Community Experiences in Urban Forestry

Volume 1

IN A FORESTRY AND NATURAL SCIENCE SERIES FOR COMMUNITY DECISION MAKERS

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Elizabeth Holmes
Eastern Ontario Model Forest

The Eastern Ontario Model Forest is proud to have, and wishes to acknowledge, the significant support of the Government of Canada, through the Canadian Forest Service of Natural Resources Canada. The Canadian Forest Service is the originator of the model forest concept, and working together with the other founding partners of the Eastern Ontario Model Forest – the Ontario Ministry of Natural Resources, the Mohawk Council of Akwesasne, and Domtar Communication Papers – has been the main catalyst for several hundred partners, members, supporters and residents to work towards the vision of forests for seven generations.

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- CASE STUDIES -

- FOREWORD -

The relationship between trees and humans in settled landscapes has been, and will continue to be, a turbulent one. Most of us are familiar with stories of the pioneering days in our region when the first European settlers struggled to clear the land to establish farms and communities. There is also a rich history, however, of the struggle to restore trees to the landscape as the winds began to blow the soil away and to plow snow into deep drifts in roadways and farmsteads. A similar trend followed the establishment of our towns and villages, many of which would grow and coalesce into cities. The removal of trees and forests that stood in the way of progress was usually followed by the planting of trees to improve the appearance of streetscapes and parks and to enhance the general quality of life.

In more recent years the establishment and protection of trees in communities has been driven by far more than aesthetics. The roles of our urban forests in the improvement of air quality, sequestering atmospheric carbon, storm water management, and the provision of many other environmental, social and economic benefits have been quantified and supported by research. While many communities struggle to establish trees in areas with poor canopy cover or to protect other areas blessed with an established urban forest of large trees, urban sprawl and intensification continue to consume trees and the space to grow them. We can now estimate the amount of pollution trees can remove from the air, but the same trees suffer from the impacts of poor air quality. We promote the planting of trees in an effort to stem the tide of climate change, but the forest suffers from ice storms, high winds, droughts and the other harbingers of a changing climate that most in the scientific community agree is well underway. Aesthetic appeal and the difficult growing environment in our urban areas have resulted in the selection of some attractive and incredibly resilient cultivars of trees and shrubs. Unfortunately, our over-reliance on these relatively few selections has left us with urban forests that are vulnerable to a new onslaught of invasive insects such as the emerald ash borer and Asian long-horned beetle.

If we are to enjoy the many ecological, economic and social benefits that a healthy and diverse urban forest can provide then we will need a comprehensive and strategic approach to urban forest management. Such an approach must be based on a clear understanding of “where you are” and “where you want to be”. It is only relatively recently that communities have begun to develop that detailed understanding of “where they are” by conducting inventories of their urban forests. For decades, energetic volunteers have planted trees and in some cases tended them through the first few years of establishment. It is only relatively recently that the critical longer-term tasks of stewardship have received similar attention.

There is still a prevailing view that municipalities are responsible for the stewardship of our urban forests but in most communities 75 to 90 per cent of the trees are located on private property, so it is clear that the conservation and enhancement of the resource cannot be secured without the long-term and strategic involvement of private landowners and citizens. *Community Experiences in Urban Forestry* provides a glimpse into the some of the innovative ways that some community groups, NGOs, municipalities and dedicated individuals have grasped the opportunities and challenges facing the forests of our settled landscapes. The trend is clear, exciting times are ahead.

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- INTRODUCTION -

In our mind's eye we will see the Ecosphere, see ourselves as willing constituents of it, appreciating the creative bonds that join us to it. And what we know – not superficially but in our hearts and imaginations – has great power over how we act.
***Stan Rowe*, Home Place: Essays on Ecology**

The vast majority of Canadians make their homes in urban settings. Although the work opportunities and amenities afforded by urban settings are sometimes the calling card that draw people, so too are the natural heritage features that exist in the form of various greenspaces (forests, parks, trails) and waterways.

With growth comes pressure on these natural heritage features, and our urban forests are no strangers to the forces of development, sprawl and fragmentation. It is easy to lose sight of the fact that urban forests, like their "wilderness" counterparts, are ecosystems, and need to be nurtured as such.

The purpose of *Community Experiences in Urban Forestry* is to bring attention to some of the critical issues in our urban forest ecosystems and, more importantly, to highlight some of the many community successes in responding to these issues. Case studies representative of the Great Lakes-St. Lawrence forest region speak to issues that range from climate change and the threat of invasive exotic species, to questions surrounding the lack of capacity and support for urban forestry efforts, and the role of urban forests in mitigating environmental degradation in the broader settled landscape.

Compelling stories of success come from various communities—big and small—highlighting innovative tools and approaches, as well as an underlying passion for our urban forest ecosystems: Ottawa's use of CITYgreen™ as a planning aid; the community of Gananoque's commitment to forest inventorying; Toronto's experience in responding to the arrival of the Asian long-horned beetle; visionary greenspace master planning in Ottawa; Carleton Place's tree planting program for homeowners; educational databases of native tree species; a community atlas for the Thousand Islands which identifies significant woodlands, wetlands and wildlife; ACER's climate change monitoring efforts involving local students; Limerick Forest Advisory Committee's valuable volunteer-based activities; Toronto District School Board's partnership in developing a long-term tree inventory management plan for area schools; and culturally-inspired naturalization efforts within the Mohawk community of Akwesasne.

Contact information associated with each of the case studies is included as a means of fostering a sharing of experiences, inspiring community mentoring efforts, and encouraging collaboration amongst local decision makers. A Resources section also provides useful points of reference for more information.

By no means is the roster of issues addressed in this publication meant to be exhaustive. There are many other forest- and natural heritage-related issues that span the urban and rural context; so many in fact that our intention, over time, is to produce a series of "Community Experiences" volumes, this being the first.

Community Experiences in Urban Forestry concludes with an overview of future challenges and opportunities, not before issuing a challenge to each and every one of us, however, in the form of becoming a participant in the National Tree Planting Challenge.

Ultimately, the hope is that this publication will serve as a source of inspiration for all, as we look to further nurture and enhance our urban forest ecosystems.

Elizabeth A. Holmes
Eastern Ontario Model Forest

Understanding the urban forest resource

CASE 1:
GANANOQUE FORESTREE ADVISORY COMMITTEE
— Peter Murray

Gananoque was founded in 1792 by Col. Joel Stone, on the banks of the Gananoque and St. Lawrence rivers. The town, with a current population of 5,000, was fortunate in that some people in the nineteenth and early twentieth centuries planted many hard maple trees and other species on town road allowances, and in their back yards. Old photographs show a profusion of healthy, young hardwoods lining the streets. By the late twentieth century, many of these trees were past their "best before" time, and were having to be removed. In 1996, this factor prompted some concerned citizens, with the support of the Mayor and Town Council, to form a volunteer group which became the Gananoque Forestree Advisory Committee (GFAC). The objective: to stabilize and improve the state of the town's urban forest, by identifying needs and providing input into policy for long range planning for the protection, conservation, planting and maintenance of the town's trees, both public and private. The GFAC became pro-active. It established a nursery of spruce, white and red pine, red oak and green ash, 2,000 trees in total. These are now planted in the town and surrounding area. We ran a citizen arborist course, had numerous information clinics and urban forest presentations, produced two brochures and several "how to" pamphlets. We were responsible for planting or assisting in having over 800 caliper-size trees planted in the town. We promoted the pitch pine as the official tree of Gananoque, and produced heritage and hazard tree programs. Over the years, we have answered hundreds of questions from citizens on tree care. Volunteers have pruned many of the caliper trees planted. An Urban Forest Management Plan for the town is in preparation. All this and more was accomplished, with 10 to 15 volunteers.

One of the first questions asked by the new organization was "what do we have in our 'urban forest', (a new concept to many)? What species, age, condition, location, ownership, by-laws, and, yes, interest does Gananoque contain?" An inventory was required. While local knowledge and guesstimates are both assets, they did not appear to be an adequate basis for plans and action. Information sources were researched, and volunteers recruited.

Then came the ice storm of January

1998. This disaster presented several opportunities and challenges for our newly formed committee. First, the GFAC volunteers made an assessment of the damage to the public trees within developed areas which provided information for requesting assistance and for post-storm clean-up. Second, it gave us the initiative and resources to tackle the complicated process of producing a reality inventory. We simplified the urban forest inventory system developed by Dr. Andy Kenney of the University of Toronto, and completed the field and office work with volunteers and some consultant help from the ice storm funding. One of our main problems was finding enough knowledgeable volunteers to identify species and evaluate tree condition. An HRDC summer work program supplied a student to enter the data into a computer format. A consultant summarized the data for us. The results were informative and useful as a snapshot of the town's urban forest. Sorry to say, we did not keep the data properly updated, and the inventory is of academic interest now. In 2002, with the help of a local environmental coalition, a computer expert digitized the Ontario Ministry of Natural Resources aerial photos of the town and adapted a program to use a GPS system for tree location. Again, a lack of skilled volunteers available for tree identification and evaluation was a constraint. Our system was to record information for each tree positioned by the GPS and located on the digitized photo map. The finished product would, we hoped, be put on the town data system, and updated annually with input from the town works department and/or volunteers. Our objective was to establish a perpetual inventory. Sadly, this initiative, though partly done, was never completed for lack of funding and volunteers.

Analysis of the inventory projects – and indeed all aspects of our GFAC activities – generates a number of observations.

The availability in smaller communities of skilled or trained people willing or able to commit to the work required for an inventory is a limiting factor. People can be trained to some degree, but the amount of time necessary for accurate data collection and processing is very difficult for working people, and daunting to retirees. This is an unfortunate fact, and a situation that must be addressed and resolved before proceeding.

In the smaller community, there is a perceived lack of the need for an intensive inventory. It is desirable to be able to include in a report, for example, that there are *x* number of over-mature sugar maples on the streetscapes, and that there is a predominance of Norway maple within the town. But both these facts were apparent before our original inventory. In time, it became obvious to us that a viable operating plan can be prepared for a community of our size without a detailed inventory. We suspect, however, that any urban area with a population of 15 to 20 thousand, and a dedicated forestry department, will require a detailed inventory. It soon became apparent that a "needs" survey of potential planting sites on public land was required to facilitate the planning for acquisition of suitable planting stock. And indeed, a survey of the location of the most obviously decadent trees was also needed. Both were done by a few experienced individuals systematically walking the streets, and making notes on their observations.

