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Urban Forest Conservation: What Kind of Strategies Should be Adopted in the Montreal Metropolitan Area?

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ABSTRACT: This paper presents the results obtained with respect to the protection of natural areas in the Montreal metropolitan area (Canada) following the publication of government policies in 2001. These policies were developed by an ad hoc task force made up of experts and lay people from three disciplines – plant biology, urban planning, and landscape architecture – all working for government agencies and community-based groups. Discussions revolved around defining the concepts of "urban nature" and "urban forest," as well as on deciding which strategy should be adopted. An approach based on landscape ecology was proposed. Two years later, the task force's main recommendations have yet to be implemented. The argument being made is that transactions between disciplinary cultures and organizational affiliations are largely the reason why it is difficult to apply the proposed strategy. The theory of transactional analysis was used to counter the argument. Interviews conducted with the ad hoc group participants have shed light on the terms of the social transaction that occurred and allowed its subsequent fragility to be determined. A correspondence analysis performed using the content of interviews shows that the terms of the compromise were not accepted by the participants following the report's publication and that the experts remained grouped around their original positions. The concepts of urban nature and urban forest thus remain difficult to define from a theoretical and methodological standpoint, which makes them even more difficult to apply.

Keywords: Urban forest, urban planning, conservation strategies, architecture landscape, landscape ecology, social transaction, public policy

INTRODUCTION

In 2001, the Quebec government launched a public consultation process to define a strategy on protected areas with the aim of meeting the IUCN standard, i.e. to protect 8% of the province's territory. Biodiversity protection was presented as a very important issue. Moreover, it was understood that the conservation strategy would not apply solely to large spaces in northern Quebec, but also to inhabited areas in the urbanized southern part of the province. At the request of community leaders, a specific consultation process on urban and suburban areas was adopted. An ad hoc task force was set up and its main recommendation was to provide protection "to large geographic areas with special aesthetic, ecological or cultural features that are the result of past interactions with man and nature" [translation] (Québec government, 2001). In short, the approach retained involved setting up and protecting natural greenways and human-made landscapes. The task force's work included reaching an agreement with biologists, urban planners and landscape architects who, while promoting approaches originating from their respective fields, were seeking a solution adapted to urban areas.

Discussions thus took the form of a social transaction, as defined by sociologists such as Jean Rémy and Maurice Blanc (Blanc et al., 1992; 1994; Rémy, 1994; Voyé et al. 1996). The term social transaction refers to a procedure of conflict resolution, characterized by several phases, including discussion, cooperation, impasse, and imposition. The outcome of the social transaction, which took place within the ad hoc task force, was a break with approaches that favored the conservation of large natural spaces as delimited and unconnected sites under government control. A definition of biodiversity was proposed that took into account "the social value of landscapes" [translation] (Québec government, 2001, p. 42). The publication of the ad hoc task force's report led to government intervention. However, the large-scale project involving the networking of protected areas and landscape protection did not take place. The compromise that was reached during the task force's work would not be applicable during the planning activities that followed. It should be noted that not only did the network project not see the light of day, but no further mention was made of it in the government program. The aim of this paper is to understand the reasons for such a relative failure. The argument being defended is that transactions between disciplinary cultures and organizational affiliations are largely the reason why it is difficult to apply the strategy being proposed. In other words, the strategy adopted in the report did not correspond to the disciplinary cultures specific to each professional group that took part in the consultation process, nor did it meet the requirements of local organizations involved in defending and protecting specific sites. It simply duplicated the principles of landscape ecology, while no landscape ecologist actually took part in the discussions. In short, the terms of the compromise did not draw on a field of shared knowledge, nor were they the result of practices carried out within the professional or community life of the task force members.

URBAN NATURE & URBAN CONSERVATION AREAS

The terms "urban nature" and "urban forest" are now in the forefront of urban reality, while there is a growing social demand for nature conservation and the development of parks and green spaces. Similarly, it is difficult to keep track of the many environmental controversies that can be likened to the famous NIMBY syndrome (Not in my Back-Yard), involving citizens determined to save a forest or wetland. This being said, it is crucial to come to an agreement on the terms and determine the reasons for preserving or developing urban nature in one form or another. We know that conservation projects used to be based on scientific fact, namely the need to save parcels of unaltered nature, and could thus find a high social consensus. With respect to urban nature, this so-called consensus is very weak and, furthermore, the arguments in favor of its conservation are surrounded by uncertainty (Géron and Vandermotten, 2002; Cronon, 1995).

The problem resides in the fact that the terms “urban forest” and “urban nature” are not clearly defined. This is particularly evident when a proposal is made to remove a natural landscape such as a forest from urban development. Key actors working for government agencies or community groups can then choose between three different approaches, not necessarily opposed or complementary, to structure their actions aimed at protecting a natural area or landscape. The first approach involves plant ecology and applies to the conservation of areas representative of natural ecosystems. Landscape architecture or green urbanism is the second approach based on the use of open green spaces for recreational purposes in the city. The third approach, landscape ecology, pertains to the fragmenting of natural areas and the heterogeneity of ecological systems when in contact with human society. These three approaches define specific vocational practices, i.e. those of biologists or ecologists, landscape architects, and urban planners. Each profession makes use, in its own way, of the terms “nature,” “forests” and “natural areas.” They do not have a common system of arguments to justify the protection of nature applied to an urban environment.

With respect to plant ecology, conservation strategies are usually based on criteria such as rarity, representativeness, uniqueness, and vulnerability (Eagles, 1980; Cooper and Zedler, 1980; Bastedo, Nelson and Théberge, 1984). These criteria have traditionally applied to large natural areas representative of a regional ecosystem and are used to determine Environmentally Sensitive Areas (ESA). This type of approach is characterized by a desire to protect ecological integrity, unaltered natural systems, wildlife, exceptional natural elements, and to maintain wildlife and plant habitats. In this context, conservation uses strong arguments such as the loss of rare or unique areas or a decrease in ecological biodiversity. These arguments also generally favor the creation of a social consensus, and in so doing justify public action, such as the acquisition of a site or land area. Such a social consensus is all the more necessary given that the acquisition costs in densely populated urban areas are always substantial. However, such sizeable natural spaces are difficult to find in highly urbanized areas. Furthermore, those that remain, such as relict forests, are rarely sufficiently large to justify a critical carrying capacity to conserve the target species.

