

SUSTAINABLE DEVELOPMENT IN THE URBAN FOREST¹

by John McNeil

Abstract. A major threat to natural green spaces is urban development. An urban forestry strategy is required in order to incorporate the best parts of this natural green space into the urban fabric on a sustainable basis. Current issues and a strategy that has been successfully implemented at the Town of Oakville are described.

Résumé. La menace majeure aux espaces verts naturels est le développement urbain. Une stratégie en foresterie urbaine est requise afin d'intégrer les plus belles portions de cet espace vert naturel au tissu urbain sur une base soutenue. Des résultats courants et une stratégie qui a été implantée avec succès au sein de la ville d'Oakville sont décrits.

Communities in Southern Ontario have just experienced a tremendous land development boom. Municipalities have actively expanded their urbanized areas to accommodate new construction. As a consequence, vast areas of natural green space (woodlands, wetlands, meadows, ravines) have been destroyed. In order to sustain a balance between this trade-off, an urban forestry strategy is required to guide municipalities' planning and development actions.

The purpose of this paper is to describe such a strategy. It is one that has worked well for the Town of Oakville over the last decade. Four major areas will be addressed: 1) the complexity of natural green space, 2) the importance of integrating natural green space into the urban network 3) the major threats to natural green space, 4) a suggested urban forestry strategy.

The Complexity of Natural Green Space

Oakville is located about 50 km west of Toronto on the shoreline of Lake Ontario. It is an actively growing community of approximately 100,000 people, almost 40 percent of the land base is urbanized. A rich biological and physical environment is present (4). As a reflection of this, the Town's Official Plan recognizes five environmental land use designations. Type one is *Environmental Protection Areas*. These areas consist of major creeks and ravines. They are identified by provincial government hazard land mapping studies.

Type two is *Environmental Policy 'A' Areas*. These areas are high quality, usually well-drained, upland woodlands. Type three is *Environmental Policy 'B' Areas*. These areas are made up of poorer quality woodlands often on poorly drained, lowland areas. Both types are identified by urban forestry staff. (In some cases, depending on the distinctiveness of creek lands, these areas are also included in Types 'A' and 'B'). Soil drainage is a reliable indicator of a woodlot's ability to survive urban development. Generally, type 'A' woodlots are better able than 'B' woodlots to adapt to the inevitable water table changes that result from new subdivision engineering. Type four is *Regional Environmental Sensitive Areas*. These areas consist of significant biological features identified by both regional and provincial government studies. An example is the Ontario Ministry of Natural Resources' Area of Natural and Scientific Interest program. Finally, type five is *Shoreline Protection Areas*. These areas are mapped by local conservation authorities. It is important to note the variety of agencies which contribute to the development of this list.

Integrating into the Urban Network

Except for *Shoreline Protection Areas*, once any environmental land use designation is acquired by the Town, it becomes a *Natural Woodland* park. Acquisition is primarily through parkland dedication by the developer as required by provincial law. In addition, a Town policy requires a minimum setback of 7.5 meters along major ravines, over and above the parkland dedication. This is required for environmental protection and conservation management purposes.

It is up to individual municipalities to determine how the parkland dedication will be used. Oakville has made a commitment to optimize the amount of natural green space preserved through this process. More than 50 percent of the Town's 600 hectare park system is comprised of woodlands and ravines. Therefore, based on representation alone, natural green spaces are important to

1. Presented at the annual conference of the International Society of Arboriculture in Toronto, Ontario in August 1990.

Oakville; they make up over one-half of the parks' system.

The wealth of green space provides opportunities for low intensive, passive recreation. An 80 km self-guided trail system links the majority of natural woodland parks, creating a green network. This is a popular and low cost public service.

Green space serves as the site for flood control and watershed conservation projects. In the Glen Abbey community an extensive system of storm water detention ponds successfully doubles as recreational facilities such as playing fields and trails. In addition, the Town heavily naturalizes these areas with native wetland vegetation (Figure 1). Natural green spaces are definite assets to the Town's park system.

Threats to Natural Green Space

Redevelopment, primary development, encroachments on existing natural woodland parks and the weaknesses of existing tree protection legislation, are four of the main threats. These last two items are 'hidden threats' to natural green space protection. The policies and procedures in place in Oakville are optimum given the existing provincial legislation. However, the weaknesses in the Trees Act, R.S.O. 1980, for example, are well documented (3). Municipalities too often stop short in their protection practices. The mistaken belief is that "the trees will take care of themselves" once a woodlot is identified for protection. In some cases, naturalization projects have had to be incorporated (some years later) to bring back the natural regeneration (1). A woodlot management plan should be implemented to avoid these crises.

Oakville was forced to take a serious look at fencing all parkland when it became apparent that there were critical problems of encroachment around the perimeter of natural woodland parks. In 1983, a complete inventory of all natural parkland found that encroachments were occurring in over 90 percent of the lots bordering natural areas (6). These ranged from dumping to outright annexation of parkland. Wherever there was a private gate, there was a new trail running into the woodlot. This compacts soil and destroys regeneration. Uncontrolled access led to unauthorized landscaped areas, vandalism, gar-

bage dumping and altering of drainage. In most cases, the encroachment was not a deliberate attempt to destroy the natural environment but resulted from a lack of awareness about how fragile the natural areas are.

Redevelopment, often at higher densities, can be a serious problem. In this region, many former lakefront estates have been converted into subdivisions. This raises the question of vegetation preservation, shoreline conservation and public parkland access. Primary development is a major issue. Techniques to effectively incorporate natural green spaces into new subdivisions are presented in the next section.

An Urban Forestry Strategy

In Oakville, the main reason for a successful natural green space program is Town Council's commitment to the program. Council is aware of the broad base of support in the community for the program and exhibits a willingness to uphold the environmental policies and procedures.