Perhaps the most important aspect for any community urban forest program is the need for a few dedicated volunteers who will continue to keep the town administrators and the public interested and aware of the value of an urban forest, and the need to perpetuate its maintenance. Although true of any successful committee, the need for a core of committed, knowledgeable people is particularly critical for an urban forest program and a key to getting things done.

"...the most important aspect for any community urban forest program is the need for a few dedicated volunteers..."

The GFAC and its successes can be attributed not only to those dedicated volunteers, but also to the support of the Town of Gananoque, the service clubs of the town, the Leeds County Stewardship Council, the Eastern Ontario Model Forest, the Cataraqui Region Conservation Authority, and HRDC job creation programs. The Urban Forest Council and the Canadian Urban Forest Network have proven to be a great source of inspiration and information.

To paraphrase the educators, "it takes a community to raise a tree". The satisfaction that volunteers can get from watching the trees they have nurtured into healthy, attractive members of the community is a priceless reward.

— Peter Murray
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Lack of long-term

comprehensive strategic planning for urban forest ecosystems

CASE 1:
A GREENSPACE MASTER PLAN FOR OTTAWA— STRATEGIES FOR OTTAWA'S URBAN GREEN SPACES

— Nelson Edwards

There are many initiatives in the Ottawa area that address the management of our community woodlots, forest and natural areas. However there is also a more strategic interest in the planning and protection of greenspace – including natural land, and open space and leisure areas.

In 2006, the City of Ottawa approved the *Greenspace Master Plan - Strategies for Ottawa's Urban Greenspaces*. The master plan expresses the city's vision for greenspace in the urban area, identifies a Greenspace Network, and establishes polices and actions to achieve that vision. This plan guides the many local initiatives underway to ensure that they contribute to a greater vision.

Ottawa residents are passionate about their greenspaces because the city's parks and forests are the source of a great deal of the pleasure that comes from living here. These greenspaces are the legacy of visionary community builders in the past: federal planners who constructed scenic parkways radiating outwards from Parliament Hill, homebuilders who built communities for returning veterans around central parks and playgrounds, local municipal councillors who assembled land along rivers and other waterways well before the first houses appeared.

While Ottawa can be proud of this green heritage, it cannot be complacent. With a population projected to increase by almost 50 per cent by 2021, the city will be hard-pressed to maintain the high standards of the past as new neighbourhoods are built and established ones redevelop. Fortunately, the city has never been better positioned to meet this challenge: with amalgamation of 11 local municipalities and a regional government in 2001, a single municipal government is now in place to provide leadership and pursue a greenspace vision in partnership with other levels of government, the private sector and the community.

Our Vision

Greenspace has been a powerful planning element that has shaped the character and quality of Ottawa for more than a century. The Greenspace Master Plan builds on this legacy and proposes actions for the city to carry this tradition forward as our community grows.

The Greenspace Master Plan is based on the vision that as the city grows there is to be an adequate supply of greenspace accessible to all residents. It will be linked, to allow for movement through green corridors, and it will be high quality and sustainable, minimizing the need for human intervention and public spending.

Building our Set of Greenspaces

Through consultation we learned that the community's perspective of greenspace is broad and takes in a continuum of lands, ranging from waterways and remnant woodlands to manicured downtown pocket parks. It also includes lands that are not usually considered as greenspace, such as stormwater management areas and other infrastructure lands, along with the landscaped lands around major institutions and business parks.

One of the major accomplishments of the Greenspace Master Plan is an inventory of all the greenspaces in the urban area showing which spaces are the most valuable in terms of their contribution to natural lands, or open space and leisure uses.

A Focus for our Vision – A Greenspace Network

The Urban Greenspace Network is the focal point of the community's greenspace vision and a fundamental premise of the master plan. The Urban Greenspace Network is a continuum of natural lands and open spaces that builds on the wide diversity of lands recorded in the inventory. These network lands support and enhance both the environmental and leisure functions and, in time, could connect every home in Ottawa to a larger network of greenspace spanning the urban area and reaching out to the greenspaces in the surrounding rural context.

The idea of a network approach to greenspaces is based on the principles of landscape ecology and an ecosystems approach to land use planning and management. A systems perspective frames decisions for one element of the system on an understanding of the implications for other elements of the system. It helps us to identify opportunities to build or restore the system by guiding land development, acquisition, and management. Greenspaces function on different levels and, as a result, have different but compatible ecological and social functions that together create a system that is more effective and stronger than if it were fragmented. When the system is compromised, habitats decline and animal populations are lost; dispersed parks and open spaces are not easily accessible; and environmental mitigation by natural processes is weakened and requires significant intervention and public investment to restore.

The Greenspace Network is both a physical entity and a core concept that can be used to plan the city. As a connected and protected physical network of natural lands and open spaces, the network can constitute the permanent, defining feature of the city's physical form where it may grow and what areas should be protected. As a concept, it can guide public decision making and creation of the network.

From Plan to Action

The move from plan to action required specific strategies and further work to protect greenspace, complete the network, and change the city's day-to-day business practices.

Although much of this network now exists, many key linkages and features are yet to be secured. The Greenspace Master Plan identifies these gaps and proposes strategies to secure greenspaces and complete the network.

Several ongoing initiatives will help to build the Urban Greenspace Network and add to the city's greenspace lands. These include:

- Implementing the 2006 *Urban Natural Features Study* that evaluated all of the natural areas remaining in the urban area; it will serve as a basis for a strategy to secure the priority sites through acquisition and other means;
- Addressing the significant shortfall in large sports fields by implementing an existing 2006 strategy to create more sites through partnerships;
- Implementing key sections of the recreational pathway system identified in the *Pathway Network for Canada's Capital Region: 2006 Strategic Plan* prepared in partnership with the National Capital Commission and the City of Gatineau;
- Preparing a "Green Street Strategy" that explores ways to connect the Urban Greenspace Network and contributes to the greening of municipal roads and infrastructure.

In addition to these and other ongoing initiatives, the city can build the Urban Greenspace Network and pursue its greenspace objectives by adopting a "Greenspace Also" approach to municipal business.

The Greenspace Master Plan proposes that the city:

a. Conduct many of its day-to-day municipal functions with a view to expanding the amount of greenspace in the city, increasing its quality, and enhancing residents' access to it;
b. Fulfill its responsibilities for land use planning and pursue its greenspace objectives through official plan policies and the zoning bylaw, and set targets for greenspace through plans for new and redeveloping communities;
c. Pursue, through the development review process, landscaping and open space features that support a high quality of urban design;
d. Contribute to greenspaces by incorporating pathways or providing natural habitat through projects such as stormwater management areas and other infrastructure;
e. Manage its own natural land wisely and evaluate whether surplus land has a greenspace contribution before releasing it for sale;
f. Partner with local communities to prepare management plans for natural areas, and also with the federal government and others to achieve common goals;
g. Commit to acquiring greenspace using established criteria and a public process, and explore alternatives to acquisition.

Greenspace Planning – A Way Forward

The city's requirements for greenspace and opportunities to provide it will continue to evolve as the city grows and changes. While greenspace planning will need to keep pace with that change, as a set of strategies and as a way of doing city business, the Greenspace Master Plan provides a way forward for the city to achieve its greenspace vision. Additional detail on the Greenspace Master Plan can be found at: www.ottawa.ca/city_services/planning/master_plans/gmp/summary_en.html.

Building Your Community's Greenspace Mapping in GIS

We used Geographic Information Systems (GIS) software to map the inventory of greenspaces and to identify those lands that would contribute to a Greenspace Network for the urban area of Ottawa.

While GIS improves mapping capabilities, there are some fundamental steps to take before jumping into computer-mapping; these include:

- identifying the kinds of lands that contribute to greenspace in your community;
- assessing the potential role or function they will play in an overall network of greenspaces; and
- determining the best tool to secure the greenspace contribution of those lands in the community.

Once you have identified the potential types of lands that contribute to greenspace and their roles, it is important to consult internally within your organization, externally with other agencies and with the public so that you can develop ways to identify these lands and include them in your inventory.

Building a GIS inventory of greenspaces in your community may seem a daunting task, but a significant amount of GIS data and mapping is already available through various sources. Here is brief list of the range of potential data sources that may be available for your project:

- Many municipalities are producing computer-based inventories of their lands including parks and stormwater management facilities;
- Conservation Authorities have inventories of their land holdings and, with local municipalities, have developed schematic mapping of environmentally sensitive lands such as steep slopes and flood plains;
- The Eastern Ontario Model Forest is developing a robust collection of data;
- Provincial ministries have mapping of provincially significant wetlands, Areas of Natural and Scientific Interest (ANSIs), as well as topographic mapping data;
- The Municipal Property Assessment Corporation has property assessment mapping. Lands that contribute to greenspace can be sorted based on property code and ownership.
- Geological Surveys of Canada has data of geophysical features that may be helpful
- Air photography is an excellent resource to review and evaluate data;
- Web-based mapping including Google Map often has a wide range of mapping data including air photography and various links to information on features and points of interest in your community;
- Many paper maps (e.g., tourism and trail maps) document greenspace resources in our region and can be used to enhance your inventory by locating properties that contribute to greenspace

In recent years there has been a near revolution in GIS software, with particular reference to amount, quality and accuracy of data. Still, a word of caution: while these data sets have improved greatly, they all have strengths and weaknesses and they must be checked against local knowledge and tested for accuracy. GIS is only a tool and a complex one at that. Starting with a strategic vision and clear understanding of what greenspace is are key steps to take before undertaking the GIS work.

