals, objectives and targets are met (**Table 7.3**).

**Table 7.1 Evaluation of Innovative Technologies**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<p><b>Sustainable Technologies Evaluation Program</b></p>	<p>Rec. 40 - Test evaluate and promote innovative technologies using the Sustainable Technologies Evaluation Program (STEP)</p>	<p><b>7-1* TRCA</b> - Identify technologies that show promise and monitor their performance using STEP, e.g.</p> <ul style="list-style-type: none"> <li>▶ rainwater collection and re-use</li> <li>▶ permeable pavement</li> <li>▶ groundwater and soil contamination risk with infiltration technologies</li> <li>▶ solar, wind and geothermal energy</li> <li>▶ long term performance and maintenance costs of any green technology</li> </ul> <p><b>7-2* TRCA</b> - Assess life cycle costs relative to conventional alternatives using the Athena Sustainable Materials Institute life cycle costing tool. (This is becoming a standard part of STEP evaluations because it is usually very difficult to promote new technologies without analysis of costs and savings).</p>	<p>✓</p>	<p>✓</p>
<p><b>Sustainable Community Design Effectiveness</b></p>	<p>Rec. 38 - Monitor the effects of new and retrofitted urban development design and stormwater management practices and implement adaptive management where necessary</p>	<p><b>7-3 TRCA</b> - Develop checklists of considerations for the siting and review of wind and solar farms, and closed loop geothermal systems.</p> <p><b>7-4 TRCA, municipalities, MPIR, BILD</b> - Convene discussions with MPIR and determine mechanisms for requiring developers in the Growth Plan area to monitor sustainable technologies and other innovative design features to ensure targets are met.</p> <p><b>7-5 TRCA, MOE, municipalities, BILD</b> - Develop compliance monitoring protocols for SWM and other sustainable technologies.</p> <p><b>7-6* TRCA, municipalities</b> – Launch a cumulative effects (i.e. effectiveness) monitoring program for innovative development design:</p> <ul style="list-style-type: none"> <li>▶ Review suitability of candidate subwatersheds or reaches: Centreville Creek, Purpleville Creek, West – Main Branch (i.e. availability of baseline info, stage of development, suite of innovative practices).</li> <li>▶ Define research questions</li> <li>▶ Ensure adequate baseline monitoring and establish ongoing monitoring network</li> </ul>	<p>✓</p>	<p>✓</p>



**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

Note: 1-1\* = top priority projects

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<b>Regional Watershed Monitoring Program (RWMP)</b>	Rec. 39 - Continue the RWMP with enhancements Section 6.7	<b>7-7*</b> TRCA - Review recommendations for additional RWMP sites in the Humber watershed, as noted below, as part of the 5 year review and update. Priorities are also noted below.	TRCA should continue to implement the RWMP in order to provide data on ambient conditions and long term trends. Specific program improvements are outlined below.	✓	
<b>Climate Change</b>	Rec. 30 TRCA should: ▶ Track advances in the prediction of regional and local climate change and reassess flood risks  Rec. 39 - Continue the RWMP with enhancements Section 6.7	<b>7-8 Environment Canada, TRCA</b> - Continue to collect data in the Humber watershed to track changes resulting from global climate change (i.e. climate, stream flow, groundwater level).  See also Section 5 on Operations, Management and Maintenance (Flood Control Program study recommendations)	Uncertainty associated with the likely degree and timing of changes to climate within the Humber watershed creates challenges for developing comprehensive strategies that will help watershed communities adapt.	✓	✓
<b>Air Quality</b>	Undertake a vegetation impacts study Rec. 44	<b>7-9 Universities, MOE, TRCA</b> - Initiate a GTA-wide study to determine the economic and ecological impacts of poor air quality on local agricultural crops, urban forest and natural heritage. This will require the installation of more ozone monitors in each watershed.	A better understanding of the economic and ecological impacts of poor air quality on agriculture, urban forests and natural heritage would provide a strong rationale for governments and citizens to take further actions to reduce air pollution.	✓	✓
<b>Precipitation</b>	Rec. 39 - Continue the RWMP with enhancements Section 6.7	<b>7-10 TRCA</b> - Upgrade existing precipitation gauge at the Claireville Flood Control Dam in Brampton to a four season weigh gauge	Existing precipitation gauges in the GTA do not measure snowfall as accurately as can be achieved with a four season weigh gauge. More accurate snowfall information would help to confirm or refine water budget and hydrologic models used to design stormwater controls in new developments. The Claireville Dam location would provide more accurate snowfall information for urban climate conditions in the region.	✓	
<b>Evaporation</b>	Rec. 39 - Continue the RWMP with enhancements Section 6.7	<b>7-11*</b> Environment Canada, TRCA - Establish evaporation monitoring stations in Greater Toronto Area (rural and urban locations).	Long-term measured evaporation data is currently unavailable for locations in the Greater Toronto Area (nearest station is in Hamilton). Measured evaporation information would help to confirm or refine water budget and hydrologic models used to design stormwater controls in new developments.	✓	

