The Environmental Assessment and Planning in Ontario Project

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Radical Green Political Theory and Land Use Decision Making in the Region of Waterloo

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Problems have arisen at the intersection of environmental assessment and land use planning in Ontario for two reasons. Established land use planning practices have failed to satisfy growing environmental concerns about individual undertakings and their cumulative effects. And environmental assessment, as an environmentally sensitive approach to planning, now both overlaps inefficiently with some land use planning decisions, and is in some ways attractive for broader application in planning decision making.

These two factors have led to a search for solutions. Some wish to apply environmental assessment requirements more broadly in land use planning decision making. Others favour merging the processes in the relatively small area where environmental assessment and land use planning requirements already overlap. Broader examination may reveal further possibilities.

The Environmental Assessment and Planning Project, initially funded by the Social Sciences and Humanities Research Council of Canada, aims to develop a better understanding of the existing problems and the needs and options for reform. The work completed thus far includes case studies of major controversies and responses to these controversies in Ontario and British Columbia. *Radical Green Political Theory and Land Use Decision Making in the Region of Waterloo* is the report of one of these studies. For other case studies and publications of the project, contact the project coordinator and general editor of the case study series, Dr. Robert Gibson, Department of Environment and Resource Studies, University of Waterloo [rbgibson@uwaterloo.ca].

Radical Green Political Theory and Land Use Decision Making in the Region of Waterloo

Radical green political theory outlines some fundamentals for a sustainable society, but leaves questions about how these might be translated into practice. This study investigates the strengths and limitations of radical green political theory in the context of the Waterloo Moraine land use issue in Waterloo, Ontario. A set of generic land use decision-making criteria was derived from Dobson's (2000) portrayal of ecologism. The capacity of these generic criteria to achieve sustainability was tested against Gibson et al.'s (2005) core decision making criteria for sustainability. The strengths and limitations of a revised set of criteria were explored by applying them to the case of the Waterloo Moraine land use issue. The final set of generic criteria was then used to evaluate Regional and Municipal decision making in the subject land use case.

Ecologism's underlying themes of ecocentrism and anti-anthropocentrism contributed to both the strengths and limitations of radical green political theory in this case. These themes limit radical green political theory's capacity to address the cultural, economic, and structural and procedural factors in land use decision making, but they link the human and non-human components as socio-ecological aspects within a whole system. To become more sensitive to the cultural, economic, and structural and procedural factors in land use decision making, radical green political theorists must begin to focus on their particular orientation towards the micro-scale real life barriers to land use decision making for sustainability. At the same time, the Region might be better equipped to achieve sustainable development through land decision making if it adopted the final generic land use decision making criteria developed by this study.

The Author

This case study was prepared by Tanya Markvart, a graduate in Environment and Resource Studies at the University of Waterloo.

Radical Green Political Theory and Land Use Decision Making in the Region of Waterloo

TABLE OF CONTENTS

Radical Green Political Theory and Land Use Decision Making in the Region of Waterloo

Introduction

Radical green political theory outlines some fundamentals for a sustainable society; *if* and *how* they might be translated into practice has become a matter of much discussion (see Dryzek & Schlosberg, 1999; Eckersley, 2004; Paehlke & Torgerson, 2005). Radical green political theory, therefore, might benefit from studies that focus on its strengths and limitations in the context of contemporary decision making institutions. Research pertaining to the goal of sustainable development proliferated after the concept gained popularity in the late 1980's. Many studies pertaining to the translation of sustainability commitments into practice have focused on natural resource management and planning (eg., Berg & Nycander, 1997; Jensen et al., 2000). Others have stressed the usefulness of sustainability appraisals of development plans, policies, and programs (eg., Smith & Sheate, 2001; Benson & Jordon, 2004). This study focuses on the role that radical green political theory might play in land use decision making to achieve sustainable development. It has three key objectives. First, a set of generic land use decision making criteria is derived from Dobson's (2000) portrayal of ecologism (section 2.1.). The capacity of this generic set of criteria to achieve sustainability is then tested against Gibson et al.'s (2005) core decision making criteria for sustainability (Test #1, section 2.3.). Second, the strengths and limitations of a revised set of generic criteria are explored by applying them to the case specific context of the Waterloo Moraine land use issue in the Region of Waterloo, Ontario (Test #2, section 4.0.). The third objective involves employing the final set of criteria in an evaluation of Regional and Municipal decision making in the Waterloo Moraine land use issue (section 5.0.).

The Waterloo Moraine land use issue emerged in 1985 when the Region's revised Official Policies Plan indicated a need to designate additional lands "Urban" to meet residential housing needs until the year 2011. This prompted five owners of property on the West Side of Waterloo to request an amendment of the "Rural" designation on their lands in the City and Regional Official Plan. The property owners knew that without this amendment no residential development could occur on their lands. Their request sparked a chain of events that culminated in a 1992 ruling by the Ontario Municipal Board to designate the West Side lands "Urban". Soon after this ruling, developers began to submit to the City of Waterloo applications for subdivision approvals.

The subject land use issue involves plans for three residential subdivisions at the westernmost boundary of Waterloo. This rural and agricultural area is characterized by hummocky and rolling hills spotted by fragments of upland and lowland forests. The proposed subdivisions may occupy 132.68 hectares for 1378 to 1618 residential units. They are controversial because they impinge upon environmentally sensitive features of the landscape, including Provincially Significant Wetlands, Environmentally Sensitive Policy Areas, the headwaters of Clair Creek, and the recharge soils of the Waterloo Moraine. The proposed subdivisions are situated on a portion of the Waterloo Moraine, a

736km2 glacial moraine system with underlying aquifers that eventually discharge into the Grand River. The waters of the Moraine are tapped by the Region of Waterloo for the Region's water supply. The case specific details of the subject land use issue are discussed in section 3.0. These case specific details provide some of the material for the second test (section 4.0.).

In performing tests #1 and #2, and by evaluating Regional and Municipal decision making, this study hopes to delineate the components of radical green political theory on which green political theorists might focus in order to strengthen the theory's capacity to achieve the sustainable society. Radical green political theory is just one shade of green political thought. It might be understood in relation to other shades of green political thought, which can be divided into two major groups that indicate their orientation towards decision making. One group advocates centralized authoritarian institutions for environmental problem-solving (see Heilbroner, 1974; Ophuls, 1977; Ryle 1988) and the other group would extend broad participation in the structures and processes employed by democratic institutions. This study is concerned with the latter group (see Dryzek, 1987; Dobson, 2000; Smith, 2003; Eckersley, 2004; Paehlke & Torgerson, 2005).

Both radical and reformist voices can be heard within the democratic strain of green political thought. These "deep" green and "shallow" green voices have ultimately contributed to what Torgerson (1999) labels a green public sphere, an arena of discourse where commentary on everything from participatory democracy to recycling might be transmitted to the administrative realm. For the purpose of this study, a brief description of some of the categorizations of green political thought will clarify the shade of green to which this study conforms.

Dobson's (2000) portrayal of green political thought depicts ecologism as its endoskeleton, bearing the weight of the radical green political agenda. From this standpoint, he distinguishes between "Green" politics, or ecologism, and "green" politics, or environmentalism. Ecologism seeks to transform the whole of society by confronting some of the dominant assumptions and values that support it, while environmentalism aims to alter existing political and economic practices using managerial style strategies and existing institutions. For green political thought to be "Green", then, it must challenge the "political, economic and social consensus that dominates contemporary life" (p. 2). This distinction between Ecologism and environmentalism, or "Green" and "green" shades of thinking, is what permits Dobson to argue that Ecologism exists as an independent political ideology.

Dryzek (1997) inserts some shades of green political thought into a categorization of the various environmental discourses that create the context within which environmental problems are approached. A discourse is "a shared way of apprehending the world" (p. 8) and Dryzek contends that "environmental discourse begins in industrial society, and so it has to position itself in the context of the long-dominant discourse of industrial society…" (p. 12). Environmental discourse essentially challenges the standards of industrialism and seeks alternatives to these standards. According to Dryzek, these alternatives can be reformist or radical, prosaic or imaginative. Prosaic reactions, which may be radical or reformist, seek to solve environmental problems by using the established political and economic norms of industrialized society. A radical prosaic solution to environmental degradation, for example, would be the development of a zero-growth economy. This is a radical solution because it drastically changes the dominant

patterns of the industrial economy, which revolves around growth, but it is a prosaic solution because it works within the established patterns of the industrial economy. Imaginative solutions, which may also be radical or reformist, aim to redefine the political and economic norms of industrialized society, "The environment is brought into the heart of society and its cultural, moral, and economic systems, rather than being seen as a source of difficulties standing outside these systems" (p. 13). The major difference between prosaic and imaginative solutions, then, is that imaginative solutions highlight the interconnections and interdependencies that exist between the natural world and human societies, while prosaic solutions define the environment as something separate from society. Dryzek delineates four major environmental discourses within which various shades of green political thought are categorized: environmental problem solving (prosaic), survivalism (prosaic), sustainability (imaginative), and green radicalism (imaginative).

According to Torgerson (1999), green political thought wavers between "systematic affirmation and systematic negation of the established order" (p. 145). Systematic affirmation—reformism—may involve strategies that seek to make adaptive changes to contemporary, democratic institutions, while systematic negation—radicalism—seeks fundamental transformation of some aspects of society. Radical reformism exists somewhere between radicalism and reformism, and calls for changes that gradually lead to radical change by focusing on the "subtle points of vulnerability in the established order" (p. 146). Torgerson asserts that incremental reformism rejects both radical change and the centralized authority of the state by calling for decision making processes that involve a plurality of stakeholders so that the relationships between civil society and the state are emphasized. He describes incremental radicalism as an even more decentralized approach than incremental reformism: "breaking decisively with the epistemological presuppositions of the administrative mind" (p. 147).