Climate Change

CASE 1:
ACER SUCCESS STORY IN AN URBAN FOREST
— Joanne Healy

The heat island created in Toronto and the surrounding GTA, through development and pollution, is 4 degrees Celsius warmer than the rest of the province and is already stressing our urban forests. With global warming, changes in forest biodiversity in Ontario have the potential to move northward. The shift in forest biodiversity necessary to keep up with temperature changes, as well as resistance to pests and diseases this warmer climate brings, is not likely to occur at the same rate so loss of native biodiversity is imminent. While a warmer landscape can support greater biodiversity, many species expected to be successful in the future will be invasive exotic species – one more deadly notch on the trunk of our native trees.

ACER (the Association for Canadian Educational Resources) set out five years ago to collect scientific data in order to predict which tree species will survive and thrive under the conditions brought on by a new climate. What makes our project unique is the urban setting and the community involvement. The original tree plantings and all of the ongoing data collection on tree growth and health are done entirely by students and community volunteers. More than 3,000 students, from Grade 7 to Grade 12, have visited the site since 2002 and they have taken this experience back to the classroom and applied it to the fields of biology, geography, mathematics, science and technology, environmental studies and world issues.

Measured annually, the collected data is provided to students, scientists, national and international government agencies, foresters and the public. A copy of ACER's project report has been sent to the United Nations as a case study for a Community-Based Biodiversity Strategy. An objective of this case study was to demonstrate that communities can learn to plant trees that will survive to age 40+ and, with assistance, can pool their knowledge to choose the best species for the future. By transferring the required knowledge, communities can become proactive in ensuring the health of future urban forests by planting trees now, planning for the future and tracking these new trees over the next several years. Community involvement during this initial period is critical since trees that can survive the initial establishment period to start producing good growth have an increased likelihood to survive to maturity.

Volunteers are taught how to choose tree species and design urban forested areas in order to maximize biodiversity and ensure tree survival under current and future climate conditions. The project demonstrates that community efforts are the main driving force behind monitoring, measuring and planting for the future, at least in an urban environment. Our goal is to promote learning grounded in authentic community-based scientific monitoring and enable students and communities to participate as informed citizens in mitigating the causes and effects of climate change.

Using the natural environment as an integrating context for learning is a well-documented way to enhance new learner understanding as well as academic achievement and, perhaps more importantly, it offers a hands-on way for young people to feel connected to nature and feel empowered to do something in regards to climate change.

The one-hectare plot, created alongside the Humber River at Humber College in Toronto, follows standardized global protocol developed for monitoring climate change. The hectare is divided into 25 quadrats with each 20-metre square quadrat containing separate experiments with specific numbers and combination of 76 species. The 2,100 trees were planted in groups, tagged for identification and protected with brush blanket, mulch and tree collars. In addition to planting for biodiversity and climatic warming it also was designed to incorporate the four steps for disease resistance: not

"My students are eager to return to the ACER climate change plot now that they are aware it is a global warming experiment. Since their last visit to the field they have seen An Inconvenient Truth. They started an Environment Club, they are picking up recycling and telling kids not to litter." - Teacher

too many of one species; no more than 5 to 10 per cent of any one species; no more than 20 per cent of species in the same genus and no more than 30 per cent in the same family.

The use of a one-hectare plot gives a relatively large sample robust enough to capture the biodiversity of a forest site in the tropics as well as some of the most biologically diverse areas in the Carolinian Zone of southern Canada. The globally agreed upon protocol requires that all trees above a certain diameter (10 cm dbh in the tropics and 4 cm dbh in southern Canada) are mapped, identified for species and measured for diameter at breast height (dbh) and total height (m). Parameters such as tree health and understory vegetation are monitored in the plots.

We adapted the standard protocols for new forest plantings. This includes monitoring the performance of the trees and shrubs over seven years. It generally takes from five to seven years to determine whether a planted tree will survive and have the freedom it needs to put on good volume growth.

Some challenges we have overcome in a community-driven endeavor include coding the trees for planting by students and maintaining consistency of data entry over time with changing volunteer staff. Deterring wildlife from enjoying the young trees is another challenge. When we return to the plot this spring to measure we will assess the value of our first spraying of Plant Skydd, a non-toxic deer repellent.

Along with the collection of important data useful on a large scale we also measure success on the human level – from each child who squeals with delight and wonder at the discovery of a preying mantis attached to a tree collar, to the sense of adventure in the air as groups hike through the goldenrod and staghorn sumac in search of beaver homes on the river's edge. Repeat visits by teachers and students reinforce the belief that humans need to feel connected to the natural world to be grounded. Instead of feeling helpless about the state of decline of our world we can do something on a local level.

Situated in a valley beneath the Humber Arboretum, the plot is easily accessible for educational hikes starting from the arboretum's new Centre for Urban Ecology. This new facility provides a first-rate venue for education and research on urban ecology and an up-to-date example of environmental sustainability. One hundred hectares of green space with woodlands, ornamental gardens and several kilometers of paved walking trails surround the field. But looming in the skyline are condominiums and office buildings encroaching ever closer. The highrises are a constant reminder of the pressure nature faces and the good fortune we have in the GTA to have these pockets of green spaces – including the climate change plot – where data collected will help fight the decline of Ontario's urban forests and where future stewards of nature are inspired to lead the battle.

ACER (the Association for Canadian Educational Resources) is a charitable community education organization. Founded in 1987, ACER believes that sound ecological action depends on monitoring and responding at the community level. By drawing on the talents of leaders in education, media and business we are able to specialize in the development, production and promotion of Canadian materials to help meet the changing needs of today's learners.

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Climate Change Adaptation Options for Toronto's Urban Forest

Be sure to check out this latest climate change report from the Clean Air Partnership, which presents a compelling case of the urgency to reduce climate change impacts on urban trees. With input from City of Toronto staff, university researchers and tree advocates, the report presents a series of adaptation options to reduce the impacts of climate change on the urban forest. Topics covered include heat drought and stress, air pollution, changes in biodiversity, pest and disease outbreaks, flooding and erosion, and stress on parks and ravines.

The report stresses the importance of regarding the urban forest as infrastructure as vital as our roads, pipes and power lines, and outlines a series of recommendations on how the City of Toronto can begin to develop a comprehensive adaptation strategy for its urban forest. The report can be found online at www.cleanairpartnership.org.

- Ireen Wieditz

Lack of diversity

CASE 1:
THE OTTAWA FORESTS AND GREENSPACE ADVISORY COMMITTEE'S NATIVE TREE AND SHRUB DATABASE
— Iola Price

In Ottawa, it is possible to buy trees and shrubs that are invasive (such as Norway maple [*Acer platanoides*], common and glossy buckthorn [*Rhamnus cathartica* and *R. frangula*], Tatarian honeysuckle [*Lonicera tatarica*], Scots pine [*Pinus sylvestris*], and European birch [*Betula pendula*], among others). Most people are not aware that these, and other exotics, pose or may pose a threat to native biodiversity – threats that range from minimal to extreme.

Ottawa is blessed with many fine greenspaces but they, like native greenspaces around the world, are threatened with invasive species. Although the International Convention on Biological Diversity has text that commits governments to act to control the introduction and movement of exotic species, it is not easy at the municipal level, especially if exotics are already established in trade.

Worldwide, ordinary citizens together with professional ecologists, private and government agencies are increasingly promoting the restoration of native ecosystems and the removal of exotic invasives in attempts to retain or restore native plant biodiversity and to maintain the wildlife populations that depend on those plants.

The Ottawa Forests and Greenspace Advisory Committee (OFGAC) wanted to provide information to the public about the benefits of using native plants in gardens and other yard plantings and, at the same time, provide an annotated list or database that would give easy access to information about alternatives.

Starting with a list of native trees for street-tree planting adopted by the former Council of the Village of Rockcliffe Park, Sandra Garland of the Fletcher Wildlife Garden and I constructed a basic template (name, habitat requirements, size at maturity, water requirement, sun/shade tolerance, salt tolerance, etc.) and began the long but fun task of filling in the blanks.

We designed the template to provide the kind of practical information we thought people need when choosing a tree or shrub so that in 20 to 50 years, it has thrived in its environment and has provided a lifetime of enjoyment. For instance, if water shortage is an issue, then providing a "water needs" rating on a scale of 1 to 5 should be helpful. Or, if space is an issue, information on height and width at maturity is of prime concern.

For a residential or commercial lot in the urban or rural area, on which there are other trees, knowing plant associations is helpful. For instance, sugar maples grow in the wild in association with American beech (*Fagus grandifolia*) on rich organic soils, but would not necessarily do well on the thin and dry soil that Eastern redcedar (*Juniperus virginianus*) will tolerate. Considering the new tree's neighbours is always wise. Does the site have a lot of sun? If not, our database will point the person to trees and shrubs that are shade tolerant.

A challenge in filling in the blanks was to sort out often conflicting views on a tree's characteristics and habitat requirements and, for the numerical rating scales we devised, to decide whether a species warranted a 2, 3 or 4 for items such as salt tolerance, water requirement, etc.; the ones and the fives were easy! Another challenge was to pick one English, one French and one Latin (scientific) name for each species and then assign the many other common names to the Other Names category.

Why Use Native Species?

We recommend that people use native plant species because they are adapted to our climate and, through long association, are tolerant (to a large degree) of insect and fungal predators and diseases. Many of our beautiful butterflies and moths depend on specific native trees on which to lay their eggs because the caterpillar stage requires the leaves for food. The banded hairstreak butterfly needs oaks, butternut or hickory leaves as a food source; members of the birch family provide food for several other species of butterfly.

We recommend against the planting of exotic species because they can create biological problems. For instance, Norway maples cast a very heavy shade and, because they are such prolific seed producers, their seedlings have gained a competitive advantage over our sugar maple and, in some areas, have invaded and taken over whole forest ecosystems. They cast such intense shade that in some locations even spring ephemerals such as the white trillium (our provincial emblem) can no longer grow. Think of a Canada without its beloved national symbol and bereft of maple syrup! But, sometimes nature has a few surprises for the invader. Sugar maples have adapted over the centuries to survive tar spot, a North American fungus to which the Norway maples are not resistant. In 2005 and 2006, many

The Ferguson Forest Centre in Kemptville is a great source for native species of trees and shrubs that are hardy for the south central Ontario climate. See www.seedlingnursery.com for more information on species availability.

homeowners noticed large black spots on dead and dying maple leaves and so the leaf-raking season began in August instead of the usual September-November. Our advice was to replace the tree with a native sugar maple should the Norway maple die in the future.