Furthermore, it should be added that the urban forests that are the focus of preservation efforts are not always exceptional or even highly representative of natural ecosystems. In fact, a large portion of natural greenways in urban areas are in poor condition. They may be left over from horticultural plantations. How, then, can one identify and protect transformed and disrupted urban areas that are more a reflection of human activity than of wildlife? The status of these areas is usually justified by their recreational function or aesthetic nature. The city thus appears as an area of special horticultural and landscaping exploration, with the park as its emblem. Parks, park systems, avenues and walkways are the product of landscaping design and architecture. The developed landscape uses a pictorial and aesthetic approach (Tobey, 1973). In a famous article, Frederick Olmsted, the father of landscape architecture, emphasized the park’s social function (Olmsted, 1870). The Olmstedian park is designed to respond to moral, aesthetic and public health considerations (Starr, 1984). Is one of the primary purposes of urban nature not to incorporate walkways, alleyways and corridors for the citizens’ benefits (Noss, 1993; Whiston Spirn, 1995)? In landscape ecology perspective, the term “urban forest” is not relevant: Tandy’s Handbook of Urban Landscape (1973) did not mention the word “forest”; only trees are of any importance because of the benefits they procure, whether social, climatic or aesthetic. It may cover two fairly different realities. For some, the urban forest is the sum of all vegetation found in an urban area. Thus, the urban forest appears like a major factor to create livable areas (Whiston Spirn, 1995). For others, it consists of specific areas covered with dense vegetation characterized by a tree stratum. In both cases, the urban forest is considered to be a source of well-being for citizens.

The natural dimensions of urban landscapes began to play a greater role in landscape architecture with McHarg’s publication of Design with Nature (1969). McHarg looks at the interactions between urban development – especially that of suburbs – and the

transformation of the natural environment. The inclusion of resources and the natural processes found in the city has now become a concern for those involved. Plant succession and the distribution of species in the metropolitan area now justify the use of conservation or landscape creation measures: the urban designer's job is then to establish connections, link up different types of areas (Hough, 1984; 1992; Saint-Laurent, 2000). The current greenway movement is largely based on its predecessor, the park and boulevard movement (Fabos, 1995; Zube, 1995). However, it introduces new notions such as the natural corridor and diversity of species (animal or plant) (Smith and Hellmund, 1993; Harris, 1985). It finds unexpected sites of application such as abandoned lots and public utility right-of-ways, or in small areas structured in a continuum.

The concept of urban nature is therefore presented to include sites with an often heterogeneous vegetation cover, usually small in size and subject to continuous disruption. It basically appears with the first botanical inventories conducted in urban areas, whereas the focus is on identifying ruderal types of vegetation noted in disrupted sites that underwent spontaneous renaturalization (Lizet, Wolf and Celecia, 1999; Sukopp, 1999; Sukopp and Werner, 1982; Sukopp and Hejny, 1990). For instance, the term ruderal refers to "weedy vegetation growing on compacted, ploughed, or otherwise disturbed ground and showing a preference for this type of habitat" (i.e Biology Online.org). The efficiency of non-indigenous species in colonizing sites and in propagating in nature appears as a constant in the plant dynamics of urban areas (Sachse, Starfinger and Kowarik, 1990; Gilbert, 1989). According to Gilbert, urban vegetation is characterized by the introduction of exogenous species and by a plant succession that is strongly influenced by the presence of dissemination corridors taking the form of railways or electrical transmission corridors as well as the presence of open areas (Gilbert, 1989). Using this argument, urban vegetation would be subjected to disruptions resulting from urban development. The urban forest would be made up of a mosaic of fragments forming a discontinuous landscape (Bastin and Thomas, 1999; Forman, 1995). The concept of urban forest as a "hybrid" reality involves considering the various types of ground cover as a whole, whether they are the result of horticultural activity, spontaneous renaturalization, or a relic of a natural forest. One finds patches with different natures and functions. In fact, it is typical of landscape ecology to note the formation of heterogeneous, even anthropogenic, landscapes characterized by unit fragmentation and substantial connectivity (Burel and Baudry, 1999; Hobbs and Wilson, 1998; Saunders Hobbs and Margules, 1991; Forman and Godron, 1986). One of the aims of urban development would precisely be to ensure animal movement and seed propagation (Soulé, 1991). Greenways would have an ecological function since they ensure connectivity and act as reservoirs of biodiversity (Smith and Hellmund 1993; Labaree, 1992). The 1980s were in fact characterized by a desire to revise the bases and criteria of nature conservation. Criticism of the central concepts of conservation paves the way to new approaches (Shrader-Frechette and McCoy, 1993). On the one hand, there is discussion of the scientific and epistemological bases of conservation, while on the other hand, the aim is to expand conservation criteria so that they can be adapted to the reality of greenways and corridors, for instance. Thus, to the ecological criteria of rarity and uniqueness are added cultural criteria such as landscape quality, historical heritage, users' perception, and connectivity (Ndubisi, DeMeo and Ditto, 1995).

In summary, three major conceptual bases are used to discuss urban nature. They help delineate the criteria used to support the maintenance of urban nature (Table 1, page 5).

These three disciplines are well-established and identifiable through specific concepts and methodologies. They sometimes use the same terms. For instance, the term "biodiversity" is used with all three approaches, but is not understood in the same way. Biologists define biodiversity as the richness of indigenous species associated with a biotope or specific natural ecosystem. They propose measures for protecting biodiversity within a localized area representative of the regional environment. Landscape architects, for their part, define a

TABLE 1 Examples of TDR Programs, Starting Year, and Acres Preserved

Aspects/Disciplines	Plant Biology	Landscape Architecture	Landscape Ecology
Plant composition	Ecological biodiversity	Landscape formation	Humanized biodiversity
Objectives of measures/ actions	Maintaining the integrity of ecosystems or natural area networks	Integration of nature into the urban habitat	Connectivity between natural spaces and built-up areas
Organization and planning	Acquisition of an area reserved for conservation	Recreational greenway	Patches and corridors set up in a network

human-made nature that includes imported agricultural or horticultural species. Some authors refer to “urban biodiversity” as including plant formations in cultivated and domestic areas, along with their wild counterparts, found in semi-natural, urban and industrial systems. In fact, one author considers that most biodiversity is found outside protected areas (Celecia, 1999, p. 249). Nor do the three approaches have the same aims. Plant biology is concerned about maintaining ecological integrity. Landscape architecture uses an action-based approach to support urban greening. Landscape ecology stresses the phenomenon of fragmentation and contact between human activities and ecological systems (Burel and Baudry, 1999, p. 10).