The decision making criteria developed by this study were derived from Dobson's (2000) depiction of ecologism; therefore, they have radical green underpinnings because they reflect ecologism's theoretical resolutions. This study does not, however, reject existing democratic institutions. Rather, it seeks to inform them by outlining some criteria for land use decision making at the regional level which may lead to attention to new considerations and possibly to alternative decision making structures and processes. Eckersley (2004) has undertaken a similar project for national level, liberal democratic institutions. In *The Green State*, Eckersley does not reject existing democratic institutions. Rather, she aims to develop a political theory of the green state as an alternative to the standard liberal state.

The problem of what to do with existing decision making institutions is indicative of the tension that exists between the radical green desire for a complete overhaul of existing social, economic and political practices, and the practical implications of orchestrating such an overhaul. This project does not assume the administrative state must be wholly replaced. The coordinating and planning efforts of the administrative state, however, would be heavily influenced by the radical green agenda. Bartlett (2005) recognizes the dilemma of keeping or disregarding the state in environmental problem solving and suggests that strategies for change should neither accept it nor dismantle it. Instead, we should consider experimenting with social choice mechanisms that enhance the evolution of the administrative mind. Similarly, Dryzek's (2005) support for

deliberative democracy does not entail disassembling the administrative state. He posits that we should figure out which relationship between the state and deliberative democracy would be the most productive. Moreover, he hints that decision making alternatives like deliberative democracy would benefit from a strong administrative sphere. Radicals and reformists, light green and dark green, seem to agree with Dobson (1990) at the end of the day: "if the Green movement is serious about staying Green and creating a sustainable life for us all…then current political strategies may not be sufficient" (p. 170).

Chapter 2 entails the development of the preliminary land use decision making criteria and the first test. Chapter 3 describes the details of the Waterloo Moraine land use issue. Chapter 4 reveals the results of the second test. Chapter 5 entails an evaluation of Regional and Municipal decision making, and Chapter 6 is dedicated to the overall conclusions and recommendations of this study.

Methods

Primary research involved informal meetings with citizens from the Citizens for the Protection of the Waterloo Moraine, a local grassroots organization. These meetings helped delineate the key issues in the Moraine land use case. Region of Waterloo public meetings were observed for a first hand experience of Regional decision making processes. Secondary research included review of published government reports; committee meeting minutes; environmental assessments; subdivision plans; transportation studies; peer-reviewed journal articles from political science journals, environmental management journals, and urban planning journals; and books pertaining to Green political theory. Government documents supported primary research and revealed key issues from the Region's perspective.

This study relied exclusively on Dobson's *Green Political Thought* (2000) for its summary of ecologism and the creation of preliminary generic land use decision making criteria. Dobson's work is an up-to-date response to his earlier editions and it is widely recognized in the literature on green political thought. Gibson et al.'s (2005) core decision making criteria for sustainability were employed for the evaluation of the preliminary criteria (Test #1). This work is a synthesis of the literature on sustainability. It intends to push the concept further into decision making; therefore, it was appropriate for this study. Test #2 involved applying a revised set of generic criteria, based on the results of the first test, to the case specific context of the Waterloo Moraine land use issue. Finally, the final set of generic criteria was then employed in an evaluation of Regional and Municipal decision making in the subject land use issue.

Radical green foundation for generic land use decision making criteria: Ecologism

A set of generic land use decision making criteria was derived from Dobson's (2000) portrayal of ecologism's philosophical foundations (section 2.0.2.), sustainable society (2.0.3.) and strategies for change (section 2.0.4.).

Problems and assumptions

Other depictions of ecologism exist (e.g., Smith, 1998). Dobson's work, however, is most often cited by the group of green political theorists referred to by this project. Secondly, Dobson's account of ecologism has received wide commentary from notable political theorists. Goodin's (1992) reflections on the "green theory of value" and the "green theory of agency", for example, are inclusive of Dobson's (1990) portrayal of the radical green agenda. Lastly, Dobson's most recent editions of *Green Political Thought* (2000, 2006) are, in part, a response to the explosion of literature on green political theory since his first edition was published in 1990. Dobson's work, therefore, reflects the growth most recently experienced by the political ideology of ecologism.

However, there are three key problems associated with employing ecologism as the basis for the criteria for decision making in the Waterloo Moraine land use issue. First, ecologism's critiques and prescriptions are mostly coarse-scale critiques and prescriptions; they are aimed at the overarching trends of contemporary industrialized societies, rather than a particular aspect of a particular contemporary industrialized society. This is because ecologism, as a political ideology, seeks to confront the dominant values and assumptions that extend throughout developed and developing societies. Ecologism, then, does not speak directly to land use issues, nor does it explicitly prescribe structures and processes for decision making for sustainable development at the regional level. One advantage of its broad critiques and prescriptions, however, is that they can be applied to finer scales and they can provide guidance on how we may proceed to resolve a variety of environmental issues.

The second problem with employing ecologism for the purpose of this study is that the ideology includes theories, concepts and practices that are debated within the wider environmental movement. As Dobson (2000) outlines, ecologism's ethical code of conduct, for example, has generated much discussion on the moral and philosophical dilemmas related to giving intrinsic value to the non-human world. The scope of this study, however, does not include a discussion of the complex details of each debate in the literature associated with the various components of ecologism. Rather, this study highlights ecologism's orientation towards these components and it employs ecologism's unique position to design the criteria for decision making in the Waterloo Moraine land use issue.

The third problem is related to Dobson's (2000) purpose in writing *Green Political Thought*. The underlying impetus of his work is to establish ecologism as a political ideology on its own. Dobson, then, attempts to distinguish between ecologism and environmentalism, and the political ideologies of liberalism, conservatism, socialism, and feminism. This purpose circumscribes the content of the book so his discussions of the various components of ecologism may not always reach to the level of depth required for this study. Nevertheless, Dobson provides a concise outline of the central critiques and prescriptions of ecologism which are required for this study. Imbedded in these critiques and prescriptions are the central tenets of ecologism, some of which will underpin the land use decision making criteria designed for the Waterloo Moraine land use issue.

Finally, this study assumes that deriving the decision making criteria from ecologism is sufficient for uncovering some of the practical strengths and limitations of radical green political theory. This assumes a direct connection between the ideology and

the theory. Dobson (2000) has argued that ecologism is the basis for radical green political thought. He has also demonstrated that the radical substance of ecologism may be lost when it is translated into practice, for instance, for the purpose of the success of green political parties. This has led Dobson to recognize the potential for radical green political thought to possess both a private and public face. The public face may need to present a watered down version of the private face in order to relate to the general public. But the private face remains loyal to the radical aims of ecologism. This necessity to be two-faced attests to the practical limitations of ecologism. This study, however, is not concerned with how political parties employ green political theory. Nor is it concerned with the type of green political theory utilized by broad political agendas. This study is interested in radical green political theory for the purpose of designing decision making criteria for the Waterloo Moraine land use dispute. This study, then, assumes that ecologism and radical green political thought are tightly connected.

The set of generic decision making criteria was derived from three key chapters in Dobson's (2000) *Green Political Thought*: *philosophical foundations, the sustainable society, and strategies for green change*. These three chapters comprise the core of Dobson's discussion of the critical components of ecologism. The chapters preceding these are introductory and the chapters following these are dedicated to exploring ecologism in relation to other ideologies. The components of ecologism described by these three chapters are discussed in detail in order to later explore the full practical strengths and limitations of radical green political theory in the context of the Waterloo Moraine land use issue. Only the components with particular relevance for land use planning were addressed by this study. Dobson's discussion of "Trade and travel" (p. 89-91) and "Work" (p. 91-99), for example, were excluded from this study.

The philosophical foundations of ecologism

Ecologism is essentially concerned with the relationship between human beings and the non-human natural world. One of its core beliefs is that our "social, political and economic problems are substantially caused by our intellectual relationship with the world and the practices that stem from it" (p. 36). Dobson asserts that ecologism is a political ideology different from other political ideologies especially because it professes a particular set of reasons for why we should care for the environment—radical ecological reasons. To defend these reasons, ecologism has armed itself with twentieth century physics, the science of ecology, and the philosophy of deep ecology.

Ecologism is aligned with most green thinkers who would reject the seventeenth century worldview influenced by the modern science conventionally ascribed to Francis Bacon, René Descartes, and Isaac Newton. This worldview has dominated industrialized societies for the past 300 years. For greens, it has led to a faith in technology as a force for environmental problem solving and infinite economic growth—an ecologically irrational system based on unsustainable rates of production and consumption. Briefly, the seventeenth century forms of thinking, which break things apart to study them in isolation, are rejected for an understanding of how things are interconnected and how they interact with each other—holism as opposed to reductionism. The belief that the physical universe is like a mechanical contraption comprised of submissive matter is discarded for a worldview informed by subatomic physics, which reveals the physical universe to be comprised of fields of probability "in which 'particles' have a tendency to

exist" (Dobson, 2000, p. 39). The nature of these particles is not understood by isolating them from each other. Rather, their nature is understood by focusing on how the parts interact. Moreover, unlike seventeenth century science, which asserts that the secrets of the universe can be known only through an independent and objective observer, quantum physics demonstrates that the observer "is inextricably a part of it" (Dobson, 2000, p. 39). The perspective of the observer, then, with cultural biases intact, has an impact on her interpretation of reality.

According to Dobson (2000), the twentieth century's scientific understanding of the universe has a particular set of implications for ecologism. Ecologism, for example, rejects discrete atomism's hierarchical arrangement of the world and instead embraces "the 'bootstrap' interpretation of particle physics…" (p. 39). This entails the view that all of the particles that comprise the universe are equally important. By extension, then, Ecologism professes egalitarianism. Moreover, the twentieth-century's emphasis on the importance of the relationships and the interactions between particles at the subatomic level has led ecologism to adopt an understanding of the world from a systems point of view. Systems thinking emphasizes the interconnections and interdependencies that exist among ecological, biophysical, and human systems at various temporal and special scales (see Miller, 1998; McCarthy, 2006). One recent exploration of systems thinking focuses on how concepts from complex open systems might be applied at the landscape scale to biosphere reserves in Ontario (see Francis, 2005).