**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<p><b>Groundwater</b></p>	<p>Rec. 39 - Continue the RWMIP with enhancements Section 6.7</p>	<p><b>7-12*</b> TRCA - Seek additional funding partnerships to install nests of groundwater monitoring (water level and groundwater quality) wells at three (3) additional sites in the watershed to improve spatial coverage and at various depths to improve knowledge of each of the three major aquifers. Potential locations include:</p> <ul style="list-style-type: none"> <li>▶ Existing York Region well on TRCA property south of Living City Campus at Kortright (Vaughan)</li> <li>▶ Location to be identified through new gravity surveys (see project 7-13) or other approaches</li> </ul>	<p>There are currently ten (10) Provincial Groundwater Monitoring Network (PGMN) wells installed in the Humber watershed. These wells provide a good spatial distribution over the watershed but there is no well monitoring the water level in the Oak Ridges Aquifer Complex in the East Humber (King, Vaughan, Richmond Hill). It is recommended to monitor at least one well in each aquifer unit existing in each primary subwatershed. This would require adding six (6) new monitoring wells to the network.</p> <p>Therefore, we recommend adding three new locations with 2-3 wells at each location. These new wells should be located to assess water level changes in aquifers that discharge at surface water flow gauge locations as well as to facilitate the assessment of both regional and local effects of urban development and land conservation. It may be possible to either assume responsibility for or obtain data from existing monitoring wells installed by others, and the exact locations can be flexible, as long as they provide reasonable geographic coverage of the watershed. Without such coverage, TRCA will not be able to evaluate groundwater flow patterns and gradients in the Humber watershed, and information will not be available to further calibrate the groundwater model.</p> <p>The priority for these new wells is considered to be high, since it is not possible to accurately validate the groundwater flow model or assess hydrogeologic conditions without field observations. Wells in other watersheds, particularly in the Credit River, Nottawasaga River and Lake Simcoe watersheds, could be used to assist in assessing groundwater flow patterns, but this does not eliminate the need for adequate geographic coverage of the Humber watershed.</p>	<p>✓</p>	

**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

**Note:** 1-1\* = top priority projects

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<b>Groundwater</b> (continued)		<b>7-13*</b> York, Peel, Durham and Toronto – Conduct new gravity survey of Laurentian bedrock channel between Weston Rd. and Jane St. in Vaughan through YPDT Groundwater Management Project.	Current understanding of groundwater flow and levels along the southern portion of the underground bedrock channel where the East Humber subwatershed and Don River watersheds meet is limited. A new gravity survey of this area would help to find a suitable location for new monitoring wells (see project 7-12).	✓	
<b>Surface Water</b>	Rec. 30 TRCA should - Continue to develop and enhance the real time precipitation and stream gauge network for use in the TRCA Flood Warning Program Rec. 39 - Continue the RWMP with enhancements Section 6.7	<b>7-14*</b> TRCA - New permanent stream flow gauges with telemetry equipment to allow real-time access should be installed on: <ul style="list-style-type: none"> <li>▶ main channel of the Humber River between Hwy. 7 and Steeles Ave. in Vaughan.</li> <li>▶ Black Creek (main channel) at Hwy. 401 in Toronto.</li> <li>▶ main channel of Humber River around Queen St. and King St. in Bolton.</li> <li>▶ Black Creek at Steeles Avenue in Toronto.</li> </ul>	Additional and upgraded stream flow gauges are recommended to provide information needed to further calibrate hydrologic models and increase TRCA capacity for flood forecasting and warning in flood vulnerable areas.	✓	