Remaining Challenges

We have worked with City of Ottawa forestry staff to reduce the number of non-native species offered for planting on city streets. Norway maples, for instance, are no longer acceptable as street trees and city planning staff does not allow developers to plant that species in new subdivisions. The Ottawa Forests and Greenspace Advisory Committee reviews development proposals (new subdivisions) and we regularly comment to city planning staff on the use of non-native species in landscape plans. We have begun the construction of a table of alternatives – suggesting a native species alternative (tree or shrub) that matches the characteristics of the exotic species listed in the landscape plan. That way, if the developer proposes an exotic shrub with pink flowers, we can suggest a native species with pink flowers that we think will do just as well on the site; a five-metre high exotic tree that will do well in dry sites can be matched by a five-metre high native species that is dry-site loving.

One challenge is to have the landscape architect accept these alternatives and another is to find local and northern sources of the native species. Hackberry (*Celtis occidentalis*), for instance, has a form reminiscent of white elm (*Ulmus americana*) and it grows well in the wild in our area. But if the local nursery orders hackberry from southwestern Ontario or the United States, the long-term survival and well-being of a warm-adapted tree may not be good.

The database can be viewed and searched at www.ottawaforests.ca and, of course, we welcome comments on it. Can readers provide more information, correct any errors that might have crept in and tell us how they have used the database? Email us at: ofgac@ottawaforests.ca.

OFGAC Native Trees and Shrubs Database

Sort All Trees By: Common Name | French Name | Botanical Name | Water Requirement | Light Requirement | Salt Tolerance | Height or Search the database

Sugar Maple *Acer saccharum*	
Name, French:	Érable à sucre
Name, Other:	Hard Maple, Rock Maple, Érable franc, Érable franche
Natural Habitat:	Rich woods, rocky hillsides in association with American Beech, White Pine, Eastern Hemlock.
Tree Form:	Medium-sized to large tree, broad-spreading branches leading to a narrow, symmetrical, round-topped crown. Trunk sometimes heavily buttressed.
Size At Maturity:	Large tree 35 m high 115 feet
Light Requirement:	
Water Requirement: (scale of 1-5)	
Salt Tolerance:	Low
Wildlife:	Provides good nesting sites. Seeds, buds, sap and flowers are eaten by many species of birds.
Notes:	Our national symbol with colourful fall foliage. Flowers appear at same time as leaves. Moderate to fast growing. Shade tolerant but needs full sun for good landscape development. Does best in organic, well-drained slightly acidic soil but also tolerates poorer soils. Low to moderate pollution tolerance. Good in windbreaks, hedgerows, and woodlands but not where its deep, wide-spreading root s are restricted or in high heat sites. Good street tree if located where road salt, pollution and soil compaction are not major problems.
Available:	Yes

Example excerpt from: http://www.ofnc.ca/ofgac/

CASE 2:
NATURALIZATION EFFORTS AT AKWWSASNE: RESTORING OUR NATIVE, CULTURALLY-SIGNIFICANT SPECIES

— Margaret George

Several years ago, the Department of the Environment (a department of the Mohawk Council of Akwesasne) moved into a new building on Cornwall Island. As a staff group, we decided that we would try to naturalize the landscape around the building, focusing on restoring our culturally-significant plant species – this, in sharp contrast to creating a more manicured, grassed-over landscape.

We wanted to restore (and preserve) our natural heritage but also wanted to encourage our people to continue to use the plants that assist us in maintaining the good mind, body, and spirit the Creator gave us. Native wildflowers, fruit trees, shrubs and berry bushes were staples on our planting list. Tree species planted included apple, pear, plum and cherry, among others.

We recognized that naturalizing the landscape would improve the availability of food for various wildlife species, as well as provide cover, and nesting sites in the case of birds. The planting of wildflowers and native shrub and berry bushes would attract butterflies and hummingbirds, along with other bird species. Insects would be similarly attracted to the naturalized site, in turn attracting more birds.

In addition to acting as refuge for wildlife, the naturalized area would provide a place for nature studies and afford opportunities for teaching about fruit tree maintenance and related topics (medicinal plants, etc.). It would be a special place for our elders to sit and enjoy wildflowers, butterflies, trees and birds.

In all, more than 25 species were planted.

In a disheartening turn of events about a year after the naturalization project was launched, much of what we had planted was damaged by a careless act of weed-whacking which damaged the cambium on most of the fruit trees. Only a handful survived. Last fall many of our berry bushes met a similar fate – again the result of uninformed tending practice.

Now we will try to recover what was started. We've learned the hard way that it will require some special training and more effective communications to ensure that the naturalized area remains healthy and productive. Elsewhere at Akwesasne efforts are underway to re-establish native black ash (significant to the community as the primary species used in traditional basket making) as well as butternut (the health of which has been undermined by the canker that has wrought devastation across much of eastern North America). The community continues to view these efforts as critical.

The benefits to naturalizing your landscape with a variety of native trees, wildflowers, shrubs, and berry plants are many. A naturalized landscape will attract birds, butterflies, and other wildlife species. A naturalized landscape is much easier to grow and maintain. Native plants are hardier and more disease resistant, so you reduce the use of pesticides. In addition to reducing the use of pesticides and other environmentally-damaging chemicals, you save on energy costs, gasoline, and manpower.

Naturalizing our landscape is our responsibility as a people to our Mother Earth.

Contact:

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Mohawk Council of Akwesasne, Department of the Environment

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The Naturalized Knowledge System

The Naturalized Knowledge System (NKS) provides a useful structure for understanding the ingredients necessary to have productive partnerships. The NKS also serves as an analytical framework that can be used to examine what has worked well and what has not been so successful. The seven fundamentals of the NKS are:

⇒ The Earth is our mother.

⇒ Cooperation is the key to survival.

⇒ The spiritual world is close to us.

⇒ Responsibility is the best practice.

⇒ Knowledge is powerful only when shared.

⇒ Everything is connected to everything.

⇒ Place is important.

- F. Henry Lickers

Invasive Exotics

CASE 1: PARTNERSHIPS THE KEY TO SUCCESS IN ERADICATING ASIAN LONG-HORNED BEETLE IN TORONTO

— Richard Ubbens

At the end of the nineties, many municipalities were paying close attention to Asian long-horned beetle (ALHB) infestations in New York and Chicago. In Toronto, Urban Forestry, a branch of Parks, Forestry and Recreation, wrote a report to City Council outlining the serious nature of this pest, putting in place some of the framework that would be necessary to eradicate it – if and when it arrived. At that time, the Canadian Food Inspection Agency (CFIA) wanted to undertake a simulation exercise to see how things would work if ALHB was to be found in someone's jurisdiction. Toronto Forestry was a willing participant in this exercise. After completion of the exercise, it was clear that a model of having a Science team, a Communications team and an Operations team would be necessary and would help the CFIA work with stakeholders if and when needed.

With that exercise behind us, key Forestry Health Care Specialist staff in Toronto began to train the rest of the staff, including parks staff, on the signs indicative of ALHB infestation. We offered that training to private arboriculture firms operating in and around Toronto as well through the Commercial Arborist's Committee of the International Society of Arboriculture (ISA). Although many participated in the training, it was a member of the public who found and reported ALHB to the CFIA in September of 2003.

Many know the rest of the story in terms of how the CFIA, Toronto Forestry, the Canadian Forest Service, the Ontario Ministry of Natural Resources, Toronto Region Conservation Authority, Vaughan, York Region and others banded together to undertake eradication of ALHB. Keys to the success of the program were many; here are a few:

- ***Knowledgeable staff who knew the seriousness of this invasive pest*** – It was never a question that ALHB had to be eradicated. The method of eradication became the focus right away. For that, we had a team of experts from the Canadian Forest Service, the United States Department of Agriculture, the United States Forest Service, the Animal and Plant Health Inspection Service, Chicago, New York, the University of Toronto, the City of Toronto, and the CFIA who formed a science panel that would research questions that operations put to them.

- ***Advising City Council early on that ALHB would be our first priority, second only to emergency tree work*** – This allowed us to allocate some twenty-five per cent of our operation to the eradication effort right away. We were even able to focus on this during a municipal election because it was understood that time was of the essence.

- ***Initial data collection and delimitation survey was a first phase of work*** – This ensured that planned action was based on sound information.

- ***Building on partner strengths*** – Governments are not known to be able to ramp up quickly to meet emergency situations because budgets and purchasing regulations often restrict this. Both the CFIA and the City of Toronto worked hard to take advantage of the strengths each organization had to offer and, where one had a better system than another (for instance in hiring temporary staff, renting trucks or tendering contracts) the work was undertaken by the team with the best chance of quick success.

- ***Consistent and clear communications with the public*** – Many public meetings and meetings with media were undertaken with designated experts doing the presentations so that the message was consistent and clear.

- ***Teamwork and drawing on expertise as needed*** – Operations grew into many facets which included, among others, data gathering, surveys, tree removals, stump grinding operations, wood disposal and replanting. This complex organization was accomplished through staff banding together as one team with a clear organizational chart and reporting structure. Employing people with specific expertise, as and when it became needed, resulted in efficient and effective work.

- ***Trust*** – Eventually, service-level contracts were put in place; but, in order to accomplish the first and very important infested tree disposal program before spring of 2004, much of the work had to be undertaken on the expectation that each organization involved would undertake what it committed to doing without written contracts. There is a great degree of trust involved in undertaking work between government organizations when no legal documents are in place. Yet, the overriding goal was very clear: eradicate ALHB. Being focussed on that and knowing the importance of it, political support was clear and operational support did not waver.

- ***Evaluating progress and celebrating successes*** – We celebrated our successes along the way and analysed the trip hazards with an eye for improvement in each step of the program.

The methods employed, the science gathered, and the achievements realized have been widely communicated at symposiums, public meetings, and media briefings with government decision makers and peers around the world. Tackling a complex problem with a team of partnered, expert organizations—as well as sharing information and being open minded in working with others—has made Asian long-horned beetle eradication a success to date.

