

Governance and Urban Forests in Canada: Roles of Non-Government Organisations

Abstract

Among other themes within urban forest governance, our team is investigating how non-government organisations (NGOs) play pivotal roles in the management of urban forests in several Canadian cities. We believe that NGOs are crucial players in assisting municipal administrations to engage the citizenry, most notably in education and stewardship programming and implementation. After providing a context for urban forest governance as we understand it in the Canadian context, we present and analyse three cases of NGO influence on the management of urban forests: (a) LEAF in Toronto, Ontario; (b) Clean Nova Scotia in Halifax Regional Municipality, Nova Scotia; and (c) Dalhousie University, also in Halifax. We conclude that NGOs are potentially necessary and highly desirable elements of an effective urban forest governance system. Cities and towns that lack NGO interest and capacity in urban forest governance and management would do well to encourage NGO establishment as well as the uptake of the urban forest development agenda.

Introduction

The sustainability of urban forests is gradually capturing more attention from a range of interested parties in Canada. This may in part be because more than 80% of Canadians live and work in urban settings. Cities are preparing their first ever urban forest management plans (e.g., HRM Urban Forest Planning Team, 2013; Ordóñez and Duinker, 2013), urban forests are in the news because of insect infestations and ice storms (e.g., Toronto) and NGOs in some cities are ramping up their activities related to urban forest stewardship. Interest from the provincial and federal levels of government is difficult to gauge, but at least the Government of Canada is seeing the value of getting better information on the state of Canada's urban forests (e.g., Pedlar *et al.*, 2013).

The range of challenges to improving urban forests in Canada is broad. Many of the challenges are biophysical; these include things like appropriate soil volumes for street trees and the right species choices in the face of invasive alien pest species and climate change (Rostami, 2011). Many are also economic, such as how improvements to urban forests can be paid for when they generate essentially no direct revenue. There are also socio-political challenges, such as the aspects of urban forests that people deem important (Peckham *et al.*, 2013), and how the urban forest should be governed to perpetuate those values (Ordóñez, 2014).

A necessary ingredient of sustainable urban forest management is governance (Lawrence *et al.*, 2013). Governance is the prevailing contemporary concept of decision-making, because governments are no longer the only important actors in the management and policy scene. In our experience, a strengthening role is being played in urban forest governance by NGOs. We are interested in this evolution because we suspect that the rate of advance in urban forest sustainability may well be directly related to the influence of NGOs dedicated to this cause. Our involvement in the preparation of Halifax Regional Municipality's (HRM; hereafter shortened to Halifax) Urban Forest Master Plan (HRM Urban Forest Planning Team, 2013)

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drew us into several enquiries about how NGOs function in sustainable urban forest management in other cities across North America. These enquiries made it evident that the absence of identifiable urban forest NGOs in Halifax was an impediment to effective and efficient progress in implementing some of the key actions identified in the Plan as being critical to sustaining Halifax's urban forest.

Our purpose with this paper is therefore to better understand how NGOs carry out their urban forest work, and how they thus become influential actors in urban forest governance. We begin with a short overview of urban forest governance in Canada, and then present three vignettes describing NGOs doing significant work to sustain urban forests in two Canadian cities – Toronto and Halifax. We finish with some general statements about the role of NGOs in sustainable urban forest management, and reflect on a research agenda that could guide enquiry and reduce key uncertainties about NGOs and urban forest governance.

Background on Urban Forest Governance in Canada

Trends in Forest Sector Governance

Like Lawrence *et al.* (2013), we take as a starting point the conception of governance advanced by Tacconi (2011) for application to natural resources and the environment:

The formal and informal institutions, rules, mechanisms, and processes of collective decision-making that enable stakeholders to influence and coordinate their interdependent needs and interests and their interactions with the environment at the relevant scales.