The science of ecology provides ecologism with lessons from nature that underpin its prescriptions for social and political arrangements. Ecology is concerned with the way plants and animals interact with each other and their surrounding environments. The inter-relationships, interdependencies and interconnections of the non-human natural world are emphasized. Plants, animals, and their environments are understood as interacting parts of a system rather than discrete entities that are spatially and temporally independent and isolated from one another. The similarities between the science of ecology and twentieth-century physics, as demonstrated above, clearly make them allies against a hierarchical, atomistic understanding of the world. The ecological principle of diversity, for example, supports toleration, resilience and democracy; interdependence supports equality; and longevity supports tradition. Ecologism's themes of egalitarianism and anti-anthropocentrism are derived from the ecological principle of interdependence. Both themes are carried into ecologism's ethical theory, which includes a code of conduct and a sate of being.

Ecologism's ethical theory is underpinned by the philosophy of deep ecology. The term "deep ecology" was coined by Arne Naess, a Norwegian philosopher, in the early 1970s. Naess distinguishes between the "shallow" and "deep" ecology movements: shallow ecology advocates care for the environment because it has instrumental value for human beings, while deep ecologists assert that we should care for the environment for the sake for the environment itself. This notion of care for the environment for its own sake is what Dobson (2000) calls Naess' principle of intrinsic value and it undergirds ecologism's ethical code of conduct. Following Naess' principle of intrinsic value, the boundaries of ecologism's ethical community are extended around species and ecosystems as well as human beings. Ecologism's environmental ethic, then, applies to the whole environment, rather than just to humans or just to animals. It also subscribes to

the principle of biospherical egalitarianism—total equality between natural parts (people, other animals, plants, rocks, etc.).

Dobson (2000) highlights many problems associated with both the principle of intrinsic value and biospherical egalitarianism. These problems involve conflicts that arise between the well-being needs of the different "ecological subjects" within the whole environment. These conflicts cannot be resolved within the framework of intrinsic value or biospherical egalitarianism. One possible solution to conflicts between ecological subjects, for example, is the construction of a "hierarchy of valued entities and collections of entities" (p. 43). This involves lending more moral weight to certain entities and collections of entities than others, depending on the valued attributes they possess. Some entities, then, might possess more intrinsic value than others; therefore, they are not equal. Despite these problems, however, both the principle of intrinsic value and biospherical egalitarianism are indicative of ecologism's desire to legitimize a non-instrumental relationship with the biophysical world. Dobson hopes they might "…underpin responsible behaviour towards the non-human natural world" (p. 45).

The philosophy of deep ecology supports ecologism's prescription for an ethical state of being. Key to this ethic is the hope that the cultivation of an ecological consciousness, which connects people to an understanding of how their behaviour affects the larger world, will be the foundation for a more ecologically sensitive ethic with more ecologically sensitive forms of behaviour. This type of consciousness involves a "sense of self that extends beyond the individual understood in terms of its isolated corporal identity" (Dobson, 2000, p. 47) and Dobson asserts that it may be cultivated through "the widest possible identification with the non-human world" (p. 47). Deep ecology, then, promotes a consciousness of identification with the non-human world as the preferable foundation for a new code of conduct. Its adherents hope that this new code of conduct will shift the onus of justification from those who want to preserve the non-human world to those who wish to interfere with its preservation.

The final component of the philosophical foundations of ecologism to be discussed here is the centrality of the principle of anti-anthropocentrism. Dobson (2000) derives his understanding of anthropocentrism from Hayward (1997) who posits that "according to the ethical criticism, anthropocentrism is the mistake of giving exclusive or arbitrarily preferential consideration to human interests as opposed to the interests of other beings" (Dobson, 2000, p. 51). Anti-anthropocentrism and ecocentrism then, involve valuing the non-human world for reasons beyond those that are instrumental. Dobson highlights the dangers associated with an extreme biocentrism; it risks being misanthropic, which may lead to violent tactics. Ecologism does not embrace this extreme. Rather, it seeks to reintroduce humans onto the green political agenda—proof of ecologism's desire to be practical. In this manner, it recognizes that humans and human systems are both part of the problem and the solution.

Dobson (2000) distinguishes between a weak, or "human-centred" and a strong or "human-instrumental" understanding of anthropocentrism. He asserts that both are important for the agenda of ecologism. For example, an idea or concept, etc., may be human-centred but this does not make the idea or concept, etc., essentially human-instrumental. This is because the former is unavoidable for humans; we cannot create any system apart from the context of our social and political cultures. Our desire to care for the non-human world, then, is human-centred simply because it is a human idea, but

our desire to care for the non-human world as part of a deep respect and admiration for all creatures is not necessarily human-instrumental. According to Dobson, then, "it is this factor that links even the search for intrinsic value with anthropocentrism" (p. 55). But Dobson is referring to weak or "human-centred" anthropocentrism here. According to Dobson's logic, the deep ecological notion that the non-human world has intrinsic value is essentially human-centered but it is not human-instrumental.

The sustainable society

The radical green prescription for change involves a particular set of ingredients for a sustainable society. This sustainable society is underpinned by the limits to growth thesis, which is grounded on the belief that the Earth is a finite system:

> Amid the welter of enthusiasm for lead-free petrol and green consumerism it is often forgotten that a foundation-stone of radical green politics is the belief that our finite Earth places limits on industrial growth. This finitude, and the scarcity it implies, is an article of faith for green ideologues and it provides the fundamental framework within which any putative picture of society must be drawn (Dobson, 2000, p. 62).

The limits to growth thesis to which radical greens subscribe arose in part from the Club of Rome's *Limits to Growth* reports, the first of which was published in 1972. The 1972 report reveals the results of a computer model designed to explore the impacts of five major trends that are exponential by nature: accelerating industrialization, rapid population growth, widespread malnutrition, depletion of nonrenewable resources, and a deteriorating environment. Researchers ran the model multiple times according to a mix of variables related to these trends. Each time the simulation led to global collapse for one reason or another, depending on the variables driving the model. The first run, for example, which left things as they are, led to collapse because of nonrenewable resource depletion. The second run, which corrected the nonrenewable resource problem, ended in collapse because of pollution due to increased industrialization. The major conclusion of this report, therefore, was bleak: if these trends in growth continue at present rates, the Earth's limits to growth will be reached within one century.

The limits to growth thesis supports the fundamental green belief that the Earth is finite and that it possesses real limits to growth. These limits and their associated scarcity define key parameters of a distinct, radical green sustainable society. Such a society, according to Dobson (2000), also contains a particular set of political-institutional arrangements and social and ethical norms. In part, they stem from the dark-green claim that certain ways of living are more sustainable than others. First and foremost, the sustainable society prescribed by ecologism is democratic and Dobson leads us through this society from the perspective of the fundamental green urge to reduce consumption. From this perspective, the principal aspects of the radical green Utopia unfold: the theory of need, recommendations for population levels, attitudes towards technology, sustainable sources of energy, and the self-reliant community.

The need to reduce consumption is a consequence of the radical green argument for a decrease in "throughput" (Daly, 1992, p. 36). According to Dobson (2000), the components of throughput include "resource depletion, production, depreciation (involving consumption) and pollution" (p. 77). For radical greens, the consumption

problem is paramount in industrialized societies because it exacerbates the other components of throughput. If consumption is reduced, a reduction in the other components of throughput will follow. For ecologism, reducing consumption eventually leads to the development of a theory of need, a controversial undertaking because of the difficulty in distinguishing between needs and wants, and developing a universal definition of needs and wants. A potential settling of these challenges might be found in Dobson's recognition that needs and wants are embedded in cultural contexts; therefore, they are affected by the dynamics of cultural specifics. Dobson navigates around the various debates related to the theory of need by stating that, overall, the radical green emphasis on reduced consumption eventually calls the distinction between needs and wants into question and this questioning becomes a fixed "intellectual feature" (p. 80) of the sustainable society. Overall, the aim is to decide what we can do without.

Reducing consumption significantly is likely to involve reducing the number of people on the planet, another contentious green idea. This desire for population control is firmly grounded in the fact that present and future population levels are unsustainable. That said, greens recognize the inadequacy of adopting a simplistic plan for across-the-board reductions (Dobson, 2000, p. 81); certain countries consume more than others and certain areas of the world are more populated than others. Additionally, there are disagreements over exactly how many people the Earth can sustain and what to do with the excess. In response to what to do with the excess, greens assert that population control should be negotiated rather than imposed. Radical green strategies for population control, for example, include tax breaks for families with fewer than two children and equal opportunities for women, just to name a few.

Radical greens are highly critical of the "technological fix" and according to Dobson (2000), "wholehearted acceptance of any form of technology disqualifies one from membership of the dark-green canon" (p. 84). This aversion towards modern technology stems from the fundamental belief that no amount of technological wizardry will allow humankind to overcome the problems associated with exponential growth. In other words, technological solutions will not permit infinite growth in a finite system. Technology may only prolong the inevitable or transfer our environmental problems from one area to another. The radical green position, then, holds that societies should adjust their social practices to the natural limits that surround them. The dark-green principle of intrinsic value lends strength to the dark-green aversion to faith in technology because it is believed that some technological devices detract authenticity from the natural world by changing it. Likewise, the dark-green goal to consume less extends to the anti-technological fix argument the option of choosing to do without certain types of technology. Dobson is quick to assert, however, that although radical greens prefer moral solutions and changes in attitude and behaviour, their general attitude towards technology is one of uncertainty and precaution. The use of one technological device or another, therefore, depends on the kind of technology in question, the processes involved in its production, the potential for participative human control, and the associated impacts on the environment. Overall, the radical green orientation towards technology reflects its unwavering concern with the finite capacity of the Earth. This narrow focus brings to the foreground of the technology debate the dark-green push for an overall reduction in consumption as the best solution to the absolute scarcity of resources associated with the limits to growth thesis.