The first step in protection is a municipal green space resource inventory. Within the Town limits there are about 150 woodlots; all of them have been inventoried in the field, as have the main creeks and ravines (Figure 2). All are then classified as described in Section One. The complete list is documented in the Town's Official Plan which also contains a set of environmental policies (5).

To be effective, these policies must be implemented in a co-ordinated fashion by a wide cross-section of staff professionals: urban



Figure 1. Storm water detention pond with naturalized plantings and trails.

foresters, arborists, landscape architects, planners, biologists and engineers. The co-ordination is made more difficult because these individuals report to different department directors and different agencies. One key relationship is between the Parks and Recreation and Planning Departments. It is critical that the urban forester and planner address common concerns at the earliest stage in the planning process. Key woodlots (identified in the Official Plan) and proposed green linkages should be incorporated into secondary plans. At the same time, discussions with Public Works engineers should be held about the broad watershed drainage issues because stormwater management has fundamental implications for green space preservation. This stage is independent of, and prior to, individual development applications. The process is one of continual fine-tuning since these applications will initiate a more detailed review if key green spaces are involved. The green space contained in the final subdivision design should help meet a clearly defined departmental environmental goal. It should contribute to an overall master strategy to link these green spaces. It must be practical.

The municipality is not likely to obtain the entire woodlot (or other green space) through parkland dedication. Therefore, consideration must be given to maintaining the existing forest edge. Woodlot edges are important for buffering and screening, woodlot stability, wildlife habitat and aesthetics (2). A good edge provides protection to the woodlot. An environmental policy used to accomplish this is a top-of-bank setback described earlier.

One of the conditions of approval contained in subdivision agreements is that a detailed tree inventory be completed by the developer. It shows the existing and proposed grades at the base of all trees to be preserved. This is effective for assessing trees that are located in proposed building lots. For trees in significant green spaces, this inventory, instead, breaks the woodlot down into homogeneous compartments: areas of similar soils, drainage, tree species, age and health. This helps to determine the most practical part of the woodlot to incorporate into the draft plan of subdivision. The inventory must be considered with reference to the proposed engineering services,

grading and stormwater management plans. Modifications to these engineering plans must be negotiated during draft plan stage.

A case study will help illustrate my points. An environmental study was conducted for a 22.5 hectare subdivision. Most of the area was wooded with two well-defined creeks passing through. The study revealed that the most practical part of the woodlot to preserve was an upland oak, maple, pine compartment. This area along with all hazard land and the top-of-bank setbacks was superimposed on the draft plan of the subdivision. The configuration of the building lots, housing density, road layout and engineering services were modified by the planner, in consultation with Parks and Recreation staff (Figure 3).

Now the plan becomes registered and the

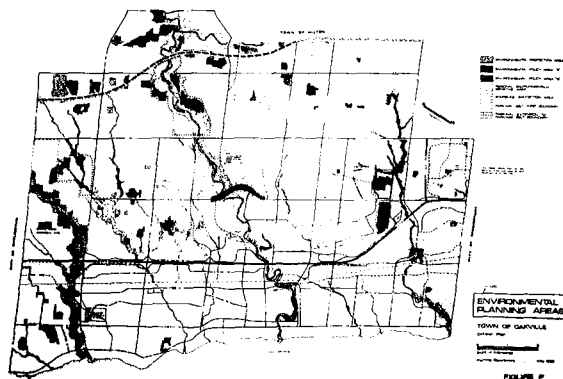


Figure 2. Environmental planning areas as presented in the town's official plan.

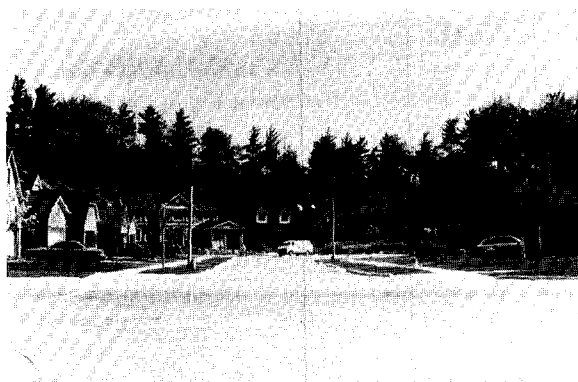


Figure 3. Urban woodlot successfully incorporated into urbanized area.



Figure 4. A 7.5 meter setback between the ravine top-of-bank and residential rear lot line.

builder applies for building permits. The municipality must apply strict management techniques at this stage. In Oakville, no building permits are released until the permanent, 1.2 meter high chain link fence is installed by the developer around all parkland. Fencing is an essential management tool to protect the natural woodland park. Formal park entrances ensure equal access to the trail system for all residents.

The trail system is another management tool. It is located on the top-of-bank setback (between the ravine and the rear of residential lots) (Figure 4). It must be laid out to allow the user to see the best part of the woods without leaving the trail. Trails are constructed with a limestone screening base and are 2.4 meters wide. They are used during all four seasons of the year. Trail guide pamphlets help build awareness and a sense of stewardship for the woodland park. One example is Iroquois Shoreline Woods. At 35 hectares, it is

the largest tableland woodlot in the parks system of the Town of Oakville. It offers an opportunity to walk up to three kilometers in a looped trail system while viewing plants and wildlife. One station describes the forest management project underway to regenerate the oak woodlot by creating openings in the tree canopy.

In conclusion, building public awareness and following a set of practical environmental policies are key components of an urban forestry strategy. Adopting such a strategy can help municipalities achieve a sustainable development objective.

Acknowledgements. I wish to recognize the work of Bob Perkins and John Ghent, Town of Oakville, in developing many of the programs contained in this urban forestry strategy.

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