Stripped to its essentials, we can see governance as addressing questions related to who makes which decisions about what, and how (Hoberg, pers. comm., 2008). In a Canadian context, policy setting in the forest sector has long been a rather closed process involving three groups of organisations: senior government, industrial firms and university faculties of forestry. Despite observations that evidence of change in that situation is scarce (Howlett and Rayner, 1995; Howlett *et al.*, 2009), Duinker (1998) claimed that, during the 1990s, the forest sector in Canada made strong progress in broadening

the management and policy dialogues to include various elements of civil society. The advent of forest certification processes may well exemplify the strongest shift in forest sector governance (at least for the timber-producing portion of that sector), signalling a steady progression toward various forms of network governance (Jones *et al.*, 1997).

Main Actors and their Roles in Urban Forest Affairs

To set a context within which we can understand the roles of NGOs in relation to the urban forest, let us explore the identity and roles of the main actors associated with urban forests in Canada. In other words, who are the players and what do they do? We begin with governments. Local governments, or municipal governments, are without doubt the principal agents of urban forest management (Konijnendijk *et al.*, 2006). On municipal land, especially along streets, they plant and maintain large numbers of trees. They can also regulate – some strongly, some weakly – the fate of trees on private land, both during urban-infrastructure development and in established neighbourhoods. They mount a variety of programmes to educate and encourage their citizens about tree stewardship. These are the three main priorities guiding action under one of Canada's latest urban forest master plans, that of Halifax (HRM Urban Forest Planning Team, 2013). In short, one expects urban forest management to be handled largely by the municipality.

The Government of Canada's interests in urban forests are most evident in relation to (a) invasive alien species (e.g., brown spruce long-horned beetle (*Tetropium fuscum*) in Nova Scotia and emerald ash borer (*Agilus planipennis*) in Ontario) that are under the purview of the Canadian Food Inspection Agency; and (b) land ownership, i.e., federal Crown properties within towns and cities upon which trees may grow, such as military bases, government administration facilities, national historic sites and experimental farms. The federal government may also contribute with money and assistance during disasters such as Hurricane Juan, which hit Halifax in late September 2003. Most of the help needed in the city was the removal of downed woody debris.

Provincial governments vary in their roles in urban forests within their respective jurisdictions. Like the federal government, provincial governments

often own substantial tracts of urban land, so they are responsible for the trees on that land. Because municipal governments in Canada are legitimised by the authority of the provincial governments, the latter can set the rules by which the municipal governments regulate trees on private land. In Ontario, for instance, the Municipal Act of 2001 is the current home for provisions allowing municipalities in that province to establish by-laws pertaining to tree cutting on private land. Some provinces have a strong regulatory function in relation to forest and tree health. Probably the strongest such legislation is the Manitoba Forest Health Protection Act, a recently proclaimed statute that supersedes the repealed Dutch Elm Disease Act. In Winnipeg, a city graced with a huge population of elms (mainly *Ulmus americana*), control of the disease in city trees is directed by provincial regulation. Finally, provinces too may provide funds and other assistance in times of weather disasters such as hurricanes and ice storms.

Businesses are prominent players in the urban forests of Canada. Tree species choices for urban plantings are often restricted to what is grown in private nurseries (only a few cities, like Saskatoon, have their own nurseries). Developers who put up new buildings in already built-up areas and create housing sub-divisions on wooded or agricultural land have immense control over what original vegetation is kept on the site and the nature of new planting in the disturbed areas (e.g., lawns, parking lots). Businesses own huge amounts of property in Canadian cities, and they are therefore in the same position as all other landowners in being responsible for tree cover on their properties. It is safe to say that some of the lowest rates of canopy cover in Canadian cities, apart from downtown areas full of high-rise buildings, are business parks. Excluding undeveloped woodlands, we recently estimated the tree density in Burnside Industrial Park (Halifax) to be a paltry 55 trees per hectare (Walsh, 2012). Finally, there are businesses offering tree services, and their practices are largely driven by professional arboricultural standards. In many cities, tree maintenance associated with overhead electrical cables is in the purview of the electric utility company, which in some cases is private (e.g., Nova Scotia Power Inc. in Halifax).