Reducing energy consumption is central to the dark-green solution to exponential resource depletion. The dark-green sustainable society would rely on renewable energy resources and energy conservation. Although renewable energy sources utilize innovative technologies, which may be costly and polluting at the manufacturing phase, they are preferred because they are less damaging to the environment. Moreover, they may be more suitable for the decentralized, self-reliant communities advocated by radical greens. Ideally, these small communities would produce energy themselves rather than rely on large corporations or other institutions for their power supply.

Small, decentralized, self-reliant communities are key components of the dark-green answer to the political-institutional implications of the sustainable society. According to Dobson (2000), the concept of bioregionalism is the most ecologically correct framework within which these communities might be organized. Central to the concept of bioregionalism is the principle of living according to the ecological characteristics of the place where we live:

> The limits of its resources; the carrying capacity of its lands and waters; the places where it must not be stressed; the places where its bounties can best be developed; the treasures it holds and the treasures it withholds—these are the things that must be understood…That, in essence, is *bioregionalism*. (Sale, 1985, p.42)

According to Sale (1985), then, bioregionalism can be defined as a region governed by nature rather than legislature. Living bioregionally involves identifying bioregional boundaries. Individuals would be members of communities within those boundaries. Understanding the bioregional paradigm, however, is much more complex and Sale begins to walk his readers through this paradigm by highlighting the key differences between it and the dominant paradigm of industrialized societies.

Briefly, according to Sale (1985), the bioregional paradigm and the dominant paradigm of industrialized societies differ in four key aspects: scale, economy, polity, and society. Scale is related to the ecological characteristics of a particular region and populations would be described according to the communities within those regions. This is contrary to the industrio-scientific paradigm, where scale is defined through legislative boundaries, e.g. provinces and nations. The bioregional economy emphasizes conservation, stability, self-sufficiency, and cooperation, while industrialized economies emphasize exploitation, change and progress, globalization, and competition. The political organizational framework emphasized by Sale's depiction of the bioregional paradigm is decentralized, reciprocal, and in favour of diversity, while the industrio-scientific paradigm prefers centralization, hierarchy, and uniformity. Lastly, the social relationships advocated by Sale's depiction of the bioregional paradigm—including those within and between bioregional communities—are characterized by symbiosis, peaceful evolutionary adjustment, and division as a method of organizing manageable communities. Conversely, the industrio-scientific paradigm emphasizes polarization, growth and violence, and monocultures. One reason for the differences between these two paradigms is that bioregionalism is informed by the science of ecology, while the industrio-scientific paradigm is informed by the discrete atomism passed down from the scientific tradition of the sixteenth and seventeenth centuries.

Radical green strategies for change

This study is concerned with the practical implications of radical green political theory in the context of the Waterloo Moraine land use issue; it aims to contribute knowledge to the predicament that exists within ecologism and green political theory of how to get from here to there. This predicament as a weakness of ecologism; although it is a classic ideology in that it contains both a critique of present socio-political arrangements and a prescription for the future, there has been little thinking, until recently, on how to achieve the ends it desires. Nevertheless, ecologism does contain strategies for social change and it should be stressed again that these strategies are democratic.

A major role of green movements is to influence the legislative process through lobbying elected political representatives. According to Dobson (2000), then, "at this level the movement's prescriptions rely extremely heavily on operation within the liberal-democratic framework" (p. 125). But at this point, a major problem arises for radical greens. The contentious issue is whether radical green ends can be realized through contemporary democratic institutions. Many radical greens believe that their vision for the sustainable society cannot be realized through current political institutions because they are influenced by many of the strategies and practices that radical greens aim to replace. Dobson describes the Western world's political institutional principle of representative democracy as one such practice that radical greens would replace with participatory democracy—decision making that is inclusive of the stakeholders involved in a specific issue. The exclusive nature of the representative form of government, according to radical greens, cannot produce the inclusive ends prescribed by the radical green agenda. The activities of green parties in the parliamentary system, then, risk watering down the radical green agenda to the point of dilution beyond recognition and Dobson provides many examples of this potential. However, he also presents a possible route around this problem by reminding us that the radical green agenda is such that not all of its prescriptions for social change can be met at once and so it is better to bring about a few changes through existing political institutions than none at all. Overall, the point here is that radical green strategies do include liberal-democratic political institutions, but they risk severely compromising the radical green agenda. Other strategies include a prescription for a particular sort of lifestyle. This involves a change in consciousness and behaviour and it reflects ecologism's belief that radical change requires more than just political solutions—it also entails a spiritual element: "…the proper territory for action is the psyche rather than the parliamentary chamber" (Dobson, 2000, p. 133). Dobson highlights the positive and negative aspects of the lifestyle strategy. Positive aspects, for example, may include changes in behaviour that are more environmentally friendly, such as recycling, caring about what you buy and where you buy it, and choice of transportation. This type of personal transformation and its associated behavioural patterns can bring about more sustainable community living in which people are more sensitive to their ecological surroundings: "More bottles and newspapers are recycled, more lead-free petrol is bought, and fewer harmful detergents are washed down the plughole" (Dobson, 2000, p. 131). But changes in attitude and behaviour do not necessarily heed the warnings of the limits to growth thesis espoused by ecologism. Buying goods made from recyclable materials, for example, does not necessarily lead to changes in the ecologically destructive patterns of production and consumption. And by no means can a shift in attitude bring about the radical changes

sought by ecologism, although they may begin to lay the groundwork that is required for the acceptance of some of them.

Community living as a new social formation is central to ecologism's vision of the sustainable society. Community strategies for change involve care for the well-being of the community rather than just the individual, and the decentralized community construct is seen as the ideal institutional context for bringing about practices that are environmental sustainable. But, as Dobson (2000) highlights, community living, similar to lifestyle changes, cannot alone bring about the sustainable society. This is because communal living that is apart from the prevailing culture does not necessarily oppose the prevailing culture; the trend is that eventually these types of communities are absorbed by conventional society.

Community living and lifestyle strategies face another challenge—the problem of persuasion. How do you convince people to change? This problem has prompted ecologism to shed its Utopian universalism, which professes that because environmental problems are global they will affect everyone and so everyone should be interested in living sustainably. This is obviously not the case on a planet where, for example, profits are to be made from ongoing environmental degradation. In other words, not all classes will want to usher in a sustainable society. Dobson (2000) derives his solution to this problem by suggesting that radical change might be forced by a class that is dedicated to the universal messages of ecologism and its vision of the sustainable society. This class is one that is already displeased with the dominant paradigms of contemporary society and already engaged in sustainable living. He points to the unemployed as one such marginalized group or agent for green political objectives.

The above radical green strategies for change are derived mostly from theoretical conjecture and so their utility requires further study. The development of a class that will champion the ideals of the sustainable society, for example, is a fantasy that might only be dreamed of in retrospect of historic social movements. Radical greens can only hope that such a class of dedicated green activists will rise from the fringes of the unemployed, and if they do, radical greens can only hope that they will adopt ecologism's flavour of the sustainable society.

Preliminary generic land use decision making criteria derived from ecologism

A preliminary set of generic land use decision making criteria was derived from Dobson's (2000) portrayal of ecologism (above). The strengths and limitations of this preliminary set of criteria were evaluated against Gibson et al.'s (2005) core decision making criteria for sustainability (Test #1).

Preliminary generic land use decision making criteria

Ecologism's philosophical foundations centre on a worldview that is underpinned by the science of ecology. This entails understanding that humans are part of a complex web of inter-relationships, interdependencies and interconnections with the non-human world. Dobson (2000) stresses the significance of this understanding as a departure from an atomistic worldview and a turn towards understanding the world through a systems perspective. Land use decision making, therefore, must employ a systems understanding of the natural world, underpinned by the principles of ecology.

Dobson highlights three ecological principles that support this first criterion: diversity, interdependence and longevity. Diversity refers to the number of species that comprise a given area, driven by colonization and extinction (Anderson & Wait, 2001; Marzluff, 2005). Diversity may also refer to human cultures; therefore, the principle of diversity refers to both ecological and human social systems—socio-ecological diversity. The literature asserts that habitat loss and fragmentation associated with land conversion can severely diminish the capacity of a given area to support its original inhabitants, leading to loss of biodiversity and extinction (e.g., Collinge, 1996; Jacquemyn, Butaye & Hermy, 2003; Rickman & Connor, 2003). Moreover, the biodiversity of a given area has been associated with the resilience of ecosystems (Epstein, Bak, & Rinkevich, 2003; Moretti, Duelli & Obrist, 2006). The systems approach, therefore, must be oriented towards maintaining the socio-ecological diversity of a given area. Ecological monitoring may be essential to achieve this goal (Thompson, 2006; Brack, 2007; Magnussen, Smith & Uribe, 2007).

The second principle, interdependence, refers to the complex inter-relationships and interconnections that exist within and between the systems of a given area. These can be non-human ecological, and human social, economic and political interdependencies. The literature pertaining to landscape ecology emphasizes the temporal and spatial nature of these interconnections (Li, 2000; Wiens, 2002; Botequilha-Leitao & Ahern, 2002). The ecological reality is that a change to one component of a system may have an adverse or positive impact on another component of another system in the immediate, near or far future. A systems understanding of socio-ecological arrangements recognizes how these arrangements interact with each other in time and space. The ecological principle of diversity, together with the principle of interdependence, then, requires that the systems approach recognize and respect these interdependencies in order to maintain diversity. The science of landscape ecology may strengthen the efficacy of the systems approach to achieve this goal.

The third principle, longevity, refers to the ability of an ecosystem to function for the long term. The literature on sustainable development reminds us that without long term ecosystem integrity, we cannot have healthy, functioning socio-economic and political systems for the long term (see Gibson, 2001; Alfsen & Greaker, 2007). The systems approach, therefore, must be oriented towards protecting the longevity of the socio-ecological systems involved in each case.

Dobson highlights the chief importance of the ecological principle of interdependence to ecologism's ideology. He asserts that this principle has led ecologism to profess egalitarianism, including the equal status of all species. All of the phases and structures and processes of land use decision making, therefore, must be oriented towards inclusive and equal consideration and engagement of both human and non-human parts of the systems in each case. Human and non-human subjects, therefore, must be represented as interdependent, socio-ecological units during all phases of decision making.