In short, the debate revolves around the terms of nature conservation, integration or human-made nature (Table 2). It qualifies the conventional opposition between the wilderness and the inhabited world, and it differs also from the theory of three types of nature (unaltered, cultural and aesthetic-symbolic) proposed by Dixon-Hunt (2000). The three approaches discussed in this paper focus on different and diverging disciplinary goals.

These three approaches refer to different terms that give meaning to the attempt to preserve parcels or sites found in urban areas. Without being in opposition or mutually exclusive, the approaches form separate scientific paradigms. Nature conservation is understood, within the concept of plant biology, to represent a desire to maintain rare plants or to preserve natural heritage. The purpose of studying landscape ecology is first and foremost a discipline that involves studying the fragmentation of natural environments. Lastly, in landscape architecture, spaces suitable to the urban environment are designed at sites or facilities that meet certain needs and which are intended to promote quality of life and preserve cultural heritage. All of the terms shown in Table 2 represent specific conservation strategies based on objectives or arguments that serve as references for all of the analyses and interventions that target urban nature.

TABLE 2 The Terms of Urban Nature Approaches and Conservation Strategies

Terms in Plant Biology	Terms in Landscape Architecture	Terms in Landscape Ecology
Rare plants	Ordinary landscape	Quality of life
Ecosystem health	Democratic and participational planning	Accessibility of recreational equipment
Natural heritage	Public-private governance	Cultural heritage

Based on these diverging agendas, discussions are initiated and arguments presented in favor of urban nature conservation, production, or integration strategies. Ecological criteria are put forth, in particular for maintaining the ecological quality or integrity of the ecosystem. Concurrently, social criteria such as quality of life, accessibility to recreational greenways, or the enhancement of residential areas are added. By questioning such discipline-based cultures, one must recognize that they are not entirely rigid or immutable. They are social realities, scientifically proven, but discussed constantly and subjected to the different social contexts in which they evolve. The disciplinary boundaries are permeable, not impenetrable.

CASE STUDY

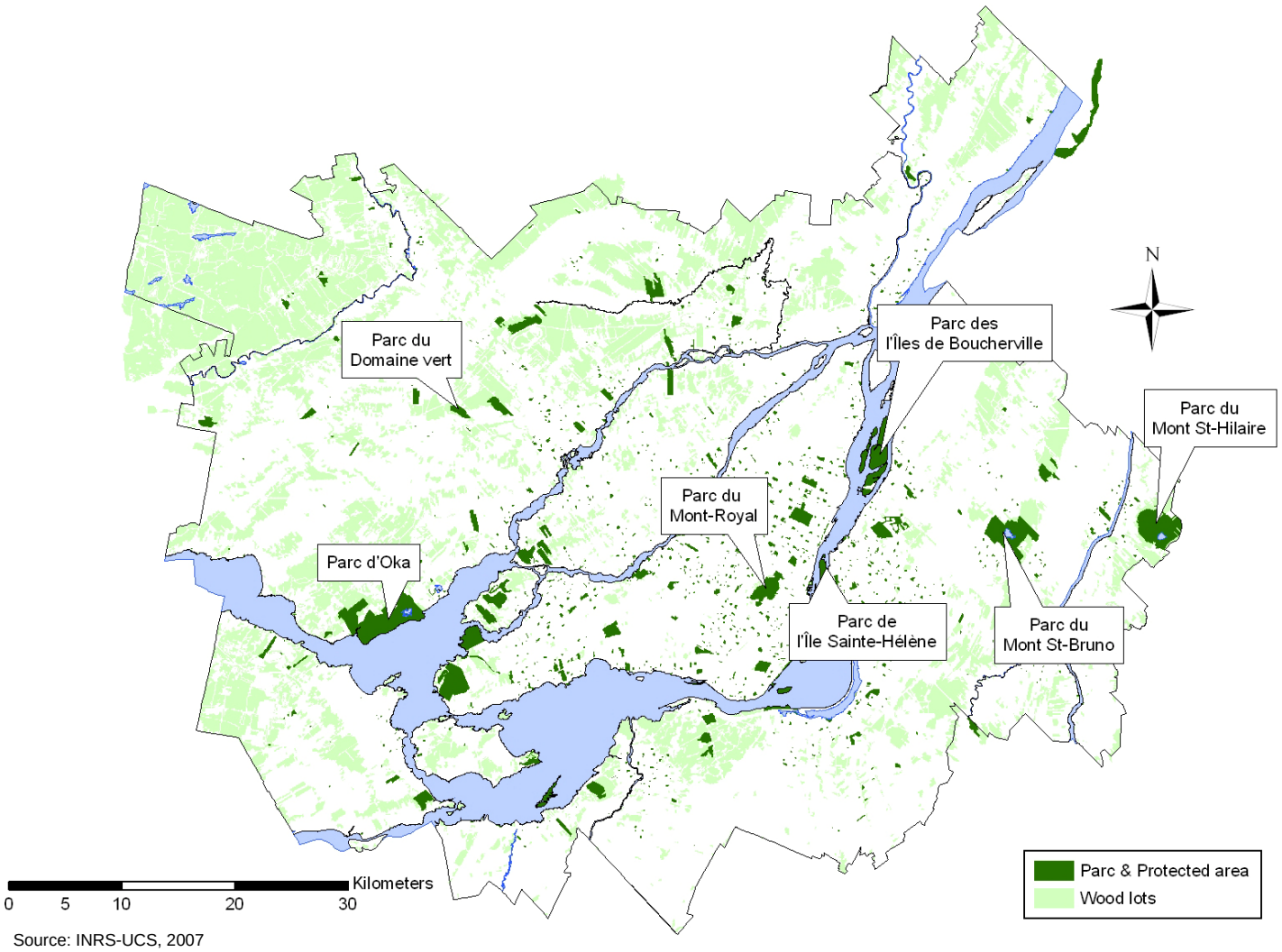
This section relates to the Montreal situation and the difficulties in planning the metropolitan forest. In 2001, the Montreal metropolitan region's urban forest covered more than 13% of the Montreal metropolitan area's territory. From 1986 to 2001, over one tenth of the forest was lost, with a decrease of 14% to 13% (Sénécal, Hamel and Boivin, 2001) (Figure 1, page 7). Attempts at greenway and waterway planning, started in the 1960s in an effort to preserve the largest natural areas or set up a park system, were relative failures (Sénécal, Hamel and Boivin, 2001). It is true that slightly more than 4% of the metropolitan area's territory is currently protected. It includes 57 protected areas, mostly small in size, with different statuses. These areas include 16 natural urban and regional environment parks, created without any attempt at forming a network (Québec government, 2001, p. 18-20). The Québec legislative context remains limited, to the point where one observer qualified the protection as "ambiguous and recent" (Grandbois, 1984, p.4). Even the conservation of a permanent agricultural area is a dubious acquisition: substantial losses occur, particularly in the form of farmland woodlots.