Individual citizens have at least four major roles in urban forest development. They too are landowners who influence directly the tree canopy on their lots. They are voters who can help install tree-friendly

councillors in city administrations. They can advocate for (or against) urban forest programming. Finally, they can participate as volunteers in tree-related programmes, particularly planting.

Finally, we identify NGOs as potentially key players in urban forest governance and programmes. NGOs can, and do, advocate for urban forest improvements; educate citizens about city trees and their management; implement research that points to opportunities for urban forest improvements; demonstrate urban forest stewardship on their own land; organise and facilitate citizen-engagement and citizen-stewardship programmes; and bring philanthropic and other funds to the enterprise of urban forest management.

Complexity in Urban Forest Governance

In Canada, the predominant conception of the urban forest is that it includes all of the trees in a city, along with the associated biota and abiotic environmental elements, so that the urban forest is indeed seen as an ecosystem. Under that conception, urban forest governance becomes rather complex because of the fragmented ownership of tree-dominated ecosystems and the range of actors influencing the full range of the tree canopy in a city. Adding to the fragmentation is the possibility that urban forest plans are developed by the planning arm of the municipal government, whereas their implementation is the responsibility of the operations division.

In the framework of Lawrence *et al.* (2013, Table 2), researchers are prompted to develop a detailed narrative guided by a long list (17) of substantive themes. If we apply this framework to a specific urban woodland, such as a wooded city park, or to an agency, such as a specific urban forest municipal authority, or to an urban forest programme, such as a senior government incentive programme for urban forest development, filling the framework is already a daunting venture. However, if we define the urban forest as all of the trees in a city, and the city represents any one of Canada's dozens of cities and large towns, then framework implementation seems an overwhelming task. For comparative studies of urban forest governance, an instrument like the framework is absolutely essential, but the complexity of urban forest governance in Canada makes detailed description and analysis of any particular case, comprehensively

speaking, a large project indeed. For our purposes here, we will take a much more modest approach and, while lacking a complete picture of what urban forest governance looks like in Toronto and Halifax, we will try to understand the actual and potential roles of three NGOs in shaping urban forest development.

Methods

Our approach to this paper's content has relied upon: (a) examination of a range of literature on the governance of natural resources and the environment; (b) personal knowledge and experience of urban forest governance in Halifax, gained largely through our work in preparing and implementing the HRM Urban Forest Master Plan (HRM Urban Forest Planning Team, 2013); (c) preparation of three short accounts of NGO involvement in urban forest programming; and (d) a brief comparative analysis of these accounts in the context of the roles of NGOs.

Case Accounts

Preamble

The process of choosing cases has been highly biased by our experiences. We chose the Toronto case given its national reputation and the fact that one co-author (JS) is involved with it. We chose Clean Nova Scotia because it is a highly successful Nova Scotian NGO that is just now moving into urban forest programming. Finally, we admit that the choice of Dalhousie University may seem odd in the context of this paper, particularly because universities are not the first kind of organisation that comes to mind when one considers NGOs. In the strict sense of the term, most universities are indeed not arms of government – they are not-for-profit organisations with missions associated with scholarship. We include Dalhousie in our study partly because it has just developed its own urban forest plan, and partly because of the unique relationship we have developed with the Halifax municipal administration in research and development associated with the municipality's urban forest.

Toronto: LEAF

Local Enhancement and Appreciation of Forests (LEAF) is an NGO focusing on urban forest

stewardship in and around Toronto, Ontario. LEAF was created in 1996, when it was involved in distributing tree seedlings in an individual residential neighbourhood (LEAF, 2006). This initiative spawned its Backyard Tree Planting programme, which has since become the core programme of the organisation. Following the city's amalgamation in 1998, LEAF expanded the Backyard Tree Planting across the new City of Toronto and more recently into the neighbouring York Region, with funding from municipalities, power authorities and community grant programmes.