Representing both the human and ecological components of a system as socio-ecological units recognizes their intrinsic value and equal status. This type of representation, which encourages the participants in the land use decision making process to recognize the interconnections and interdependencies between human and ecological systems, works to fulfill four different but overlapping aspects of ecologism. First, it works to extend the moral community around non-humans, which is a major aspect of

ecologism's ethical theory. Second, it fosters the ecological consciousness espoused by ecologism's ethical state of being. Third, this type of representation works towards the development of ecologism's preferred, ecological lifestyle. Fourth, it leads to ecologism's preference for decentralized political structures and processes. Finally, it works towards the well-being of entire human and ecological communities, as opposed to just individual human beings.

As previously discussed, conflicts may arise between the well-being needs of the different socio-ecological units of a particular system. Moreover, one socio-ecological unit may be more important than another for the well-being of the entire system. These conflicts may be exacerbated by land use decision making issues. Similar to Dobson (2000), Gibson et al. (2005) recognize that conflicts, which inevitably lead to compromise, may arise between the valued components of an ecosystem during the assessment process. To ensure that these conflicts do not sacrifice the goal of sustainable development, they developed a set of trade off rules (p. 122-141) to guide decision making during times of conflict and compromise. Dobson's portrayal of ecologism's ethical code of conduct (p. 40-46) provides material for a similar trade off rule for this second criterion: the onus of justification will shift from those who want to preserve the non-human world to those who wish to interfere with its preservation. During times of conflict and compromise within the land use decision making process, therefore, the onus of justification must be placed on those participants who wish to interfere with the maintenance of ecological diversity, the respect of temporal and spatial interdependencies within and between socio-ecological systems, and the protection of the longevity of the socio-ecological systems involved.

The principle of anti-anthropocentrism is central to the ideology of ecologism. Still, Dobson recognizes that humans cannot possibly escape the perceptual confines of anthropocentrism. We can, however, make decisions that are both human-centred and not human-instrumental. Human-centred, yet not human-instrumental decision making would lead towards ecologism's desire for the development of an ecological consciousness, which stems from its notion of care for the environment for the sake of the environment itself. Land use decision making, therefore, must work towards outcomes that are not human-instrumental.

Ecologism's prescription for a sustainable society is underpinned by the limits to growth thesis. Central to the limits to growth thesis is the notion that the earth possesses real limits to growth. Land use decision making, therefore, must consider the carrying capacity of immediate and surrounding ecological systems so that carrying capacity is not exceeded. This criterion entails the consideration of appropriate population levels, appropriate land uses and appropriate levels of resource extraction and consumption for a given area. Ecologism's preference for bioregionally defined, small, decentralized, self-reliant communities is linked to this criterion because bioregionalism is the believed to be the most ecologically correct framework within which these communities might be organized. This involves living according to the ecological characteristics, including limits to resources and carrying capacity, of the place where we live. Land use decision making, therefore, must work towards the development of small, decentralized, self-reliant communities that are bioregionally defined.

The sustainable society is characterized by the belief that technological innovation will not permit infinite growth in a finite system. Ecologism's general attitude towards

technology is one of uncertainty and precaution. During all phases of decision making, therefore, decision-makers must take a precautionary approach to the use of technology in land use matters. Land use conflicts may also entail disagreements over particular aspects of the final use of a particular area; therefore, a precautionary approach to the use of technology must be applied throughout the land use decision making process, including pre-construction, construction and post-construction. This criterion may require an approach to the use of technology that is similar to the approach taken to invasive species (see Simberloff, 2001; Reichard & Hamilton-434folder); a combination of black lists and white lists may be appropriate for a precautionary approach to technology. Box 1 below summarizes the preliminary generic land use decision making criteria derived from the discussion above.

Box 1. Summary of preliminary, generic land use decision making criteria derived from Dobson (2000)

Land use decision making must adopt a systems approach that is oriented towards maintaining socio-ecological diversity, respecting the temporal and spatial interdependencies within and between socio-biophysical systems, and protecting the longevity of the socio-biophysical systems involved in each case.

All of the phases, structures and processes of land use decision making must be oriented towards inclusive and equal consideration, engagement, and representation of the socio-biophysical units in the systems involved in each case.

On matters of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of socio-ecological diversity, respecting the temporal and spatial interdependencies within and between socio-biophysical systems, and the protection of the longevity of the socio-biophysical systems involved.

Land use decision making must work towards outcomes that are not human-instrumental.

Land use decision making must work towards the development of small, decentralized, self-reliant communities that are defined by bioregional boundaries and respect the limits of immediate and surrounding socio-ecological systems so that the carrying capacity of a given area is not exceeded by land use, population level, and resource consumption and extraction.

During all phases of land use decision making, decision makers must adopt a precautionary approach to the use of technology in land use matters, including pre-construction, construction, and post-construction phases.

Sustainability

The practical strengths and limitations of the above criteria were tested against Gibson et al.'s (2005) sustainability assessment criteria. Gibson et al. recognize the vastness of the

literature on the concept of sustainability and the many ways that the concept has been interpreted and practiced throughout the world. For the purpose of evaluating the above generic land use criteria, this study followed Gibson et al.'s concept of sustainability; the essentials that Gibson et al. chose for the definition of this concept are underpinned by their intention to delineate "those that lie at the core of the idea and that should inform its application anywhere" (p. 59). The universal quality of their depiction of sustainability, therefore, is appropriate for this study's evaluation purposes. Moreover, their portrayal of sustainability is, in part, a reaction to the challenges previously and currently faced by the practice of environmental assessment. In the context of these challenges, Gibson et al. attempt to clarify the concept of sustainability and then push it further into decision making. Box 2 depicts Gibson et al.'s "…essentials of the concept of sustainability" (p. 62).

Box 2. The essentials of the concept of sustainability.
(Gibson et al., 2005, p.62)

"The concept of sustainability is:

- a challenge to conventional thinking and practice;
- about long-as well as short-term well-being;
- comprehensive, covering all the core issues of decision making;
- a recognition of links and interdependencies, especially between humans and the biophysical foundations for life;
- embedded in a world of complexity and surprise, in which precautionary approaches are necessary;
- a recognition of both inviolable limits and endless opportunities for creative innovation;
- about an open-ended process, not a state;
- about intertwined means and ends—culture and governance as well as ecology, society and economy;
- both universal and context dependent".

The above depiction of sustainability underpins Gibson et al.'s (2005) core decision-making criteria for sustainability. This study employed these core criteria in order to test the practical strengths and limitations of the preliminary land use decision making criteria (Box 1). The aim was to examine the preliminary, generic land use criteria for sustainability gaps, which may indicate where the ideology of ecologism and green political theory may fall short of achieving their goals. Box 3 presents Gibson et al.'s core decision making criteria for sustainability.

Box 3. Core decision making criteria for sustainability.
(Gibson et al., 2005, p. 115-117)

Socio-ecological system integrity:
Build human-ecological relations to establish and maintain the long-term integrity of socio-biophysical systems and protect the irreplaceable life support functions upon which human as well as ecological well-being depends.

Livelihood sufficiency and opportunity:
Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity.

Intragenerational equity:
Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor.

Intergenerational equity:
Favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.

Resource maintenance and efficiency:
Provide a larger base for ensuring sustainable livelihoods for all while reducing threats to the long-term integrity of socio-ecological systems by reducing extractive damage, avoiding waste and cutting overall material and energy use per unit of benefit.

Socio-ecological civility and democratic governance:
Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices.

Precaution and adaptation:
Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise and manage for adaptation.

Immediate and long-term integration:
Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.

Test #1: Evaluation and discussion of preliminary generic land use decision making criteria

In order to be practical for the purpose of achieving sustainability, the preliminary, generic land use decision making criteria must, at a minimum, fulfill Gibson et al.'s (2005) decision making criteria for sustainability in Box 3. Each of the generic land use criteria derived from ecologism is discussed in relation to these criteria.

Socio-ecological system integrity

"Build human-ecological relations to establish and maintain the long-term integrity of socio-biophysical systems and protect the irreplaceable life support functions upon which human as well as ecological well-being depends" (Gibson et al., 2005, p. 115).

Altogether, the preliminary, generic land use criteria fulfill this criterion. Building socio-ecological relations to achieve the above goal requires that the participants involved in decision making adopt an ecological consciousness. It has been demonstrated that the ideology of ecologism entails this vision. Firstly, ecologism's ethical state of being requires the cultivation of an ecological consciousness as the foundation for more ecologically sensitive forms of behaviour and ecologism's ethical code of conduct extends the boundaries of the ethical community around whole systems, including human and non-human entities. This reflects the type of human-ecological relations suggested by Gibson et al.'s (2005) first criterion, above. Secondly, ecologism emphasizes the interdependencies and interconnections between human and non-human systems; therefore, when developing land use criteria underpinned by ecologism, it is possible to speak of socio-ecological systems, or socio-biophysical systems. It is additionally possible to represent the parts of these systems as socio-biophysical or socio-ecological units. Thirdly, ecologism's preference for small, decentralized, self-reliant communities organized around the ecological characteristics and carrying capacity of the land work towards building the type of human-ecological relations implied by this criterion. Finally, it has been demonstrated that many of ecologism's prescriptions for political and social arrangements and many aspects of its philosophical foundations are informed by the principles of ecology; therefore it is possible to speak of the longevity or integrity of socio-biophysical systems.

Livelihood sufficiency and opportunity, intragenerational equity, intergenerational equity

"Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity" (Gibson et al., 2005, p. 115).

"Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor" (Gibson et al., 2005, p. 115).

"Favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably" (Gibson et al., 2005, p. 116).