– Richard Ubbens, R.P.F.
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Mitigating environmental degradation in the broader settled landscape

CASE 1: APPLYING CITYgreen™ IN A CANADIAN CONTEXT— CITY OF OTTAWA

— David Miller

Recognizing the full range of benefits and values of forest cover is an important but challenging task for municipal policy makers. I have found that assessing forested areas based on special features or significant ecological values is well entrenched, if not always entirely successful, in planning and municipal policy and program development. Similarly, an exceptional or heritage tree in an urban setting often prompts public or private efforts at protection and maintenance.

However, as we are increasingly recognizing, the range of benefits for general forest cover and canopy go far beyond special features and ecological significance. Trees make a contribution to air quality improvement, water quality and storm water retention, general well-being and carbon sequestration, to mention a few. These contributions have both a value related to environmental quality as well as a monetary value. The monetary value generally reflects the cost of losing these contributions and having to compensate with constructed solutions such as storm ponds or increased health costs as a result of air quality concerns.

Having this broad range of values recognized on par with other considerations in planning and development requires both a way to emphasize or convey these values, and a way to incorporate those values into more systematic planning process such as the setting of broad targets, growth management strategies, and the assessment of development or re-development proposals.

Tools to provide this information and capability are just evolving. The City of Ottawa was approached by Tree Canada Foundation and American Forests to pilot a Canadian application of one such tool, CITYgreen™. CITYgreen™ is a GIS-based software package developed by American Forests designed to calculate the value of forest landscapes (including conversion to monetary values) for a number of attributes including air pollution, storm water retention and carbon sequestration. An application was also made to the Federation of Canadian Municipalities through the Green Municipal Fund program.

The Project

The project involves several tasks:

- Incorporation of available Ottawa data to replace American City defaults.
- Testing of the software on a small area to model a before and after development scenario.
- Testing of the software on a larger geographic area to establish baseline values city-wide.

To date, we have tested CITYgreen™ in a 150-hectare (ha) area within a green field development area in the east end of Ottawa.

Current conditions (land cover, soils, climate data) layers were entered into CITYgreen™ and current values for carbon sequestration, storm water retention, and air quality established.

After establishing baseline values, a preliminary concept plan was used to run a second scenario meant to represent a potential post-development scenario. Results were produced for three attributes – air pollutant removal, stormwater

Table 1: Changes in attributes.

Attribute	Before	After
Air Pollution Expressed as the value of the air pollution removed and kg/ year removed.	4680 kg/ year removed 24,257 (US$)	3115 kg/ year removed 16,125 (US$)
Carbon Storage	486,603 Tons	323,470 Tons
Carbon Sequestration	13,181 (Tons annually)	8,895 (Tons annually)
Stormwater Additional storage volume needed if all remaining tree cover removed. Sites with less tree cover will have a lower volume as the current run-off will be greater.	509,000 cu.ft	451,000 cu.ft
Stormwater Costs involved in replacing the natural storage of the permeable tree cover on the site - if all the trees were removed - with stormwater management ponds (including land costs)	$1.87 million	$1.66 million

retention, and carbon sequestration.

The tree canopy was reduced from 37 to 24.5 per cent (from 55 ha. of forest cover to 36 ha. of forest cover) which showed significant changes in several attributes or values (see Table 1).

We are now taking a critical look at these results and incorporating lessons learned into the next stage of the project. The next stage will continue to refine the application in Ottawa (metric values, more work on customizing the variable to reflect Ottawa conditions) and, through a contract with American Forests, apply the revised version to create a baseline for the urban and suburban area in the City of Ottawa.

Comments

Development and application of these kinds of tools is an evolving and challenging science (and, in some respects, art). This kind of assessment is not an exact science but, through research such as that being completed by the USDA Forest Service through the Urban Forest Effects Model (UFORE), and a number of projects in Canada (Oakville, Toronto and Calgary have all applied UFORE), sound scientific analysis is beginning to provide the methods and numbers to calculate the true value of urban forest cover. In Ottawa, one limitation is that we have not had the kind of research completed to entirely customize CITYgreen™ to reflect Ottawa conditions for values such as air pollution mitigation. More research on forest values would serve to enhance the precision and credibility of the analysis in Ottawa. The best of both worlds would involve the completion of a detailed assessment such as UFORE with a user-friendly, interactive software package such as CITYgreen™ which could complete scenario analysis and update baselines over time.

Eventually, a tool such as CITYgreen™ could be used in a number of ways including the setting of forest and tree canopy targets, the analysis of different community design options, the assessment of tree preservation plans for subdivisions, and as a tool to help determine values in tree compensation programs. It could also act as an important educational tool to ensure that, at some level, the full range of forest cover values will be recognized during municipal policy and program development and the planning and development process.

This project has been a joint effort of the City of Ottawa, Tree Canada Foundation, the Eastern Ontario Model Forest (who completed the initial small analysis), American Forests (who are completing the larger area baseline work and helping to modify the software), and the Federation of Canadian Municipalities (who provided funding through the FCM Green Funds program).

- David Miller, City of Ottawa
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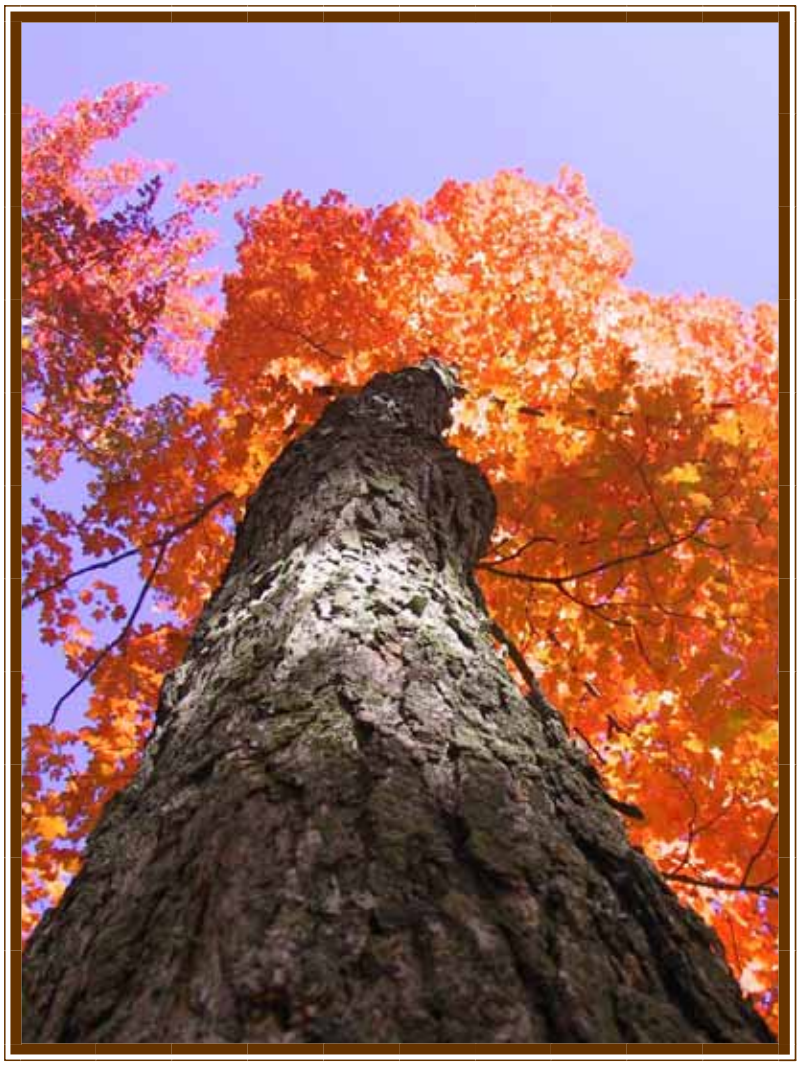

If you are thinking a year ahead, sow seeds. If you are thinking ten years ahead, plant a tree. If you are thinking one hundred years ahead, educate the people."

- Chinese proverb

Fragmentation

and net loss of woodlands and related natural heritage features

CASE 1:
A COMMUNITY ATLAS
— Don Ross

The amalgamation of municipalities across Ontario, in the late 1990s, meant that many Official Plans had to be opened and revised. Official Plans (OPs) are the guidelines for all forms of development and policy, and are in turn guided by the Provincial Policy Statement. As it happened, some OPs hadn't been revised for many years, even decades, and as a result were more often than not a little behind the times. This was especially the case for natural heritage areas of policy, where municipalities suddenly found themselves faced with having to account for significant woodlands, wetlands and wildlife corridors.

While drafting OPs is a daunting task in itself, the expectations for natural heritage are very difficult for municipalities to deal with: they simply don't have the expertise on staff or at their fingertips. At the same time, the integrity of the very high natural heritage values could be at risk here, including habitat for species at risk, the rich biodiversity, the quality of forest cover and even scenic values, if development was not intelligently guided.

The gap in information, to many in the conservation community, appeared as both a threat and an opportunity. Providing that natural heritage information could help municipalities over the long term to protect significant areas. Accordingly, and initially inspired by the Eastern Ontario Model Forest (EOMF) and the Canadian Parks and Wilderness Society (CPAWS), work began to identify significant woodlands, wetlands and wildlife corridors in eastern Ontario. As well, the project would develop a narrative that would explain the context and value of those heritage features, in language that municipal councilors and the public could readily understand.

An invitation went out to form a partnership to develop what would become known as a Community Atlas. The partnership became known as the Eastern Ontario Natural Heritage Working Group, and was made up of CPAWS, the EOMF, the Frontenac Arch Biosphere Reserve, Parks Canada, the Ontario Ministry of Natural Resources, municipal representatives and several others. The GIS work and evaluative processes were steered by the group, but the special expertise of the project came from Mark Rowsell of the Eastern Ontario Model Forest.