The Backyard Tree Planting programme is a subsidised tree-planting initiative for privately owned properties, and consists of a consultation with a certified arborist, the supply and delivery of a native tree or shrub, tree/shrub planting and education on appropriate tree/shrub care. Property owners pay \$150 to \$200 per tree (including the consultation and planting), which is approximately half of the per-tree cost to deliver the programme. As of 2013, over 10,000 native trees and shrubs have been planted through the programme, with a survival rate of 95%. The high survival generated by the programme is notable and vital, as tree mortality rates tend to be high in urban settings, especially among newly planted trees (Koeser *et al.*, 2013). Lastly, an important backdrop to, and impetus for, the programme was to increase tree cover and enhance stewardship on privately owned residential properties, where over 60% of Toronto's trees are situated (LEAF, 2006; City of Toronto, 2010).

LEAF has since expanded into other areas of urban forest stewardship through additional programming, most of which is focussed on outreach, education and capacity building. This includes the organisation's other major programme that was developed in response to the emerald ash borer (EAB), an invasive alien pest species. The EAB Ambassador Program is designed to attract and educate volunteers on ash (*Fraxinus* spp.) identification, signs of EAB infestation and management options (e.g., treatment, removal and planting). EAB ambassadors are subsequently encouraged to canvass their neighbourhoods, speak at community events and engage with social media to raise awareness of the EAB and management options. The Tree Tenders Volunteer Training is an additional and more general capacity-building programme that consists of an educational course on tree care designed for non-experts and is intended to engage and build the

volunteer base. Additionally, the organisation has been involved in scholarly research through partnerships with local universities. Such research has included socio-demographic analysis of engagement in urban tree-planting programs (Greene *et al.*, 2011) and an analysis of residential energy conservation attributable to tree shading (Sawka *et al.*, 2013).

Arguably, the major contribution of LEAF to sustainable urban forest management has been through its partnerships with government, industry, academia and the public, thereby contributing to a more inclusive model of governance. By engaging in management activities itself as an NGO (e.g., tree planting on private property) and, more importantly, by building social capacity through educating and training the public in stewardship activities, LEAF has helped to align Toronto and surrounding municipalities with a more inclusive and sustainable model of urban forest governance (Lawrence *et al.*, 2013).

Halifax: Clean Nova Scotia

Clean Nova Scotia (or Clean NS) is a non-profit environmental education organisation with a mission to increase Nova Scotians' understanding of the importance of environmental stewardship and to provide them with the resources and tools to take positive action regarding the environment (CNS, 2005). Founded in 1988, Clean NS seeks to create a sustainable society by delivering a host of programmes that results in positive environmental change. When established, the foundation focussed primarily on the commitment to discourage littering, promote recycling, conduct research and provide educational materials to the public (Government of Nova Scotia, 1999). The organisation's core values – innovation, teamwork and collaboration, respect, dedication, and a fun working environment – continue to direct the work of employees, volunteers and community partners (CNS, 2014).

Clean NS has grown tremendously since its inception. Having only two staff members during its initial five years, Clean NS now routinely has well over 100 paid staff. This growth is mirrored in its programming portfolio, which today delivers on six major focus areas: climate change and energy, community engagement, water, waste, transportation, and youth education. These programming areas are strongly integrated and employ a mix of activities to achieve

their goals. Presentations, resource provisioning, on-site visits, and peer-learning networks are examples of the ways in which Clean NS helps Nova Scotians take action in these areas.

After 25 years of work, Clean NS is now the largest environmental educational not-for-profit organisation in Atlantic Canada. Clean NS credits programme success largely to the value added by volunteers. In the 2012 programming year, Clean NS benefited from well over 12,000 volunteers who collectively donated over 44,000 hours of time to Clean NS activities (CNS, 2013). The success of the organisation is also reflected in the demand for information and resources provided on Clean NS's website, which welcomed over 30,000 unique visitors in 2012. Moreover, the audience on social media platforms more than doubled in 2012, and media relations, membership engagement and the creation of outreach materials continue to grow (CNS, 2011).