This feeling of failure haunts the organizers of the consultation process, who would like to launch a specific process in an urban and suburban context. The Québec department of Environment, together with the former Montreal Urban Community's Urban Planning Department set up an ad hoc task force made up of about 40 members from public organizations, institutions, and non-profit organizations working in the fields of development and nature conservation. The consultation meetings, which were held in February and March 2001, involved two stages. A few experts had to set up workshops for a more extended group made up of representatives from institutions and organizations working in the fields of conservation and the environment as well as other individuals working locally on protecting a specific site. Some participants operate on a local scale. They are hired by a government agency, a municipality, or association created for the purpose of protecting a specific site. Others operate from a more metropolitan perspective. Some must, just like Québec environment ministry officials, promote the government's viewpoint. These actors are also known for their organizational affiliations and technical knowledge, which broaden the discussions on the strategy used for protected urban areas. Moreover, they make up informal affinity circles. In the case under study, one of these circles seems to have dominated the discussions and imposed the approach involving greenways and landscapes to the detriment of an approach based solely on maintaining biodiversity. In attempting to understand such an outcome, one needs to observe the social transactions produced during the ad hoc task force's work.

Negotiating a Conservation Strategy: A Social Transaction Process

The consultation process was an opportunity to bring together social actors working in the field whose association dates back many years, and energize their discussions. This provided a forum where conservation issues can be defined, debated, negotiated and confronted. These actors, immersed in a social transaction process, sought to devise a common strategy. It is interesting to note that this government strategy was defined outside of restricted circles of professionals from various government and municipal departments. It

FIGURE 1 Montreal's metropolitan forest.



Source: INRS-UCS, 2007

reflected interactions and collaborations resulting from associations between community groups and government-agency representatives.

Community group representatives, for their part, need to have their point of view heard and try to influence decision-making. Government-agency representatives were seeking new legitimacy obtained by the involvement of community groups. This is the context in which the theory of social transaction is being referred to (Blanc, 1992; Freynet, Blanc et Pineau, 1996). The latter is designed as a means to understand how social actors interact and are able to exchange points of view, starting from their specific interests, and reach a decision. Social transaction analysis thus serves to understand the compromises reached among the social actors and to reveal the rules of the game and the forms of negotiation that led to such a so-called consensus (Voyé, 1996). The transaction is in fact formed of two extremes, i.e. negotiation and imposition. It can thus lead to a solution that is negotiated or one that is imposed. This theory, described by its creators as an emerging paradigm, claims to offer a framework for observing exchanges of a social nature that confront social actors in conflict. It reiterates sections of the strategic and organizational strategy, as developed by Crozier and Friedberg (1980), by proposing to define the strategies and the interactions among the actors. Its intention is to extend the organizational perspective, specific to Crozier's and Friedberg's analysis, by examining the relationships between formalized organizations, such as public agencies, and civil society, or associations and community groups. Negotiation mobilizes knowledge, identities, and specific interests such that each social actor involved in the social transaction has special characteristics. In so doing, the social actors are motivated by well-defined intentions that they will project into the social transaction system. Some are thus determined to have a point of view heard which they inherited from their professional culture such as biodiversity conservation, as in the case that concerns us here. Others seek to promote their particular project, such as the creation of a conservation area or a park in their neighborhood. These different agendas are faced with having to reach a common point of view which, in some way, should represent a general interest. Social transaction may thus be seen as a way to include specific intentionalities and a general interest. It is also the outcome of negotiation and reflects a relative balance between the two positions. The actors are not equal there and the compromise may be unfavorable in the eyes of some of them (Rémy, 1994).

In the context of environmental debates and the scientific uncertainty surrounding the disruptions experienced by nature and ecosystems, public authorities are looking for solutions that have been negotiated with civil society in forums specifically aimed at reaching a compromise and proposing a so-called consensual strategy. The transaction process observed during the course of this study was in fact made up of experts and lay people with definite expertise acquired during their education or professional or volunteer work. The ad hoc group was a public forum, open to diverging or opposing points of view, where technical choices were the main object of debate. Its mission was to adopt a shared strategy, one that would be accepted more or less consensually by most participants. The ad hoc group's workshops are, in our view, a good example of a transactional process designed to respond to the uncertainty surrounding the management of greenways and natural areas in the metropolitan area. The group brings together multi-faceted actors in order to define common solutions. Drawing on social transaction sociology, the aim is to determine, on the one hand, the type of negotiation and cooperation that led to the creation of a new approach in nature conservation for the Montreal area. On the other hand, it would be interesting to verify, a posteriori, the solidity of the compromise and to describe and analyze what kind of follow-up was done for the solution presented in the 2001 report.