The Atlas, in both paper and electronic forms, featured the Greater Park Ecosystem of St. Lawrence Islands National Park. Rare and uncommon plants and animals were highlighted in the context of their habitat requirements. There were as well map illustrations of the Frontenac Arch, connecting the Algonquin to Adirondack regions, to explain connectivity. Those things set the stage for the real meat-and-potatoes of the Atlas, the mapping of significant woodlands, valuated wetlands and hypothetical connections between those features. The Atlas went into some detail of the process that derived the values for the woodlands and wetlands, and explained both the values and shortfalls of the mapping. In the end, the Community Atlas was seen as a very useful tool in understanding the natural heritage of this landscape, and helped not only in the official planning, but in many communications forums with the community at large.

The process and report are available online at:
www.woodlandvaluation.eomf.on.ca

(follow the links to the Eastern Ontario Natural Heritage Working Group download).

As soon as it was developed, the Community Atlas was delivered to several municipalities, with follow-up presentations for explanation. The exercise was in fact successful, with that very comprehensive material being a primary resource for planners in the Official Plan development. Indeed, there are still OPs being opened today, and the Atlas will continue to serve as a resource for planning and decision making. As well, the Community Atlas serves as inspiration for an even more comprehensive version that could come from continuing collaboration of partners from all areas of the community.

CASE 2:
INCORPORATION OF THE WOODLAND VALUATION SYSTEM INTO S,D&G'S OFFICIAL PLAN
— Michael Otis

Background Context:

One of the challenges facing municipal land use planners is developing schedules to be incorporated into municipal official plans (OPs) to delineate "significant forests" in the context of the Provincial Policy Statement (PPS). The PPS strongly encourages approval authorities and municipalities to protect "significant forests" through municipal OP's and decisions on development applications. At the same time, the definition of "significant forest" is very general in the PPS and there appears to be no standard methodology used by the Ontario Ministry of Natural Resources to delineate significant forests. It is basically up to each municipality to develop an appropriate methodology.

Specific Issue:

The County Official Plan is intended as a one-tier document that will serve as the OP for both the United Counties of Stormont, Dundas & Glengarry and its component Townships. The County Official Plan was approved by the Ontario Ministry of Municipal Affairs and Housing on August 14, 2006 after many years of preparation and several drafts. Several years ago, one of the major issues, if not stumbling blocks for Township acceptance of the OP, was the proposed areas shown as significant forests on the 6 Constraint Schedules. The Townships were concerned that the criteria used by the Official Plan consultants were too narrow and were based mostly on the size of the forests rather than an overall comprehensive analysis. It was clear that if the Townships were going to accept the proposed "significant forests", much more comprehensive analysis was required as well as direct input by Township staff.

Identifying Significant Woodlands: The Woodland Valuation System (WVS)

Municipalities have a responsibility to address significant woodlands in their Official Plans, however, unlike significant wetlands, woodlands of high ecological significance are not identified by the province of Ontario.

The Woodland Valuation System (WVS) is designed to flag woodlands that should be examined on the ground prior to making land use decisions. Under the WVS methodology, woodland features are given a relative value, or significance, based on several criteria including patch size, forest interior, proximity to other woodlands, proximity to water, slope, and islands.

The WVS was a collaborative effort among several organizations collectively known as the Eastern Ontario Natural Heritage Working Group. The scope of the project was limited to eastern Ontario, however, the WVS has been adapted in other parts of southern Ontario.

For more on the WVS see http://woodlandvaluation.eomf.on.ca.

The Response:

Staff from the Conservation Authorities had already assembled information regarding significant forests through various studies such as the Natural Heritage Study of the Raisin Region Conservation Authority and old growth forest inventories. Some of the Townships' planning staff had already undertaken their own inventory and analysis. We were also fortunate in that Mark Rowsell from the Eastern Ontario Model Forest volunteered his time and undertook an analysis of significant forests in the United Counties using existing information and the Woodland Valuation System (WVS) methodology. The result was an amalgamated schedule showing significant forests using a comprehensive data base and methodology. Township staff agreed with the new schedules and this removed a major obstacle to Township acceptance of the proposed County Official Plan.

Lessons Learned:

A coordinated, collaborative effort using staff and information from various agencies (e.g., the County, Conservation Authorities, Townships, Eastern Ontario Model Forest) produced positive results. Rather than base the analysis of significant forests on only a few criteria including size of the forest, it is much more beneficial to undertake a comprehensive analysis. Although the exercise has a happy result, it would have been very helpful had this type of analysis been done as a background study to the OP at the beginning of the process.

- Michael Otis, MES, MCIP, RPP, County Planner

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Mitigating human health issues caused by the urban environment

CASE 1: THE TORONTO DISTRICT SCHOOL BOARD: SETTING AN EXAMPLE FOR URBAN FOREST MANAGEMENT

— Adrina C. Ambrosii

In 1998, the City of Toronto amalgamated four municipalities and 2.4 million people. Consequently, the Toronto District School Board (TDSB) community developed, becoming the second largest landowner in Toronto, following Parks and Recreation, with over 2,000 hectares.

Currently, there are 300,000 students and 30,000 staff members who comprise the Board's community. The TDSB, embodying over 600 schools, is the largest school board in Canada and the fifth largest in North America (see Figure 1 below).

Some of the major issues and concerns that the TDSB faces include respiratory problems in children along with higher rates of skin cancer due to the absence of trees in active play areas (Children's Oncology Group 2004). Most trees belonging to the school board (especially the inner-city locations) have been planted in areas restricted to students such as the front of main buildings. According to the Canadian Dermatology Association, children have the highest risk for sun exposure as they spend between 10-25 per cent of their school day outside. Schoolgrounds generally have an expanse of asphalt and turf grass with little or no surrounding trees to offer protection from the elements. From kindergarten to grade eight over 250 days are spent outside during peak ultra violet radiation exposure times (Greater Kitchener Waterloo Chamber of Commerce 2004).

Benefits of schoolground trees not only reduce these health problems by shielding children from the sun, wind chill, city dust and pollution, but also aid in reducing energy costs and encouraging a sense of ownership that leads to stewardship.

After amalgamation, the TDSB was faced with a great challenge with respect to schoolground trees: they did not know the extent of their natural resource to effectively manage it. Recognizing their challenge, in 2004, the TDSB partnered with the Faculty of Forestry, University of Toronto, to develop a Tree Inventory Management Plan (http://www.forestry.utoronto.ca/pdfs/ambrosii.pdf).

There are two main aspects within this long-term plan; the strategy to collect an inventory along with a GIS manual that will allow the school board to continue the project, and; a GIS database consisting of maps linking with attribute data organized by school location codes.

The TDSB set out to establish a framework to measure the quantity and quality of their trees and to monitor changes over time. To accomplish this goal, they needed to:

- ✦ Identify and evaluate the benefits of trees on school properties
- ✦ Determine relevant data for collection
- ✦ Identify the tools and resources to collect, house and maintain the data
- ✦ Develop a cost-effective system for collecting the data to manage the their urban forest at the individual tree level

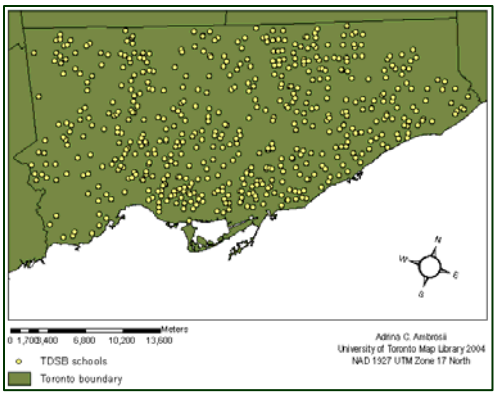

Figure 1: Toronto District School Board properties across amalgamated City of Toronto

The objectives of the stakeholders involved with this project include shade provision for students in the summer and windbreaks during the winter; elimination of potential hazards in playgrounds; energy savings; and lastly to be able to appeal for more funding based on concrete data (see Table 1 below).

Table 1: Objectives and deliverables of inventory stage.

Objectives	Deliverables
To create an up-to-date tree inventory for the 600 schools owned by the Toronto District School Board over a five-year period.	Develop a strategy and management plan illustrating the necessary steps for collecting attribute data for the trees.
To create a tree database using GIS and mapping that can be added to and/or altered in the future.	Create maps with waypoints ('x' & 'y' coordinates) for each tree illustrating distribution on each school ground.
To maintain constant communication between the TDSB grounds manager to ensure successful monitoring and inventory collection.	Document success and collect information regarding viable management techniques by keeping a log of daily activities.
Proper Tree Health Care – To avoid hazardous situations and monitor for risk assessment whereby analyzing liability laws and reporting potential hazards.	Develop a database where queries can be made by groundskeepers to search for individual trees that need immediate attention.

The deliverables of this project were as follows:

- documented procedures,
- a systematic protocol for data collection and georeferencing offered in the form of a Step-by-Step Manual,
- a final report including budget recommendations for subsequent years and,
- a functional system for implementation complete with an initial photograph library.

The first step was to determine the type of data and the tools for collection. A strategy was then developed to collect the attribute data and geographic information for each tree.

The attribute data was collected using the Neighbour*woods*© program, developed by Dr. Andy Kenney and Dr. Danijela Puric-Mladenovic, which provides a guided grading scheme based on condition criteria to evaluate each tree. This program is essential to managing trees at the individual level because it retains extensive details based on condition classes.

Trees are recorded using various coding based on species, location and conflict. And condition classes are categorized from 0-3 to minimize subjectivity on behalf of the evaluator. These classes are rated based on individual criteria for each condition, for example, a rating of 0 indicates that the tree is not suffering from that condition and a rating of 3 is the most severe. Diameter, height and crown width measurements were also recorded for each tree. Lastly, this attribute data is linked to the spatial database with an individually assigned tree identification number based on the location codes for each school building.

The GIS component consists of geo-referencing individual trees on each property using orthophotos and shapefiles of each site. The computer applications that were used were MapMaker and OziExplorer. Data was entered in the field directly onto a hand-held iPAQ computer. This data was then entered into a master database that was created using Microsoft Excel.

The above protocol that was implemented for the TDSB was the most cost-effective method even though there are many more advanced tools and technology. Since 2004, funding has been approved every year for students to collect inventory data. In order for the Board to meet their original objective, at the current pace of collection and budget, it will take another 5 years to complete the first round of the inventory. This will hopefully lead to stronger ties with the Faculty of Forestry since students have the opportunity for summer internships.