Until now, Clean NS has not engaged in direct work on urban forests. However, trees have been planted under Clean NS's auspices in association with its programming on the protection of urban riparian zones. Indeed, Halifax has long lacked an NGO that pays significant attention to trees in the city. At time of writing, Clean NS and the HRM administration were negotiating a memorandum of understanding on comprehensive programming. A major cornerstone of such programming will be a range of initiatives dedicated to the implementation of the HRM Urban Forest Master Plan's priorities on citizen outreach, education and stewardship. One such initiative will be the coordination of volunteer planting events where local businesses and service clubs will plant seedlings on Halifax parkland in an effort to increase naturalised woodland in the city.

Halifax: Dalhousie University as Landowner

As a large private landowner (of some 30 hectares) in Halifax, Dalhousie has under its management more than 1,000 trees spread over three urban campuses (Dalhousie University, 2014). Many generations (since 1818) of decision-makers and management documents have guided the landscape transformations at Dalhousie. Campus landscapes have undergone several development cycles, shifting the landscape from a treed Acadian Forest ecosystem to farmland with modest human settlement, to

compactly developed suburbs, to the development of academic buildings and, more recently, to a period of urban densification that jeopardises urban forest sustainability (Dalhousie University, 2010a). The earliest mention of tree management was in a 1912 campus master plan (Kelly, 1986), under which an oak-dominated (*Quercus rubra*) woodland in the southwest corner of the Studley campus was set aside for future generations. However, in the last century there have been few controls to safeguard this woodland and other trees on campus.

A number of factors have contributed to Dalhousie's pursuit of sustainable urban forest management. First, a full campus tree inventory revealed an uneven age-class and species distribution (Dalhousie University, 2014). Second, student activists, mainly the Dalhousie Student Union Sustainability Office (2014), pressed for an expanded set of values to be considered during management (e.g., food production, education). Third, establishment of the Office of Sustainability (Dalhousie University, 2010a) triggered a review of all campus operations, including grounds management. Fourth, the HRM Urban Forest Master Plan (HRM Urban Forest Planning Team, 2013) identified the Dalhousie campus as an anomalous landscape (i.e., low in tree canopy cover and high in imperviousness). In part, these factors led to the inclusion of a landscape section in the 2010 Campus Master Plan (Dalhousie University, 2010b), the release of a Natural Environment and Landscape Policy and Guidelines document (Dalhousie University, 2013) and, most recently, a 2014 Natural Environment Plan (Dalhousie University, 2014). The 2014 plan is unique as far as campus plans go because it formally addresses campus stakeholder values in the management of campus trees (Dalhousie University, 2014).

A cornerstone of the 2014 Plan is a diameter replacement policy for removed trees. Any tree felled on Dalhousie property must be replaced with calliper trees or whips with a combined basal diameter equal to the diameter at breast height of the tree removed. Beginning in 2014, some 200 new trees were planted on campus to replace 47 trees lost from the oak woodland to new construction in 2011. A tree improvement programme is underway to improve tree species diversity (primarily species native to the Acadian forest), to improve age-class diversity and increase tree density. Future urban forest projects are dependent on partnerships with Halifax (e.g., coordination on the municipal rights-of-way

around the campus), with design professionals (i.e., those designing buildings and landscapes), with the campus population (i.e., faculty, staff and students who value trees in different ways) and with the neighbouring residential and business communities.

The Natural Environment Plan calls for a plan review in 2015, 2020 and 2030 to ensure that stakeholder values are being satisfied and that the plan is adequately addressing targets for tree density, diversity and health, among others (Dalhousie University, 2014). A future challenge will be to allow for campus development in a way that does not compromise current and future tree-planting opportunities. Beyond a moral obligation to safeguard the natural environment (Viebahn, 2002; Christensen *et al.*, 2009; Nejadi *et al.*, 2011), the way in which the urban forest is managed says a lot about the way Dalhousie values trees and the environment. As a prominent institution in Halifax and the current home of future leaders, the image that Dalhousie portrays is important. The university sets an example to students, staff and faculty, but also sets standards for urban forest management at private institutions.