The preliminary, generic land use criteria do not fulfill these criteria. Firstly, although biospherical egalitarianism is central to ecologism's ethical theory, ecologism's ethical code of conduct and state of being are oriented towards the cultivation of responsible behaviour towards the non-human world for reasons that are not human-instrumental, rather than a fair distribution and sustainable use of resources, recognizing the disparities between the rich and poor. Secondly, although ecologism's call for reduced and appropriate consumption requires that we distinguish between needs and wants, ecologism's theory of need falls short of extending beyond the arguments surrounding the difficulties of delineating a universal set of needs. Nowhere does Dobson's portrayal of ecologism speak of "sufficiency and opportunity" or "equity" as

the ideal end point of its theory of need or its ethical code of conduct and state of being. Thirdly, although ecologism can speak of maintaining and protecting socio-biophysical longevity, diversity and interdependence, it does not explicitly reserve a space for the consideration of the capability of future generations to live sustainably. Future generations and sustainability are implied by ecologism's adherence to these ecological principles. But the lack of explicit recognition of future generations of humans emphasizes ecologism's bias towards the non-human world. Ecologism's anti-anthropocentrism, then, underpins many of the above criteria, most notably the criteria that explicitly requires land use decision making to work towards outcomes that are not human-instrumental. Altogether, this finding reflects an inherent imbalance within the ideology between human and non-human interests; the scale is tilted towards protecting the non-human world.

This imbalance is significant if ecologism wishes to defend itself against accusations of extreme biocentrism and misanthropy, and achieve the goal of the sustainable society. It is possible to understand ecologism's ecocentrism as a product of deep ecology's influence. As previously noted, deep ecology rejected the shallow ecology movement because it accused it of being overly concerned with care for the environment for human-instrumental reasons. Instead, it embraced the deep ecology movement, which sought a new environmental ethic grounded on the theory of intrinsic value. Ecologism adopted this ethic from deep ecology. Similarly, central to both ecologism and deep ecology is the assertion that a transformation of consciousness, which recognizes the inextricable connections between humans and the non-human world, is required to bring about the sustainable society. This injects a spiritual ecocentrism into the core of ecologism, which may distract the ideology from recognizing the socio-economic factors in environmental problems.

Other critiques of deep ecology support the above finding. In recognition of ecologism's omission of the socio-economic factors in environmental problems, social ecologist, Murray Bookchin criticizes ecologism for "ignoring the corporate interests that are really plundering the planet" (Bookchin & Foreman, 1991, p. 123). According to Taylor (2005), social ecologists further criticize ecologism for overemphasizing cultural factors, such as worldviews, when developing its critiques of industrialized societies and its prescriptions for change. This leads to the underestimation of the roles played by economic factors such as globalization and the liberalization of trade. A more extreme criticism of ecologism's ecocentrism comes from liberal democrats, such as Luc Ferry (1995), who accuses deep ecology of "ecofascism" because in his opinion it attributes more value to non-human forms of life. Ecofeminists too criticize ecologism's basic goal to protect the non-human world from human exploitation as ignorant of the role of patriarchal beliefs, attitudes, and institutions in environmental problems (Salleh, 1992).

The above deficiency represents a limitation of the ideology in the context of land use decision making for sustainability. In order to strengthen the preliminary, generic land use criteria, therefore, Gibson et al.'s (2005) principles of livelihood sufficiency and opportunity, intragenerational equity, and intergenerational equity will be added to the revised, final set of generic land use criteria in Box 4.

Resource maintenance and efficiency

"Provide a larger base for ensuring sustainable livelihoods for all while reducing threats to the long-term integrity of socio-ecological systems by reducing extractive damage, avoiding waste and cutting overall material and energy use per unit of benefit" (Gibson et al., 2005, p. 116).

Although the language of the preliminary generic land use decision making criteria differ from the language used by Gibson et al.'s decision making criteria for sustainability, the concepts involved in both sets overlap. The preliminary criteria, therefore, fulfill this criterion. Firstly, they explicitly express a desire to develop communities that respect the ecological limits and carrying capacity of a given area. This would help ensure the maintenance of the integrity of socio-ecological systems. Secondly, the criteria explicitly seek to protect the longevity of the socio-biophysical systems involved in each case. This favours the maintenance of the long-term integrity of socio-ecological systems. Thirdly, the criteria explicitly seek to protect the carrying capacity of a given area by ensuring appropriate land use, population levels, and resource consumption and extraction. This implies an emphasis on resource conservation and efficiency. Finally, it has been noted that ecologism's emphasis on the interdependencies and interconnections between human and non-human systems imply that human and non-human systems can be fused to create the concept of the socio-ecological system, or the socio-biophysical system.

Socio-ecological civility and democratic governance

"Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices" (Gibson et al., 2005, p. 116).

Altogether, the preliminary criteria do not fulfill this criterion. Firstly, although the preliminary criteria emphasize inclusive and equal consideration, engagement and representation, they do not acknowledge key aspects of participatory decision making processes, such as open and inclusive dialogue and social learning. The above criterion by Gibson et al. (2005) recognizes the importance of engaging the public interested in decision-making on the issues pertaining to each case. Moreover, they point to a degree of appropriate education for the participants in decision making. By emphasizing reciprocal awareness, the above criterion acknowledges the social dynamics of deliberative decision making, which may involve a plurality of perspectives and opinions (see Smith, 2003). Smith (2003), for example, stresses that deliberative decision making models require that participants make "reflective judgements" (p. 25), which are the result of reflecting upon the different perspectives involved. Secondly, the preliminary criteria do not acknowledge the connections and dynamics between administrative, market, customary, and personal decision making practices. As previously discussed, this is indicative of ecologism's anti-anthropocentrism and bias towards the protection of non-human interests. In addition to this bias, it is indicative of ecologism's neglect of human decision making processes in general and their impact on the environment. In order to strengthen the preliminary, generic land use criteria, therefore, Gibson et al.'s principle of

socio-ecological civility and democratic governance will be added to the revised, final set of generic land use criteria in Box 4.

Precaution and adaptation

"Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise and manage for adaptation" (Gibson et al., 2005, p. 117).

The preliminary criteria do not fulfill this criterion. Firstly, although the preliminary criteria do require that decision makers adopt a precautionary approach to the use of technology, they do not recognize the implications of uncertainty, in general, for decision making. These uncertainties, for example, may relate to ecological functions and processes, certain ecological features, or the cumulative impacts of certain land uses on certain species for which there may be little or no data. Secondly, the preliminary criteria do not explicitly emphasize planning to learn, designing for surprise, and managing for adaptation. Ecologism does, however, recognize the interconnections and interdependencies within and between ecosystems and human systems. This may imply that we should mind these ecological realities and therefore, plan to learn, design for surprise, and manage for adaptation. However, ecologism's lack of explicit recognition of the significance of uncertainty is again indicative of ecologism's weak consideration of the dynamics of socio-political processes in relation to ecological realities. As previously demonstrated, ecologism does not go farther than advocating decentralized and inclusive processes for decision making. In order to strengthen the preliminary criteria, therefore, Gibson et al.'s principle of precaution and adaptation will be added to the revised, final set of generic land use criteria in Box 4.

Immediate and long-term integration

"Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains" (Gibson et al., 2005, p. 117).

The preliminary, generic land use criteria do not fulfill this criterion. Although the preliminary criteria do speak of protecting socio-biophysical and socio-ecological interests and ecologism's radical green strategies for change include lobbying, the criteria do not consider how they may connect with multiple sectors of society. This is indicative of ecologism's desire to transform the whole of society, rather than adjust to the status quo. Ecologism, therefore, does not seek immediate and long-term integration within industrialized societies. This deficiency is due to the fact that ecologism is an ideology that seeks to confront dominant paradigms; it was not developed to provide the basis for land use decision making. Moreover, as part of Gibson et al.'s criteria, this principle reflects their intention to develop a set of criteria that can be used to guide decision making for sustainability in general, all over the world. Nevertheless, for the purpose of this exercise, Gibson et al.'s principle of long term and immediate integration will be added to the revised, final set of generic land use criteria in Box 4.

Test #1 Results: Overall strengths and limitations of preliminary generic land use decision making criteria

The preliminary generic criteria did not meet Gibson et al.'s (2005) criteria pertaining to livelihood sufficiency and opportunity, intragenerational equity, intergenerational equity, socio-ecological civility and democratic governance, precaution and adaptation, and immediate and long-term integration. This demonstrates the limits of ecologism at least partly due to its bias towards the non-human world; its ethical code of conduct, theory of need, biospherical egalitarianism, belief in participatory democracy, and faith in the science of ecology are oriented towards anti-anthropocentrism and ecocentrism. These themes limit ecologism's capacity to acknowledge the broad, human-centred, socio-economic and political factors in environmental problems, such as the distribution of resources, disparities between the rich and poor, and the capabilities of future generations to live sustainably. They also limit ecologism's ability to address the finer human-oriented details related to precaution and adaptation in decision making, and the social dynamics in democratic governance. Gibson et al.'s democratic governance criterion, for example, reflects some of the dynamics of participatory decision making processes, but ecologism's desire for inclusive and equal consideration, engagement and representation are geared towards protecting the non-human world; therefore, they ignore the finer details of participatory decision making processes.

In one major aspect, however, the land use criteria based on ecologism go above and beyond Gibson et al.'s (2005) criteria and this central aspect represents ecologism's overarching strength in the context of land use decision-making for sustainability. Ecologism's ethical theory extends the moral community to incorporate non-humans and it explicitly injects human beings into the natural world; therefore, it is impossible to separate human health from ecological health. This connection of the human and ecological realms is supported further by ecologism's belief in the science of ecology and systems thinking—also geared towards the non-human world. In this way, the preliminary criteria can consistently speak of representing the human and ecological and biophysical components of a system as units— as functional, socio-ecological or socio-biophysical constituents within a whole system—with interests that are necessary for the integrity of the socio-ecological unit.

At times, Gibson et al.'s (2005) criteria do not reflect this fusion. For example, the principle of intragenerational equity might be strengthened by ecologism's ethical theory by explicitly including the non-human world in the concept of intragenerational equity. Similarly, the principle of intergenerational equity might be strengthened if the opportunities and capabilities that it wishes to preserve or enhance explicitly embrace the non-human world—of future socio-ecological generations. Ecologism's ethical theory, therefore, which extends the moral community around non-humans, is its overarching strength in the context of land use decision making for sustainability.