Creating an Acceptable Compromise

The primary objective that was set by the task force was to update the usual criteria for biodiversity conservation. These criteria should apply to highly humanized and transformed environments. The first meeting included an overview of initiatives in the Montreal area since 1850 regarding the protection of natural environments. At the second meeting, a wide range of mechanisms (e.g. laws, regulations, taxation) was presented, along with two cases that could serve as examples, i.e. the natural regional parks in France (Parcs Naturels Régionaux français (PNR) and the Coastal Conservancy in California. The group of experts was made up of six urban planners or landscape architects and three biologists from the environment ministry. The urban planners and landscape architects form a long-standing affinity circle. They have the same institutional origin (i.e. university faculty) and share the same perspective. In fact, they have long been arguing for a postmodern planning approach, as they consider the creation of enclosed urban parks out of date and grant little importance to nature conservation and ecological biodiversity. In the past, they sought to apply such a strategy, in particular for greenway and waterway projects in Montreal, or to use reasoned planning for natural areas in the metropolitan area. They thus advocate for a project and are a dominant force within the task force. Biologists do not form an affinity circle under the same meaning. Their sole point in common is that they are employed by the environment ministry or are in direct contact with the ministry and, incidentally, have to apply the rules and regulations enacted by the Quebec government with respect to conservation. This is why they merely reiterated that the purpose of the consultation process was biodiversity conservation without imposing a conservation model that can be adapted to urban environments. They did not submit any clearly defined proposals, such that they left the field open to the urban planners and landscape architects who came from an urban planning faculty. In reality, the workshops simultaneously dealt with biodiversity and the conservation of natural areas as well as with the project involving the creation of a metropolitan green network.

This is how the policies that were to be subsequently adopted were developed even before the extended group's two workshops were held. The process thus requires the interconnection of the protected areas combined with the protection of landscapes. The two major documents produced by the group of experts are along these lines, namely the reiteration of past failures in the area of conservation in the Montreal area and the presentation of the French and California examples, which were presented as two models to be followed. The workshop activities confirmed the general direction which supports the networking and landscape approach. This compromise was reached by the various workshop participants, but was not formulated within the context of the dominant group's landscape architecture. The compromise, which will be modified in the report, is closer to the concept of landscape ecology. In the end, what is needed is to develop a metropolitan network made up of landscapes that have a social value and sites that meet certain requirements in terms of plant biodiversity.

The report discusses the complex character of the concept of urban nature and the weakness of the conservation mechanisms used in the province of Quebec, with none applying correctly to the natural and human-made landscapes in urban and suburban environments (Québec government, 2001). It was proposed that an accreditation mechanism be set up "aimed at creating protected areas that correspond to IUCN Category V," which refers to "protected landscapes or seascapes", i.e. "a land area that sometimes includes the coast and sea, with a landscape with special aesthetic, ecological or cultural qualities resulting from the past interaction of humans and nature and often characterized by considerable biological diversity. Maintaining the integrity of this traditional interaction is essential to the protection, maintenance and development of such an area." *[translation]* (Québec government, 2001, p. 41). The report's recommendations associate ecological biodiversity with the quality of human habitats and quality of life. Incidentally, the summary of issues in

the document handed out during the second workshop defined urban biodiversity as including both the abundance of species resulting from ecological processes and the cultural enhancement of landscapes resulting from interactions with human activity. The final report refers to a standard definition of biodiversity, namely that it is a "concept that pertains to the abundance and diversity of species, as well as the quality of habitats resulting from ecological processes occurring on different ecological scales, but in an urban environment the quality of human habitats and the residents' quality of life should be considered along with biodiversity" *[translation]* (Québec government, 2001, p. 42). The authors of the final report do not take this definition of urban biodiversity into account, even though it is brought up in documents submitted during the workshop sessions, in essence considerably based on the landscape ecology approach. They stuck, however, to the network approach. Six recommendations have been submitted to the government and community groups (Table 3).

TABLE 3 Summary of the Ad Hoc Task Force Report

Recommendations Submitted	
1	Inclusion of the social value of landscapes
2	Creation of a metropolitan network of protected areas
3	Accreditation of protected areas based on an IUCN Category V
4	Creation of a metropolitan body in charge of the network
5	Production of a frame of reference
6	Fund to help in the creation of new protected areas

Source: Québec government, 2001.

The first observation is that the proposed strategy does not recommend directly taking any action towards maintaining biodiversity. The report includes a definition of biodiversity, but nothing else. The second observation consists in recognizing that the recommendations are leaning towards landscape ecology (Table 4). The issues are designed to include the concepts of networks, fragmentation and corridors (Québec government, 2001, p. 31). Use of the concept of landscape is not only for identifying and protecting exceptional areas. The issues also cover both vernacular and ordinary landscapes. The third observation is realizing that the strategy does not only target the acquisition of sites using public funds. A purchase fund is, however, proposed and the protection of areas with high ecological potential is considered. This being said, the network approach is the dominant one. The idea is thus to create a management and coordination structure to oversee a set of areas with different statuses, tenures and purposes. Special prominence is given to a participative management approach: the network of protected areas should be connected to a network of local partners or actors and include public, semi-public and private spaces.

The proposed strategy departs from the models specific to the disciplinary fields found among the group of experts. Biologists, like urban planners and landscape architects, have thus agreed to a compromise, acceptable on both sides, but not part of the usual practices of their disciplinary field. Neither has a conservation strategy been chosen nor a strategy aimed at producing park- or greenway-type green spaces. There is continued talk about protected areas, but these are found in a larger grouping of natural green spaces pieced into a landscape system.

TABLE 4 Disciplinary Choices and the Chosen Strategy Process

	The Task Force's Compromise
Disciplines	Biology, Ecology and Planning to Landscape ecology
Goals	Nature conservation and manmade nature to Nature integration
Strategy	Planning a green infrastructure inspired by IUCN Category V

The policies submitted during the workshop by the affinity circle made up of urban planners and landscape architects stand out fairly well in the final report (Québec government, 2001). They are the result of the social transaction which involved several government bodies and community-based groups. The affinity circle may thus believe that it won the battle over the chosen strategy. In fact, one of its members, when interviewed, did not hesitate to say so.