Halifax: Dalhousie University as Agent of Research, Education and Development

Based on a positive collaborative experience between Halifax administrative staff and the senior author (PD), in association with development of the Point Pleasant Park Comprehensive Plan (NIP Paysage Landscape Architects *et al.*, 2008), a new partnership was formed in 2007 involving the same city and university personnel for the purpose of developing Halifax's first Urban Forest Master Plan (HRM Urban Forest Planning Team, 2013). Since 2010, annual research-service contracts have been awarded by the city to the university for the express purpose of engaging a professor (PD) and several students to assist the city in undertaking background research and developing materials for the plan. All of the authors of this paper were intimately involved in this process, along with about ten other students over the years. Once the plan was endorsed by the HRM Council in autumn 2012, subsequent contracts with Dalhousie focussed on research, monitoring and other support for plan implementation.

Because the Urban Forest Master Plan was developed through an intimate collaboration of city staff and

university scholars (both junior and senior), it is fair to say that Dalhousie, as an NGO in our interpretation here, had a profound influence on the direction of urban forest management as documented in the plan. The Dalhousie team was not just undertaking research projects to inform plan development: the majority of the plan was actually written by members of the team (of course, under the watchful eyes and editorial pens of the city staff). The point here is that a group of scholars at a university was, and still is, central to the governance of the urban forest owned by the municipality.

Analysis

It is instructive to return to the roles identified earlier for NGOs. Let us examine each and reflect on the cases just described.

- Advocate for urban forest improvements – all three NGOs examined engage in this kind of work in a quiet way; this means that they urge all actors to work toward urban forest improvement and rarely take municipal governments and other actors to task publicly for inadequate performance in urban forest management.
- Educate citizens about city trees and their management – all three NGOs engage in this type of work through the production and dissemination of literature and online resources, and public meetings and educational activities (e.g., Canadian Urban Forest Research Group, 2013).
- Implement research that points to opportunities for urban forest improvements – LEAF and Clean NS collaborate with researchers on scholarly investigations, and Dalhousie people are strongly engaged in research work (e.g., Duinker *et al.*, 2013).
- Demonstrate urban forest stewardship on their own land – Dalhousie is the only NGO of the three included in this study that owns land, and is about to launch exemplary urban forest management under its Natural Environment Plan (Dalhousie University, 2014).
- Organise and facilitate citizen-engagement and citizen-stewardship programmes – LEAF and Clean NS excel at these kinds of activities, existing as they do largely for this.

- Bring philanthropic and other funds to the enterprise of urban forest management – all three NGOs, as not-for-profit registered charities, attract such funds to support urban forest development. Dalhousie is a special case where faculty members can and do attract granting-council research funds that are not available to other kinds of NGOs. The findings from our own grant-funded studies (e.g., Peckham *et al.*, 2013) have influenced urban forest management in Halifax.

Conclusion

We are unable at this point to say with absolute confidence that success in urban forest management requires the existence and active participation of NGOs. However, the preliminary evidence as marshalled herein suggests that NGOs can be influential agents of urban forest improvements through their various roles and activities. The NGOs examined in this paper are not merely implementation agents of hands-on programmes like tree planting; they are multi-faceted organisations playing active roles in the broad realm of urban forest governance. We therefore return to our hunch that the rate of advance in urban forest sustainability may well be directly related to the influence of NGOs dedicated to this cause. Clearly, this hunch should be turned into a formal research hypothesis. If we were to undertake detailed case studies of urban forest governance according to the framework advanced by Lawrence *et al.* (2013) in a range of cases across Canada, would we find that NGOs are central to the cause of urban forest sustainability?

Without doubt, the roles of NGOs represent but a small fraction of the intricacies and complexities inherent in a comprehensive understanding of urban forest governance. It would be helpful in both scholarship and practice associated with urban forests to discover much more deeply how NGOs can and do contribute to urban forest sustainability. On the practical front, we have no hesitation in urging cities and towns that lack NGO interest and capacity in urban forest governance and management to facilitate NGO establishment and the uptake of the urban forest development agenda.

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