Currently, we have collected data for 160 schools and over 5000 trees. The tree inventory plan resulted in the acquisition of funding to implement a mulching program. Furthermore, the TDSB is moving towards developing a strategic urban forest management plan in the future.

The TDSB needs factual data concerning their trees when appealing for funds with respect to grounds maintenance. The tree inventory identifies what species are growing, evaluates their growing conditions and determines their potential for success.

This knowledge can be used to support a necessary environmental need that influences the health of our communities and their children. This will not only serve the interests of the Environmental Health Committee on children's wellbeing but aid in outdoor education in conjunction with the TDSB's EcoSchools initiatives (http://www.eco-schools.org).

The bottom line is that we need to take steps to ensure we're protecting our urban forest in all our communities, in all our cities. It is a necessary and beneficial resource. The TDSB is a model for school boards across the country; they are leading the way one step at a time.

— Adrina C. Ambrosii, B.A., MFC
www.adrina.ca

Lack of support/capacity for municipalities

CASE 1:
LIMERICK FOREST AND THE UNITED COUNTIES OF LEEDS & GRENVILLE
— Stew Hamill

Background

Limerick Forest was one of the many county agreement forests across Ontario: owned by the municipality, managed by the province for many years with little input from municipal representatives. This was a recipe for disaster when the province decided to end its direct involvement in management in the late 1990s.

The Grenville Land Stewardship Council saw the potential controversy coming: municipal councilors had no expertise in forestry or ecology; they had little appreciation for the uses and values of the forest, having had no previous involvement with its management. Would they propose a firesale of wood products to raise money? Would they decide to sell the land, just to reduce liability and responsibilities? Would they sign an agreement for management with a company that had little interest in the community?

Limerick Forest Advisory Committee (LFAC)

The solution devised by the Stewardship Council was a committee of concerned citizens to advise the municipal council. Originally spearheaded by the Stewardship Coordinator, the beauty of this group is that it welcomes all comers: anyone can join, attend meetings, and voice an opinion. The overall committee is divided into five subcommittees, based on particular interests (Administration, Ecology, Recreation, Education & Communications, and Forest Resources). From these subgroups, recommendations feed to a chairs committee which works on a consensus basis for approvals. Plans and recommendations are then forwarded to County Council for final approval and funding.

Successes

Since 2000, LFAC has operated to make recommendations and plan operations, but has also become a forum for discussion and an outlet for volunteer involvement. Volunteers carry out many of the Limerick Forest annual projects, with base funding from the County. LFAC's reputation with the County is such that a recommendation to hire staff was approved. Limerick Forest now has a fulltime forest manager and a technician on staff with the County, but with responsibilities to report to LFAC.

Another major success has been the drive to create an overall management plan: not just a plan for forestry operations, but a plan which includes recreation and education, and which puts ecosystems first. This plan is now, in 2007, under preparation; approval for its development was actually more difficult at the LFAC table than at the municipal one. County councilors had no problems with our request for $20,000 to hire a consultant to produce a management plan. This indicates the level of trust which has been developed for the volunteers on the committee.

Still in the Works

Our proposal for certification of Limerick Forest has been less successful and still needs work. We have not been able to explain adequately the need and justification for this qualification for the forest, although a new council is showing renewed interest in revisiting the issue. This just shows that even good ideas need to be properly prepared for discussion and approval.

Celebration and Enjoyment

Each year LFAC holds an Open House with a free barbecue to thank the volunteers and to invite the community into the forest. Presentations, awards, guided tours, and children's activities are part of the day. A monthly Open Doors event is held to introduce special features of the forest to participants, and to introduce the forest to community members.

Science and Good Forestry

Besides community involvement and advice to council, other benefits derived from LFAC activities include scientific research and monitoring: detailed studies have been undertaken to find and inventory old growth; scientific monitoring plots have been installed to document the impacts of plantation thinning and the potential threat from invasives. Our staff ensures that all forest operations follow the latest scientific recommendations and current regulations.

We are looking at ways to take more of a landscape approach as we manage our community forest: recent projects include searching for

"In the end, we conserve only what we love. We will love only what we understand. We will understand only what we are taught."
- Baba Dioum

grassland ecosites in the forest, and installation of loon nesting platforms in a lake. This approach can enhance and complement management activities, and help protect existing natural features.

Financial Considerations

The work of LFAC has put management of plantations back on track. This has not only created a revenue stream for the County, but has also assured that these unnatural ecosystems have a plan for the future. We have taken pains to explain to County Council that the forest is a tremendous ecological and recreational benefit to the community. As such, it should not be required to pay for itself in harvested products. Nevertheless, we do ensure that there is some revenue every year, to show that the forest has the potential to earn income. A current challenge is to decide whether and how users of the forest (trail users, hikers, hunters, bird watchers) should pay for their activities. The possibility of larger recreational developments (campgrounds, picnic areas) has also made its way onto the discussion table.

Education

A major educational success has been the adoption of a portion of Limerick Forest by a local high school. Students have carried out ecological studies, including the installation of monitoring plots. Construction and erection of outhouses by students is underway. Plans to promote the forest as a research site for university students have been less successful.

Recreation

Recreational activities and the potential conflicts among different users pose some of the biggest challenges for LFAC. Limerick Forest accommodates hunters and bird-watchers, snowmobilers and skiers, motorcyclists and hikers. Ongoing discussions, upgraded signage, and prohibition of activities in certain areas are some of the means we use to defuse potential problems and to promote healthy recreation. The construction of a boardwalk into a marsh was a significant development for walkers and nature lovers. To have it used as a hunting blind by insensitive hunters illustrates the potential for conflict.

Challenges

Even though the overall number of people interested in Limerick Forest is large, the pool of volunteers willing to work on LFAC is small. Recruitment is slow and difficult; burnout takes its toll on active members. The number of meetings required for discussion, preparation of plans, and development of recommendations is large. Certain issues cause dissension and emotions sometimes get out of control. Volunteer recognition is helpful, but maintaining a team of active, committed volunteers will be a continuing challenge.

The Future

With the development of the management plan, the need for direct involvement by LFAC members in management of the forest may decrease. We are currently discussing the future of the organization: Should we become a separate group which can fundraise? Should we become a "Friends of" entity with less responsibility for advising on management? Our structure gives us the ability to discuss and decide.

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Ecology Subcommittee Chair
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Advice for Others
1. Allow everyone to sit at the table and give input.
2. Provide structure and guidelines to manage that input.
3. Get buy-in from the forest owner in order to assure volunteers that their work won't be wasted.
4. Secure funding from the forest owner to show that they have bought-in and that they trust the advisory group.
5. Hire paid staff to maintain continuity of operations when volunteers disappear or quit, as well as to do the day-to-day and administrative operations which volunteers shouldn't do and shouldn't have to do.
6. Recognize and reward volunteers for their contributions.
7. Develop a management plan to which everyone contributes and which everyone accepts.

CASE 2:
URBAN FORESTRY: IS IT RELEVANT IN A SMALLER TOWN?

In June of 2005, the Ottawa Valley Section of the Canadian Institute of Forestry held its annual general meeting in Carleton Place, a community of almost 10,000, located 40 minutes from downtown Ottawa. The theme of the meeting was urban forestry. Urban forests in a town of 10,000? What is so urban about a town that you can drive through in 10 minutes? Well, the truth is that communities like Carleton Place (which are defined as *urban* by Statistics Canada) are, in reality, places of relatively high density where the management of trees under an urban forestry regime is most appropriate.

Why learn about urban forestry? Urban forests are often thought of as the "lungs of cities". They add values to individual properties, beautify streets and help to reduce the heat island effect of hard urban surfaces. Any area newly built looks pretty barren until trees have grown to a respectable size. But the importance of urban forests goes beyond the aesthetics of simply looking "pretty". And, while urban forests are important in their own right, they also help urban dwellers (80 per cent of the Canadian population) to understand the importance of other forests outside urban areas.

Research suggests that urban vegetation is helping to combat air pollution and is reducing building demands for power for heating and air conditioning. Furthermore, trees contribute to property values and feelings of psychological well-being. The habitat of many species at risk is in urban forests; Vancouver alone has 10, including the well-known spotted owl. Clearly there is a huge advantage to having a well-stocked, healthy and diverse urban forest from both a human health and wildlife point of view.

There is no question that the Canadian urban forest community has never been better organized to meet the urban forest challenge. More professional foresters and technicians are employed in urban forestry than ever before. Forestry legislation, such as Ontario's Bill 110, which licenses forestry professionals, defines and mentions urban forestry. Membership in the International Society of Arboriculture's Pacific Northwest, Prairie, Ontario, Québec and Maritimes chapters is at an all-time high. The Eastern Ontario Model Forest (within which more than a million people reside) has its Eastern Ontario Urban Forest Network. Tree Canada has moved its focus to urban forests. The Canadian Urban Forest Network has been created to better advocate and supply information for urban foresters. With consultation, the Network has articulated the Canadian Urban Forest Strategy. Finally, for the first time, "Urban Forests" appears as one of the strategic themes encompassed in the National Forest Strategy – the document which provides Canadians important benchmarks for achieving forest sustainability.

Unfortunately, though, urban forestry in Canada is still too often relegated to novelty status in which Canada's traditional players (forest industry, provincial and federal governments) assume the dominant role. At the national level, the level of urban forest research and of information gathering is very low. Unlike the United States whose Forest Service has a national network of urban forest researchers, specialists and programs (to the tune of about $35 million), Canada has no federal or provincial urban forestry programs (or positions).

There are, however, some signs that this may be (albeit slowly) changing as the general desire to engage Canadian communities has become mainstream policy. The industry (through the Forest Products Association of Canada) is targeting its messaging to the Canadian urban public, albeit with respect to the "traditional" forest, however, some of its member companies (such as Tembec) see value in greater community presence by supporting schoolyard greening projects. Consultancy in urban forest strategic planning, in tree bylaws and in inventory issues, is more in demand than ever. Some provincial governments (such as Manitoba through its Dutch elm disease control program) and the federal government are making some gestures about supporting, in a limited way, an urban forest program.