**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

**Note:** 1-1\* = top priority projects

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<b>Surface Water</b> <i>(continued)</i>		<p>7-15 TRCA – Upgrade existing stream flow gauges with telemetry equipment to allow real-time access:</p> <ul style="list-style-type: none"> <li>▶ East Humber at Pine Grove in Vaughan (TRCA# 25, WSC# 02HC0009)</li> <li>▶ Black Creek at Weston Road in Toronto (TRCA# 9, WSC# 02HC027)</li> <li>▶ Lower Humber at Weston Road south of Lawrence Avenue in Toronto (TRCA# 8, WSC# 02HC003).</li> </ul> <p>7-16 <b>TRCA</b> – Identify indicators, establish baselines and set targets for a natural range of variation of stream flow. Establish baselines for these indicators using available RWMP stream gauge data and evaluate progress towards targets through Report Cards</p>		<p>✓</p>	
			<p>Maintaining a natural range of variation of stream flow will help to achieve stream form and aquatic system objectives of the Watershed Plan. Indicators and targets have not yet been defined for a natural range of variation of stream flow. Indicators, information on baseline conditions and targets will be needed to evaluate the effectiveness of innovative stormwater technologies and community designs through the proposed effectiveness monitoring program (Project 7-6, <b>Table 7.1</b>).</p>	<p>✓</p>	

**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<b>Stream Form</b>	Rec. 39 - Continue the RWMP with enhancements Section 6.7	<p><b>7-17* TRCA</b> - Establish additional fluvial geomorphology monitoring sites immediately downstream of areas of future urban expansion. They should be established as soon as possible to determine an existing conditions baseline and should be monitored annually, probably for at least 20 years:</p> <ul style="list-style-type: none"> <li>▶ Purpleville Creek at Major Mackenzie Drive in Vaughan</li> <li>▶ King Creek around Woodhill Avenue south of King Road in Nobleton</li> <li>▶ Centreville Creek just upstream of Scott Lake, west of Innis Lake Road in Caledon East</li> </ul>	The additional sites are needed to establish baseline stream form and rates of change to evaluate the effectiveness of innovative stormwater technologies and community designs through the proposed effectiveness monitoring program (Project 7-6, <b>Table 7.1</b> ).	✓	
<b>Water Quality</b>	Rec. 39 - Continue the RWMP with enhancements Section 6.7	<p>7-18 <b>TRCA</b> - Enhance the current monitoring protocols at the established fluvial geomorphic monitoring sites (i.e. additional cross-sectional surveys, greater frequency)</p> <p><b>7-19*</b> TRCA - Establish new RWMP surface water quality sampling stations on:</p> <ul style="list-style-type: none"> <li>▶ East Humber River at stream gauge near Mill Road south of King Road in King Township.</li> <li>▶ Purpleville Creek at stream gauge near Major Mackenzie Drive in Vaughan.</li> </ul>	Enhanced monitoring at existing stations, which currently do not generate enough data to reliably track some aspects of channel change, will provide benefits for future watershed and subwatershed studies in the Humber watershed.	✓	
			Understanding of ambient surface water quality conditions is lacking in the headwaters of the East Humber River. Information from additional RWMP sampling stations would be used in flow integrated water quality analyses to better predict how pollutant levels are affected by changes in stream flow and would contribute to evaluating the effectiveness of innovative stormwater technologies and community designs through the proposed effectiveness monitoring program (Project 7-6, <b>Table 7.1</b> ).	✓	