The compromise involved proposing a new conservation-related paradigm by setting a metropolitan-oriented issue and defining the urban forest as an accessible landscape made up of different types of natural environments as well as by considering a management approach equally associated with public organizations, community groups and the public sector. However, it remains to be seen how these recommendations will be interpreted by the various government and municipal bodies. It also remains to be seen whether they will be implemented, and if not, why.

Reneging on the 2001 Compromise

Only two years were required to see the impact of the 2001 report, and incidentally of the ad hoc task force's work, on government policies and the regulatory framework with respect to conservation and urban development. There have been a number of new developments since then to mark the implementation of the protected areas strategy. The first is definitely the establishment of development policies which the Quebec government submitted to the new Communauté métropolitaine de Montreal (CMM), which is now responsible for the development of the metropolitan area and for its environment. One of the policies which the government submitted to the CMM refers to the protection of landscapes and urban forests (CMM, 2002). In this respect, an interim control regulation, applicable to 31 urban forests in the metropolitan area, is being proposed but has not been adopted. The purchase cost of these forests is estimated at CAN$300 million. The creation of a purchase fund, announced by the Quebec government, will not take place. It should be noted that a conceptual shift has occurred. The CMM has identified exceptional forests in view of their purchase over the long term but without providing for either an integrating concept such as a park and corridor system, or a managing body or organization likely to oversee such a system.

The provincial government, for its part, adopted in December 2002 a new legislation known as the Natural Heritage Conservation Act which created, in the same manner as a status for protected areas and ecological or biodiversity reserves, the status for the human-made landscape. The latter refers to an "an area established to protect the biodiversity of an inhabited area […] whose landscape and natural features have been shaped over time by human activities in harmony with nature." The landscape must possess outstanding qualities for such a status to be granted. It should also be noted that the definition of biodiversity corresponds to that of ecology, namely "the variability among living organisms from all sources." This status was never tested against reality. Furthermore, no site is currently being considered in view of being granted special status. With respect to the municipal government, the City of Montreal has issued a policy for the protection of natural areas, which specifically mentions the concepts of biodiversity and landscape. The policy's aim is to increase the size of the protected areas by forming "ecoterritories", which will consist of a core, generally a park or a municipal property, surrounded by a buffer zone where an attempt will be made to reconcile urban development with the maintenance of a representative plant landscape (Ville de Montréal, 2004). Lastly, corridors may be set up between the different fragments within a given ecoterritory. The approach is an innovative one for Montreal. It is modest in terms of surface area covered: the proposed ecoterritories add very few protected areas. Other municipalities in the metropolitan area have also sought to protect threatened forests. The observed results are limited. In short, two realities have come to the fore in the past two years: very few conservation initiatives have been completed and no organization was put in charge of applying the recommendations arising from the 2001 report, such as the creation of a metropolitan green

network in which landscape features would be taken into account, nor have any community-based groups been called upon to carry out the strategy.

The regulatory and legislative developments, which represent major gains for those who favored the pragmatic compromise resulting from the ad hoc group, were not followed by any concrete action other than what was done separately at the municipal level. In addition, the approach promoted by the new Communauté métropolitaine de Montréal (CMM) is rather conventional and consists in the acquisition of exceptional sites, without resorting to the use of the concepts of network and landscape. Still, one must recognize that the controversies surrounding the disappearance of forests with ecological or heritage value continue to mark, now more than ever, the metropolitan reality. In short, the social transaction that occurred in 2000 did not substantially modify the practices of the representatives from the organizations in charge of implementing the protected areas strategy. These representatives remained faithful to their disciplinary culture, as was the case at the CMM.

The Compromise Revisited

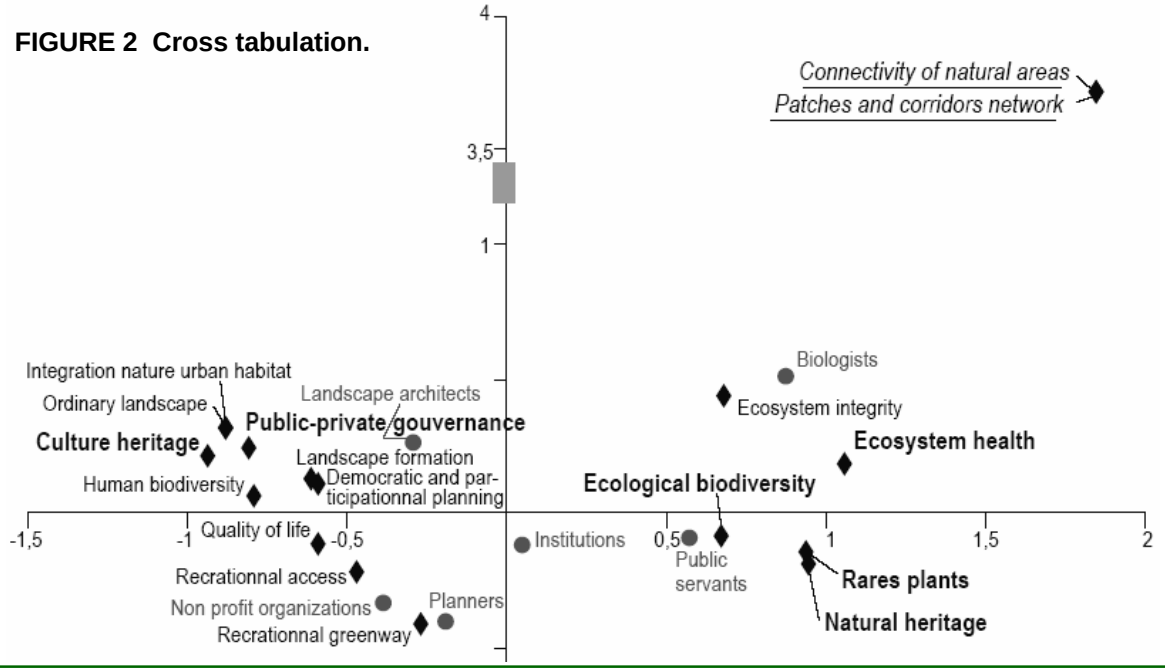
To find out more, we decided to meet with the ad hoc group members and review the compromise reached in 2001. We asked them to recount their experience and compare the policies in the 2001 report with their current practices. They were also asked to define their course of action and the approach they favour. Among the 41 task force members, we selected the 25 people who were actively involved in the discussions. Some of the participants who contributed little to the discussions held during the workshops were not interviewed. Five of the people on the list did not agree to meet or we were unable to do so. The following points were covered in the interview: the respondent's experience in nature conservation; his/her interest in taking part in the consultation process; what the respondent recalled from the ad hoc group workshops; respondent's reaction to the report; and, lastly, his/her personal understanding of the type of conservation undertaken and the related strategies in an urban environment. To check some of the responses provided during the interviews, more specific questions were asked to help define the meaning given by each respondent to the network approach and landscape protection terms. During the ad hoc group workshops, the approach proposed consisted in creating a group of public, private and institutional greenways. All of the lots in the network could be assigned several urban purposes. The approach selected during the workshops also included ordinary landscapes. A metropolitan body was to be in charge of the natural area network or systems. It was to be made up of representatives both government and community-based groups. The respondents thus had to indicate their agreement with these aspects of the approach selected at the workshop by signifying their interest in the multifunctional nature of the network, ordinary landscapes, and the community's involvement in the organizational procedure. They were also asked to list the rationales by which urban nature should be protected. Respondents could specify, in one way or another, ecological rationales such as the conservation of rare plant species, the health of ecosystems, or the integrity of the natural heritage. They could also quote different social rationales such as accessibility to leisure or recreational areas, conservation of the cultural heritage, and improved quality of life. We were thus seeking to compare their understanding of conservation issues in the Montreal area with the conceptual bases (Table 1) and the conservation strategies discussed at the workshops and included in the report (Table 2). The report appears to not have had much of a long-lived impact on the persons that we met. Little value was given to the compromise during the interviews. That part of the report, which was widely based on landscape ecology, remains rather marginal In fact, the former disciplinary paradigms, i.e. plant biology and landscape architecture, dominated the exchanges.