Finally, it may be that Gibson et al.'s (2005) criteria are intended for a different audience than ecologism; therefore, it may not be fair to ask the land use decision making criteria based on ecologism to fulfill Gibson et al.'s criteria. As an ideology, ecologism is aimed at the transformation of whole societies, while Gibson et al.'s criteria are oriented towards a particular sector or sectors of societies around the world, i.e., environmental assessment practitioners and public decision making bodies. Both, however, are

concerned with sustainability and this common goal underlies the appropriate use of Gibson et al.'s criteria as a test for the criteria developed by this study.

Land use decision making is affected by case-specific variables that are driven by the socio-economic, political, and ecological contexts in which they occur. Chapter 3 describes this context for the Waterloo Moraine land use issue. Chapter 4 applies the revised generic criteria (Box 4) to the case specific context of the subject land use issue.

Box 4. Summary of final generic land use decision making criteria derived from Dobson (2000) and *Gibson et al. (2005).
(* indicates the criteria to which Gibson et al. contributed).

Land use decision making must adopt a systems approach that is oriented toward maintaining socio-ecological diversity, respecting the temporal and spatial interdependencies within and between socio-biophysical systems, and protecting the longevity of the socio-biophysical systems involved in each case.

*****All of the phases, structures and processes of land use decision making must be oriented towards inclusive and equal engagement and representation of the socio-biophysical units in the systems involved in each case and must build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices.

During times of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of socio-ecological diversity, respecting the temporal and spatial interdependencies within and between socio-biophysical systems, and the protection of the longevity of the socio-biophysical systems involved.

Land use decision making must work towards outcomes that are non-human-instrumental.

Land use decision making must work towards the development of small, decentralized, self-reliant communities that are defined by bioregional boundaries and respect the limits of immediate and surrounding socio-ecological systems so that the carrying capacity of a given area is not exceeded by land use, population level, and resource consumption and extraction.

*****Land use decision making must ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity.

*****Land use decision making must ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor.

*****Land use decision making must favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.

*****During all phases of land use decision making, decision-makers must adopt a precautionary approach to the use of technology, respect uncertainty, avoid even poorly understood risks of serious

or irreversible damage to the foundations for sustainability, plan to learn, design for surprise and manage for adaptation.

*****Land use decision making must apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.

The Waterloo Region

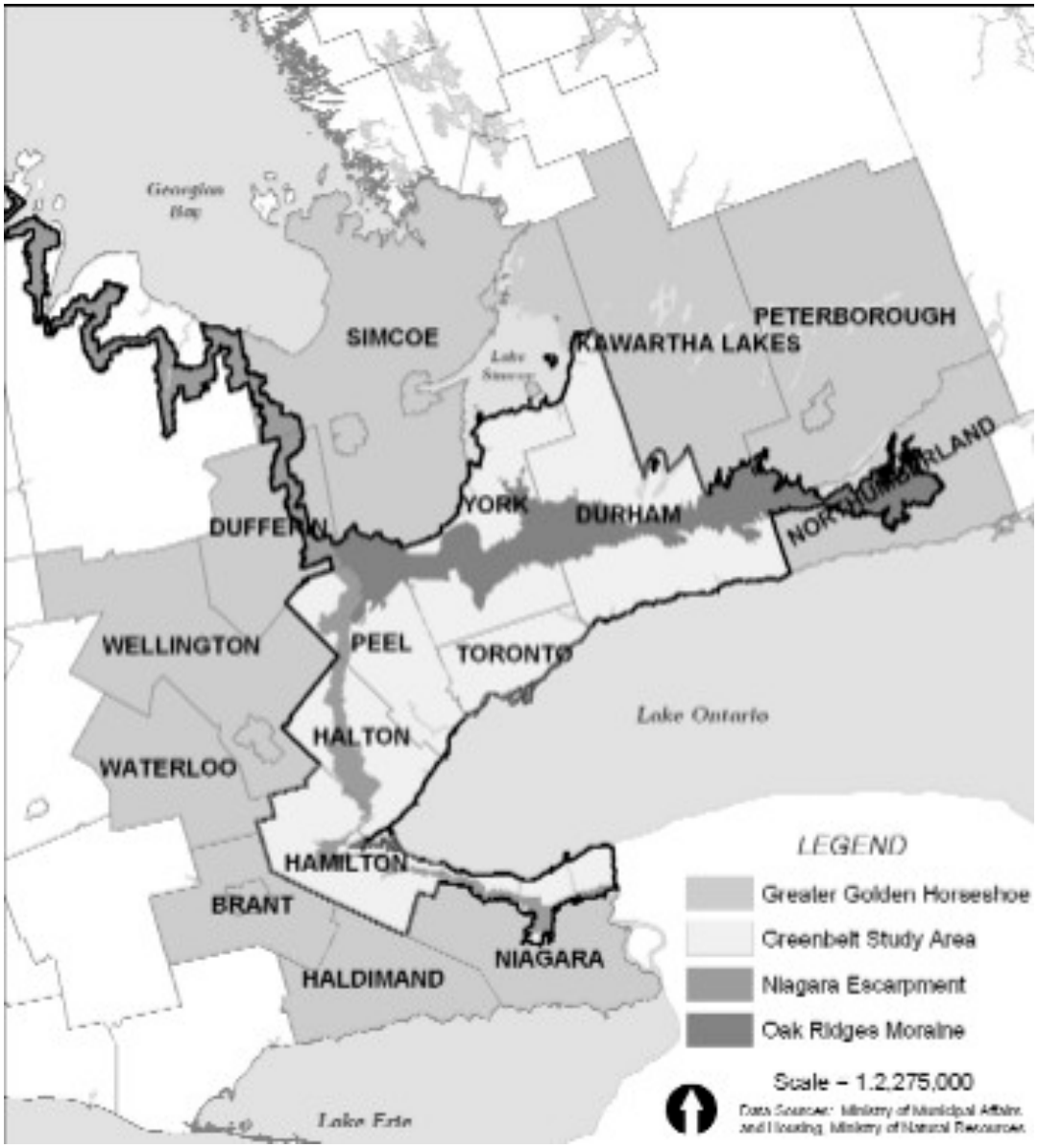
The Region of Waterloo is situated in the southwestern portion of an intensely populated and industrialized region known as the Greater Golden Horseshoe (GGH) in southern Ontario (Figure 1). The GGH is comprised of cities, regional municipalities and counties that hug the southern tip of Lake Ontario, creating a horseshoe shape. It is the fastest growing urban area in Canada; by 2031, the population of this area is forecast to reach 11.5 million people (Ministry of Public Infrastructure Renewal, 2006). The Region of Waterloo is one of the fastest growing communities in the GGH; its current population, approximately 498,000 is expected to grow to 729,000 by 2031 (Region of Waterloo, 2007). The region's urban municipalities—Cambridge, Kitchener and Waterloo—experience most of this growth. However, growth is also felt by the region's rural townships—North Dumfries, Wellesley, Wilmot and Woolwich. As a result of the expansion of the GGH, the Province of Ontario has established policy directives through the Provincial Policy Statement and the Places to Grow Act, 2005, to guide growth in a manner which, among other aims, seeks to revitalize downtowns and city centres, and reduce development pressures on agricultural lands and natural areas.

The Waterloo West Side lands

The land-use debate with which this study is concerned involves plans for three residential subdivisions within the municipality of Waterloo: Clair Creek Meadows, Greyerbiehl, and Vista Hills. They are controversial because they impinge upon a number of environmentally sensitive features of the regional landscape, including a portion of the recharge soils of the Waterloo Moraine, a significant groundwater source for the Region of Waterloo. The lands on which these subdivisions may be constructed are popularly known as the "Waterloo West Side Lands". They are nestled, side-by-side, along the western boundary of the City, immediately adjacent to the Township of Wilmot (Figure 2). An Environmentally Sensitive Policy Area, Forested Hills (ESPA 19), lies to the north and east of Vista Hills, and to the east of Clair Creek Meadows. All properties have frontage onto the Wilmot Line to the west, a two-lane, rural roadway that provides the boundary line between the municipality of Waterloo and the township of Wilmot. This predominately agricultural area is situated within the Waterloo hills physiographic region in southern Ontario, a landscape characterized by hummocky and rolling hills spotted with wetlands and fragments of upland and lowland forests.

Figure 1. Location of the Region of Waterloo in the Greater Golden Horseshoe area

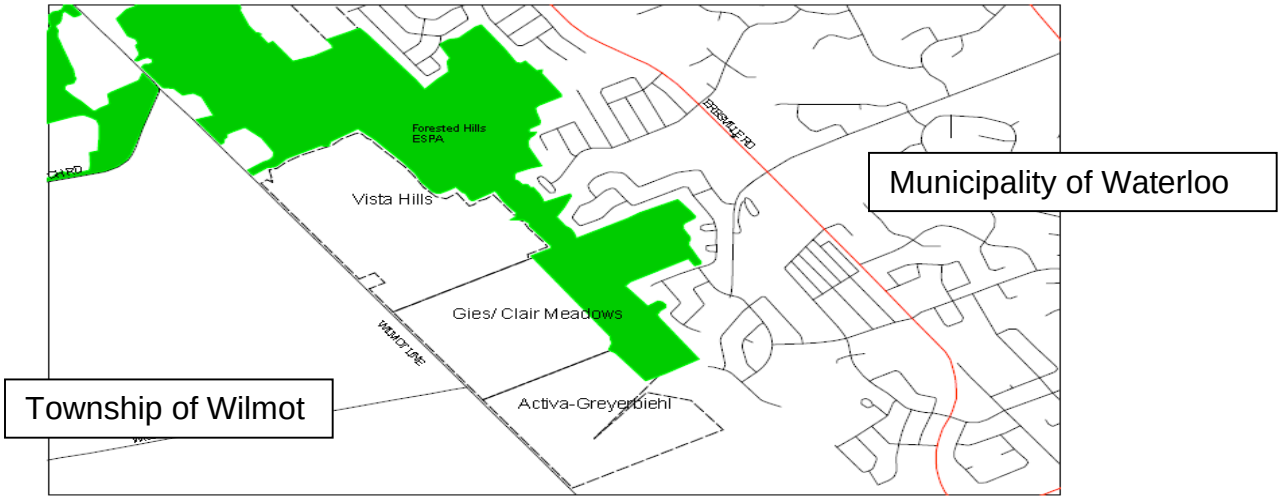
(Ontario Ministry of Municipal Affairs and Housing, 2004)