**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<b>Water Quality</b> (Continued)		<p>7-20 <b>Municipalities, TRCA</b> - Conduct monitoring studies on a project basis to answer specific questions, e.g.:</p> <ul style="list-style-type: none"> <li>▶ effectiveness of road salt management plans;</li> <li>▶ bacteria source monitoring – pending the outcome of the Environment Canada source tracking study; and</li> <li>▶ short term (2-3 year) wet weather monitoring at RWMP station #83103 on West Humber River.</li> </ul>	In order to more accurately identify sources of pollutants of concern and to evaluate the effectiveness of management actions, special water quality monitoring studies are needed.		
<b>Aquatic System</b>	<p>Rec. 49 Conduct formalized in-stream barrier surveys to further prioritize mitigation work</p> <p>Rec. 53 – Monitor populations of reidside dace in collaboration with the Redside Dace Recovery Team</p> <p>Rec. 39 - Continue the RWMP with enhancements Section 6.7</p>	<p><b>7-21* TRCA, MNR, NGOs</b>, anglers, volunteers - Develop a volunteer-based detection program for aquatic invasive species (i.e. Round goby, rusty crayfish); focus on Lake Wilcox, Lower Humber and Purpleville Creek.</p> <p><b>7-22* MNR, TRCA</b> – Evaluate the effectiveness of in-stream barrier mitigation and aquatic species partition barrier projects, as recommended in the <i>Humber River Fisheries Management Plan</i></p>	<p>Aquatic habitats in parts of the Humber watershed are at risk of invasion by alien aquatic species that could negatively impact habitat quality and communities of native species. Establishing a formal program for reporting observations of alien aquatic species would help trigger preventative and corrective management actions.</p> <p>Limited information is available on the effectiveness of projects that have been completed in the Humber watershed to mitigate in-stream barriers to fish movement and aquatic species partition barriers. Evaluations of completed projects should be done and used to inform future projects.</p>	✓	✓
<b>Terrestrial System</b>	<p>Rec. 39 - Continue the RWMP with enhancements Section 6.7</p>	<p><b>7-23* TRCA</b>, municipalities, NGOs, volunteers – Establish fixed plots throughout the TRCA jurisdiction and monitor vegetation communities and flora and fauna species regularly.</p> <p>7-24 <b>TRCA, MNR</b> - Identify indicators, develop monitoring protocols, establish baselines and set targets for biodiversity. Evaluate progress towards targets through Report Cards</p>	<p>In order to detect trends in terrestrial ecosystem health and species populations over time, sampling of fixed plots on a more frequent basis than is done through the RWMP is necessary.</p> <p>Maintaining and improving regional biodiversity is an objective of the TRCA and of the Watershed Plan. A full suite of indicators, monitoring protocols and targets have not yet been defined for biodiversity. This information is needed to evaluate effectiveness of management strategies and programs.</p>	✓	✓

**Table 7.2 Ambient Watershed Conditions and Long-term Trends**

**Note: 1-1\* = top priority projects**

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs	Justification	Yrs 1 - 5	Yrs 6 - 10
<b>Nature-based Recreation</b>	Rec. 106 Develop plans for public access Rec. 107 Undertake studies to define thresholds for public access in order to protect sensitive ecological or cultural areas	<b>7-25*</b> TRCA, Municipalities - Develop and implement a program to monitor trail use and participation rates in other related recreational activities.	The lack of data on use of nature-based recreational opportunities in the watershed limits our full understanding of issues and ability to balance public access and resource protection.	✓	

**Table 7.3 Adaptive Management**

**Note:** 1-1\* = top priority projects

Theme	Watershed Plan Recommendation	Next Steps, Projects and Programs (lead partner in bold)	Yrs 1 - 5	Yrs 6 - 10
<p><b>Monitoring and Adjustments</b></p>	<p>Section 6.7 Develop an adaptive management program</p>	<p>7-26 <b>TRCA</b>, municipalities – Develop an adaptive management program</p> <ul style="list-style-type: none"> <li>▶ Review the adequacy of existing monitoring mechanisms, including additions noted in <b>Table 7.2</b> (e.g. RWMP and requirements for compliance and cumulative effects monitoring).</li> <li>▶ Identify any necessary modifications to existing analytical, assessment and reporting protocols.</li> <li>▶ Define triggers for initiating adjustments to policies, plans, implementation and management.</li> <li>▶ Identify the mechanisms and procedures for engaging watershed partners in a process for amending the Watershed Plan and relevant policies and programs.</li> <li>▶ Secure commitment to implement the program.</li> </ul>	<p>✓</p>	<p>✓</p>

## Section 8 – Tracking Progress

TRCA is proposing to convene an annual multi-stakeholder forum to report on progress at implementing the Watershed Plan and confirm priorities for the following year. Particular attention will be given to the status of top priority implementation projects recommended in this Implementation Guide. Other unanticipated opportunities will be considered as well based on criteria such as partner contributions, expected outcomes and future benefits. Changes and trends in watershed conditions will be monitored through programs such as the Terrestrial Natural Heritage Program and Regional Watershed Monitoring Program. Results will be periodically reported by TRCA with the assistance of the Humber Watershed Alliance through the publication of progress reports, report cards and other appropriate media.