METHODS

We conducted semi-conducted interview with 20 respondents: eight urban planners or developers, five biologists or ecologists, and three landscape architects. The remaining four respondents consisted of two lawyers, one engineer and one educator. Each respondent was allowed to mention the key elements from each of the conceptual bases of three disciplines and their strategic conservation approach, i.e. plant composition, the objectives of the action taken, and the organizational and planning methods. The responses were not exclusive to one discipline: thus, the eight urban planners could give a positive rating to the elements relating to the other two disciplines. This being said, it is understandable that the respondents should recognize the elements from their own field and perceive them in a positive light. The purpose of the exercise was to show whether the elements of the other fields were also seen in a positive light and, especially, whether the elements of landscape ecology were as well. The aim was to see whether landscape ecology elements were recognized as valid; in short, to determine whether the report's policies were based on true recognition of the validity of applying landscape ecology elements to urban and suburban environments.

In order to systematize the interview contents, it was decided that a correspondence analysis would be carried-out. According to the SAS Institute, correspondence analysis is a weighted component analysis of a contingency table. It is based on a low-dimensional graphical representation of the association between rows and columns represented by a point in Euclidean space determined from cell frequencies (SAS Institute, 1990, p. 616). The responses were thus categorized by discipline and organizational affiliations. The respondents' adherence to each of the three approaches was thus evaluated. For instance, one of the respondents stated that he/she considered it important to preserve ecological biodiversity. An entry was thus made for plant ecology. The content of the interviews was arranged in a table, which allows each respondent's disciplinary culture and organizational affiliation to be cross-tabulated with the concepts and strategies proposed by the three disciplines. The correspondence analysis can then be used to check the results of the transactional analysis and properly define the scope of the compromise reached during the workshops. The results are presented in Figure 2, cross-tabulating the aspects of the statements made with the organizational affiliations and disciplinary cultures.

FIGURE 2 Cross tabulation.



The correspondence analysis reveals a polarization of viewpoints which leaves no doubt as to the fragile nature of the compromise reached during the workshops. In fact, axis 1 represents, on the horizontal plane, the classic opposition between plant biology and landscape architecture. These are the two classic paradigms which have played a critical role in defining the discourse on nature. Biologists and urban planners have few aspects in common other than operating within organizations in charge of managing nature-related issues and implementing conservation practices. This aspect of the analysis puts in opposition, on the right side of the figure, the main variables of natural heritage, rare plant species, plant biodiversity and the health of ecosystems against the concepts of cultural heritage, accessibility to recreational facilities and greenways on the left side of the figure. The vertical axis is structured based on the opposition between the classic paradigms, including both biologists and landscape planners, compared to the new landscape ecology paradigm. Two key variables (landscape formation and connectivity and patch corridor) occupy an exocentric position, taking up 65% of the axis. They are in opposition to the site acquisition variable. This aspect of the analysis brings into play the tension between the two strategies discussed at the workshops, i.e. the acquisition of sites by public authorities for purposes of conservation and the network approach of landscape ecology. An anomaly appears in the results of the correspondence analysis. The concept of humanized biodiversity is associated with the discourse of urban planners and is for the most part disconnected from the other aspects related to landscape ecology. Such a situation can be interpreted based on the fact that the respondents have recognized a principle, namely that the plant composition of urban environments has been altered, but have not adhered to the strategies used to apply such a principle, i.e. the creation of heterogeneous corridors and areas to facilitate connectivity.

It is interesting to note that some workshop participants did not have a background in nature conservation. They were categorized as “other” for data processing purposes. Their attendance was justified by their work with a group involved in defending a specific site, such as an urban forest or shoreline. The site is usually located near their home. They wish to maintain it in its natural state and are asking government authorities to acquire the site. They strongly defended the ecological integrity criterion and showed considerable reserve toward the network approach and landscape ecology concepts. On Figure 3, the “other” variable is adjacent to the site acquisition variable, with both in opposition to the landscape ecology variables.