Most large urban centers have full time staff devoted to the health of forests and relatively large budgets. For example, in Toronto there are a number of different bodies; the Toronto and Region Conservation Authority dedicated to its river ravines, as well as the city's Parks and Recreation department and a separate unit for Urban Forestry Services.

Smaller centres such as Carleton Place, in which trees are just as important, have to make do with fewer resources, which take the form, by and large, of volunteers.

Connecting Communities: The Eastern Ontario Urban Forest Network

To assist smaller communities in eastern Ontario in maintaining and enhancing urban forests, the Eastern Ontario Model Forest established the Eastern Ontario Urban Forest Network (EOUFN). The EOUFN is a communications network intended to link community committees and practitioners with information that is pertinent to urban forestry. The network strives to facilitate the transfer of information (in the form of technical knowledge, policies, written materials, workshops, etc.) from the large cities with forestry staff to the smaller communities who depend largely on volunteers.

The EOUFN, established in 2001, continues to expand its reach in eastern Ontario and beyond. To become a member or to learn more about the EOUFN see http://www.eoufn.eomf.on.ca.

In the Town of Carleton Place, the town council recognizes "that vegetative cover is a vital component of the natural environment of the Town and that it must be protected, maintained and enhanced. . . [it] aids in the overall health of residents, provides a habitat for plant life and wildlife and adds to the scenic quality of the Town."

In order to give effect to this recognition, the town has set goals to:

- provide guidelines for proper planting and appropriate tree species;
- require a tree planting and conservation plan for all development including measures to protect existing trees and to consider what additional trees will be necessary at the completion of development;
- establish tree conservation practices on Town property and literature for private landowners;
- establish a program of tree planting and tree replacement;
- protect vegetative cover on all streams and the Mississippi River; and
- encourage the use of native species for all planting.

So how is this working in the small community setting?

In Carleton Place an Urban Forest Advisory Committee has been established as a committee of council. The committee is made up of volunteers of various backgrounds; the chair is a registered professional forester and a certified arborist, which helps to ensure that the technical messages about urban forestry are well-communicated with staff and council. One member of the committee is a councilor, and speaks for the committee when topics come up at council meetings. Small town Ontario simply cannot afford to have a forestry department and very seldom do small communities have staff trained in arboriculture or forestry. As with most small towns, Carleton Place depends heavily on its volunteers.

The committee—established almost ten years ago now—has met with some noteworthy successes:

- The committee has established a tree planting program for homeowners using native trees. Homeowners must participate in a workshop on proper planting and, more importantly, proper maintenance, before receiving a tree to plant at home. A tree costs the homeowner $15 and is subsidized by the town.
- Natural Environment Areas have been identified within the town and are now designated in the Official Plan.
- In the Official Plan it has been established that all developers must produce a tree conservation plan and a tree planting plan before permits are issued; these plans are approved by the committee.
- The committee recommends to town staff what trees should be removed, trimmed, and planted. All trees planted on public lands are to be native where the site permits.

Small communities have a strong interest in their local forests and trees and volunteers spend many hours working with municipal staff and council for the benefit of these urban treasures. Much of the information exists; it's a question of sharing it and making it more readily available to all – to ensure the health of our forests and our communities alike.

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Tony Bull
Ottawa Valley Section,
Canadian Institute of Forestry

Inspiring and motivating

community involvement

in urban forestry efforts

CASE 1:

COUNT YOURSELF IN AS A "NATIONAL TREE PLANTING CHALLENGE" CHALLENGER!

— Craig Huff

In early May the City of Ottawa announced the National Tree Planting Challenge, inviting municipalities from across Canada to join the city in contributing towards the United Nations Environment Program's "Plant for the Planet - Plant a Billion Trees" campaign.

groups, schools, businesses, corporations, and citizens of all ages in leaving a vital legacy for the future of our city. We believe that the joining together of Canadian municipalities will also contribute to the planting of millions of trees across the country. In doing so, the National Tree Planting Challenge has the prospect of building strong public awareness of the issues of local governments in our struggle to maintain the environmental integrity of our communities while providing a venue for promoting simple actions and individual commitments to environmentally-based activities.

As the host of the National Tree Planting Challenge, Ottawa agrees to tally and track the commitments of participating municipalities, develop a communication network to share interesting planting projects between municipalities and with the media, and keep UNEP's Plant a Billion Trees campaign informed of our communal progress.

We invite you to sign on with Ottawa, plant trees and count your municipality in as a participant in the National Tree Planting Challenge. All we need is a contact name and number from your organization. Please contact Tracey Schwets at (613) 580-2424 ext. 43202 or *Tracey.Schwets@ottawa.ca*.

Encourage your elected representatives to accept this Challenge! It is through partnerships such as this one that we can continue to guarantee a healthy urban forest for future generations.

For your municipality, it is simply a matter of signing on to UNEP's website http://www.unep.org/billiontreecampaign and recording the number of trees your municipality is planning to plant over the next few years.

Ottawa's commitment to the campaign is 100,000 trees, which are to be planted over the next four years through Council's Trees, Reforestation and Environmental Enhancement (TREE) program.

Ottawa views this program as a source of inspiration and motivation to build local opportunities for partnerships with community

— Craig Huff, R.P.F.
City Forester, City of Ottawa
Craig.Huff@ottawa.ca

- EPILOGUE -

FUTURE CHALLENGES AND OPPORTUNITIES

— Sandra S. Lawn

Governments seem to favour working in nicely organized silos rather than face the reality of "everything being connected to everything" as encompassed in the Naturalized Knowledge System (see page 12). Scientists also seem to prefer their own disciplinary silos.

However when we examine the decisions that thoughtful local governments must make every day we see the importance of natural and physical science, well expressed in plain language, and readily available to modern policy makers who are out there "on the ground".

This publication is part of a concerted effort to bring essential current science to community decision makers. We have begun with a series of case studies related to the urban forest – a matter connected to health, property values, air quality, ground water quality and quantity, energy and much more.

There are many forestry and natural science-based issues that must be addressed in future volumes of this "Community Experiences" series. Some of these include:

- air quality
- biodiversity
- climate change/carbon credits
- community economic development
- emergency planning
- energy; production, conservation
- environmental sensitivity
- fire protection
- flood plains
- fragmentation/connectivity
- ground water protection/ recharge areas
- health/medical epidemiology
- heritage and tourism sites, trails, waterways
- Land management, official plans/zoning by-laws
- nutrient management
- parks/quality of life
- waste management

It is a rare municipality that would have easy access to interdisciplinary teams from the disciplines of:

- biology
- chemistry
- climatology/meteorology
- ecology
- economics
- engineering
- epidemiology
- forestry
- geography
- hydrogeology
- medicine
- pedology
- physics
- statistics

But decisions are made every day that are based on these disciplines. Your ideas on what would be most helpful for your future decision-making can be forwarded to the Eastern Ontario Model Forest:

modelforest@eomf.on.ca

(613) 258-8241

RESOURCES: A STARTER LIST

This list is intended as a helpful starting point for seeking out resources and more information pertinent to urban forestry and related topics in the context of the Great Lakes-St. Lawrence forest region. It is by no means exhaustive.

Websites

- Association for Canadian Educational Resources - www.acer-acre.org
- Canadian Institute of Forestry - www.cif-ifc.org
- CANUFNET (Canadian Urban Forest Network) electronic mailing list - http://list.web.ca/lists/listinfo/canufnet
- CITYgreen™ - http://www.americanforests.org/productsandpubs/citygreen/
- Conservation Ontario - www.conservation-ontario.on.ca
- Eastern Ontario Model Forest - www.eomf.on.ca
- Eastern Ontario Urban Forest Network - http://www.eoufn.eomf.on.ca
- Ferguson Forest Centre - www.seedlingnursery.com
- Mohawk Council of Akwesasne, Department of the Environment - http://www.akwesasne.ca/Environment.html
- Ontario Ministry of Natural Resources - www.mnr.gov.on.ca
- Ontario Stewardship - www.ontariostewardship.org
- Ottawa Forests and Greenspace Advisory Committee - www.ottawaforests.ca
- State of Eastern Ontario's Forests - www.sof.eomf.on.ca
- Toronto District School Board's EcoSchools initiatives - http://www.eco-schools.org
- Tree Canada Foundation - www.treecanada.ca
- Trees Ontario Foundation - www.treesontario.on.ca
- United Nations Environment Program "Plant for the Planet - Plant a Billion Trees" campaign - http://www.unep.org/billiontreecampaign
- Urban Forest Effects Model (UFORE) - http://www.ufore.org/
- Woodland Valuation System - www.woodlandvaluation.eomf.on.ca

Publications

- *Choosing the Right Tree: A Landowner's Guide to Putting Down Roots* - www.eomf.on.ca
- *Climate Change Adaptation Options for Toronto's Urban Forest* - www.cleanairpartnership.org
- *Compendium of Best Management Practices for Canadian Urban Forests* - http://www.treecanada.ca/programs/urbanforestry/cufn/resources_bmp.html#_Toc126753312
- *Signs and Symptoms of Asian Longhorned Beetle Injury - Training Guide* (copies available from Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre)
- *Exotic Forest Insect Guidebook* - www.inspection.gc.ca
- Extension Notes Index - http://www.lrconline.com/Extension_Notes_English/index.html
- *Greenspace Master Plan: Strategies for Ottawa's Urban Greenspaces* - www.ottawa.ca/city_services/planning/master_plans/gmp/summary_en.html
- Toronto District School Board Tree Inventory Management Plan - http://www.forestry.utoronto.ca/pdfs/ambrosii.pdf
- *Trees of Akwesasne* (copies available from the Eastern Ontario Model Forest) - www.eomf.on.ca

Events

Forest Fair of Eastern Ontario (yearly in September) - www.eomf.on.ca

Forest Pest Management Forum (yearly in December) - http://cfs.nrcan.gc.ca/subsite/pest-forum

Ontario East Municipal Conference (yearly in September) - www.oemc.ca

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Our vision of forests for seven generations is a mosaic of healthy forest ecosystems within a landscape of rural and urban areas throughout eastern Ontario, providing long-term economic, social, and spiritual benefits, while ensuring a healthy environment that is valued by all.

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