The correspondence analysis thus confirms, two years after the publication of the report, the return to discipline-based positions. The organizational affiliations follow the same pattern resulting from the biology/urban planning split, except for respondents categorized as “other.” The latter stand out through their fight to preserve a particular site. The aspects of the dominant discourse at the workshops, closely associated with the new landscape ecology paradigm, were only occasionally reiterated during the interviews. This explains why references to landscape ecology are positioned exocentrically on the vertical axis. The workshops served to identify major issues such as landscape protection, the network approach, the metropolitan perspective and public-private management. These issues, which resulted from a type of social transaction, did not seem to be, two years later, on the agenda of the persons interviewed. Each person had returned to his/her traditional position. Furthermore, even the dominant group, which was made up of experts who had proposed the major lines of the solution adopted at the workshops, was no longer referring to the issues in any major way. Two years later, for all the respondents that were interviewed, the idea that the specificity of the urban environment needs to be taken into account is less evident. Lastly, the failure of the compromise signifies a failure of the new landscape ecology paradigm, which has not yet become part of the field of knowledge and know-how of Montreal area conservationists.

DISCUSSION

The recounting of the events that marked the creation of a Quebec policy on protected spaces in urban and suburban environments illustrates the conditions specific to the province of Quebec and to Montreal. It does, however, allow significant conclusions to be drawn for all metropolitan areas in North America. First, one must recognize that the Montreal area has not seen the same developments in this respect as cities such as Chicago or Baltimore have experienced. The concepts of urban forest and greenway, though recognized as being valid by Montreal area experts, do not carry the same weight as elsewhere. The approach used by municipal and provincial government agencies does, however, have a number of innovative aspects, such as the implementation of a form of partnership between the state and community groups in the consultation, planning, and protection of special sites. The creation of the ad hoc task force in fact bears witness to the cooperation between government agencies and community groups. However, there is still some common resistance to bringing up the issue of urban nature protection from an integrated metropolitan standpoint. In this respect, the observations drawn from the Montreal case are enlightening for all those working in similar situations.

First, the social transaction study (Blanc et al. 1992; 1994; Voyé et al., 1996) conducted within the ad hoc task force has shown the major role played by community group leaders. The protection of natural areas is no longer the sole prerogative of government or municipal experts. Universities are no longer relegated to playing just one role, namely that of independent expert armed with incontrovertible knowledge. Today, they are more part of the community by being actively involved in the community groups that work on preserving nature and landscapes. The social transaction study also revealed the imposition strategy that was attempted by an affinity circle that we qualified as dominant. The members of this circle, which is made up of urban planners, have proposed policies that were subsequently retained. However, they have had to deal with the biologists during the workshops and introduce the concept of biodiversity in their proposal. However, they were not able to ensure that the notion of urban biodiversity, which was brought up during the workshops, would be included in the report. Therefore, only a single reference to a disciplinary field, one similar to landscape ecology, was used to set up the terms of a compromise. In this respect, the imposition of a strategy was actually attenuated by concessions, made from both sides, which served to obtain everyone's agreement, including that of the biologists, during the workshops and the drafting of the report. But this agreement did not withstand the test of time, although several of the policies in the report were followed, in particular, the introduction of the status of the human-made landscape in Quebec legislation. However, the same could not be said for the two main recommendations, i.e. the inclusion of the social value of landscapes and the creation of a network of protected areas. The interviews conducted in 2003 in fact show the fragile nature of the compromise that was reached during the workshops in 2001. In short, with respect to metropolitan planning, the social transaction system formed between community-group leaders and government agencies has been characterized by efficiency, openness and intensity during the workshops, but does not extend to the current work of government departments and municipal bodies. Lastly, the coming together of experts and lay people was not made on an equal footing. The ad hoc task force more than anything allowed an affinity circle to be formed by those with long-standing connections while limiting the expression of the lay people.

Second, the fields of expertise that were mobilized during the ad hoc task force's work include well-known disciplines: biology-ecology, urban planning, and landscape architecture. One must recognize that the social transaction led to policies that extend beyond disciplinary boundaries. Once again, agreement with the multidisciplinary policies did not outlast the workshops of the ad hoc task force. The usual divide between natural sciences and the urban planning disciplines was noted subsequently during the interview sessions. The latter

shed light on the considerable difficulty of establishing a common language for defining urban nature and thus justifying the conservation of sites that did not fully meet ecological criteria. This difficulty is also due to the epistemological and methodological fuzziness surrounding the concept of urban nature. It is also due to the intrinsic characteristics of urban nature, i.e. the intense fragmentation of residual areas, the heterogeneity of plant composition, and the magnitude of anthropogenic disturbances. Both biologists and urban planners have difficulty considering implementing measures on spaces that differ in terms of their shape, size, tenure and purpose. This becomes all the more difficult in that the strategy proposed, namely that of greenways and landscapes, would require stepping out of the narrow framework of protected areas with impenetrable boundaries cut off from the surrounding city. This was not a choice backed by disciplinary knowledge recognized by workshop participants; it was the result of compromise, and it included concepts from landscape ecology. This emerging discipline is certainly recognized and plays a role in furthering knowledge of natural spaces altered by human activity. However, this does not make it a discipline that is well represented in Quebec universities, at least not yet, and there are not many professionals in this field in government agencies. This being said, it does not have a content that is specific and applicable to an urban environment. The work of Burel and Baudry (2000) or Forman (1995), for example, does not refer to the urban environment. This reveals a type of inability to simultaneously determine what interests both biologists and urban planners. Urban nature becomes an unthought-of concept: the Montreal case shows, on the one hand, that the high degree of uncertainty surrounding the definitions and notions associated with urban nature is reflected in the implementation and action stages. The idea of urban nature as inconceivable is in fact related to the difficulty of identifying and structuring a theoretical and methodological field specific to urban planning with common standards, criteria and rules that can lead to the creation of a so-called social consensus and thus justify all the efforts required. Urban nature as an unthought-of concept is also related to the possibility of stepping outside the framework of standards developed in plant ecology to justify the conservation of natural sites.

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