Draft plan of subdivision details

Future residents of Clair Creek Meadows, Greyerbiehl, and Vista Hills will comprise the neighbourhoods of the Columbia Hills and Clair Hills Districts. According to the City of Waterloo (2006), these subdivisions may occupy 132.58 hectares for 1378 to 1618 residential units, including single detached, semi-detached, duplex, and townhouse dwellings for approximately 4500 people. To fulfill an objective of the Provincial Policy Statement, the West Side Lands will be used more intensively to create more compact neighbourhoods than have been typical in Waterloo. The average maximum density for all three subdivisions, for example, is 14.68 units per hectare. All dwelling types may include garages with varying length, width and vehicle capacity specifications. Institutional buildings within these districts may include schools, churches, parks, playgrounds and community facilities, government buildings, museums, and post offices. The Vista Hills plan of subdivision includes an amphitheatre park with, among other attractions, trails, trailhead kiosk, and lookout. The Greyerbiehl plan of subdivision includes a 0.43 hectare industrial zone for small-scale, low emission operations such as laundry services and repair establishments. Both Greyerbiehl and Clair Creek Meadows subdivision plans include an elementary school with access trails through the portion of ESPA 19 that stretches around the west side of Vista Hills and Clair Creek Meadows (City of Waterloo, 2006).

Figure 2. Site location of Vista Hills, Clair Creek Meadows, and Greyerbiehl.
(Region of Waterloo, 2005)



Subdivision approval conditions

The owners of the West Side Lands must enter into an extensive Subdivision Agreement with the City of Waterloo as part of the draft plan of subdivision approval process. This ensures that the owner satisfies all requirements of the municipality as part of the approval process. Many of the standard subdivision conditions of the Subdivision

Agreement for the West Side Lands reflect the concerns of the Region, City, Grand River Conservation Authority, concerned citizens, and community organizations. A brief description of some of these conditions will follow. They must be completed to the satisfaction of the City, Region, and/or the Grand River Conservation Authority, depending on the stipulation.

For example, according to the City of Waterloo (2006), the Subdivision Agreement for the subject subdivisions stipulates that the Stormwater Management Plan must take steps to ensure that ESPA 19 is protected from any erosion that might occur due to run-off. Amphibian-friendly culverts are to be installed so that frogs might travel between ESPA 19 and the wetlands within the hydro corridor. Street lights are to be directed away from the ESPA 19. Native wetland vegetation must be relocated to the retained wetlands. Native shrubs must be planted between the wetlands within the ESPA buffer and the ESPA woodlands in order to create additional wildlife habitat. Construction activities must comply with the Migratory Bird Convention Act, which stipulates that migratory birds and their nests must not be harmed by construction activities in migratory bird habitat from May 1 to July 15. The construction of the subdivisions must maintain the natural topography as much as possible. The grading, servicing, and construction phases must be accompanied by a site monitoring plan that includes permanent groundwater monitoring wells, and the owner must mitigate any negative effects on groundwater or surface water quantity and quality. The owners of the subdivision must require the builders to provide an Energy and Green Building Initiatives Guide and a "Living With Nature in West Side Waterloo: A Good Neighbour's Guide" to home purchasers as part of the Agreement of Purchase and Sale.

The planning context

Legislative and policy framework

The legislative and policy framework guiding the subdivision development approval process in the Region of Waterloo begins with the Ontario Planning Act and Ontario's Environmental Assessment Act. The Planning Act prescribes criteria that must be applied when a subdivision application is considered for approval. These criteria specify that any application for development must conform to Official Policy Plans and must show regard to or be consistent with the Provincial Policy Statement. Section 3 of the Planning Act stipulates that the province of Ontario reserves the right to develop policy related to land use planning matters. The Provincial Policy Statement, 2005 (Ontario Ministry of Municipal Affairs and Housing, 2005), is one such attempt to provide policy direction on matters of land use planning and development. It contains a set of policy statements that are organized under three key sections of the act: *Building Strong Communities; Wise Use and Management of Resources; and Protecting Public Health and Safety*.

First passed in 1975, Ontario's Environmental Assessment Act (EAA) mandates that municipalities undertake an environmental assessment (EA) for enterprises, activities, proposals, plans, and programs. These often include public infrastructure developments (roads and highways), waste management facilities, sewage and water facilities, and transit works. Any of these undertakings, however, may be exempt from the EA process with approval from the Minister of the Environment. Private sector undertakings may be subject to the EA process if Cabinet passes a regulation that directs

them to do so. The proponent may voluntarily engage in the EA process. Individual citizens may also request that the Minister of the Environment direct a private project to undertake an EA subject to the requirements of the EAA. Most municipal projects, however, are not required to undergo an individual EA. Instead, they follow a streamlined process under the provisions of a Class EA. These types of projects are usually routine and predictable: municipal roads, sewage and water infrastructure, highway construction and maintenance, forest management activities, and works undertaken by conservation authorities.

As noted above, under Section 3 of the Planning Act (1990), the actions of any provincial, municipal or local government body must be consistent with the Provincial Policy Statement. The Region of Waterloo's Regional Official Plan (ROP) and the City of Waterloo's Official Plan (OP), therefore, must be consistent with the Ontario Planning Act and the Provincial Policy Statement. Regional and Municipal OPs establish planning policies and goals to guide and control overall development and growth, including infrastructure and services planning, future land use planning, and zoning by-laws. The City's OP is obligated to be in compliance with the Regional OP. Municipal and regional councils cannot pass any by-law or permit any development that does not conform to the approved Regional Official Plan. If a development proposal does not conform, the land owner must file an application for Official Plan amendment in order to move forward with the proposal. The Region of Waterloo Growth Management Strategy (RGMS) and the City of Waterloo Strategic Plan build on the Regional Official Plan to flesh out the details of urban and rural growth. The 2003 RGMS, for example, proposed to amend the Regional Official Plan to designate newly identified ESPAs.

In 2005, the Places to Grow Act received Royal Assent. This Act allows the Government of Ontario to designate any area of land in the Province as a growth plan area. It reflects the intentions of the Provincial Policy Statement and land use within any growth plan area is subject to the conformity requirements of the Planning Act. Additionally, official plans must conform to the Growth Plan. Under the legislative framework of the Places to Grow Act, the Government of Ontario released the Growth Plan for the Greater Golden Horseshoe, 2006. The underlying goal of this Growth Plan is to manage rapid growth to avoid or mitigate the negative aspects associated with it: traffic congestion, deteriorating air and water quality, and the depletion of agricultural lands and natural resources.

Figure 3 depicts the legislative and policy framework within which land use planning and development occur in the Region of Waterloo.

Figure 3. Legislative and policy framework

Plans of subdivision approval process

In August 1986, five property owners on the West Side of Waterloo requested an amendment to the ROP and the City of Waterloo Official Plan in order to change the designation on their lands from "Rural" to "Urban". This designation change would allow development activities otherwise prohibited if the land remained "Rural".

In 1986, when the owners of the West Side lands applied for plan of subdivision approval, the approval process prescribed by the ROPP, 1984, included three major phases: the preliminary approval process, the formal approval process, and Regional Council approval or Regional Commissioner of Planning and Development approval. During this time, the Province of Ontario, which had approval authority for subdivision applications, delegated this authority to the Region of Waterloo. Since 1976, Regional Council, through a Regional By-law, has delegated approval authority to the Commissioner of Planning, Housing and Community Services. In 1996, the Planning Act was amended and the Region of Waterloo became the approval authority for subdivision applications (Region of Waterloo, 2006).

The Ontario Municipal Board

Landowners or concerned citizens may appeal municipal land use decisions to the Ontario Municipal Board (OMB). As a provincially appointed tribunal that operates under the OMB Act, the OMB may make decisions on many different land use issues. The Board is comprised of members (lawyers, accountants, architects, planners and

public administrators) who are appointed by Cabinet. Once a citizen or landowner makes an appeal to the OMB, the appeal is sent to a hearing, pre-hearing, motion, or mediation process for a final decision.

In 2004, the Strong Communities Act, 2004, received Royal Assent. It gives municipalities more time for the development application approval process. It also prevents proponents from appealing to the OMB for proposals rejected by municipal governments. This Act aims to help municipalities curb urban sprawl and redirect growth away from certain areas such as ESPAs or farmland.

Surrounding ecological systems

The Laurel Creek Watershed

The West Side lands are situated within the Laurel Creek Watershed (LCW), an area of approximately 74km^2, nestled within the larger Grand River Watershed (see Figures 4 and 5) in southwestern Ontario. Most of this watershed is located in the City of Waterloo, but it also extends into the townships of Wellesley, Wilmot, and Woolwich, and the City of Kitchener. It is comprised of Laurel Creek, which eventually drains into the Grand River; and several tributaries: Beaver Creek, Cedar Creek, Clair Creek, Forwell Creek, Maple Hill Creek, and Monastery Creek.

The LCW has been divided into subwatersheds. These subwatershed divisions are important because they provide the boundaries for subwatershed studies that guide land use decision making in the area. According to the City of Waterloo's *West Side Lands Environment Impact Study* (Planning & Engineering Initiatives Ltd. et al., 2004), the subject subdivision lands are adjacent to or within subwatershed 307, 309, 313, and 314. Clair Creek Meadows and Greyerbiehl are situated within subwatershed 313, which comprises the headwaters of the North Branch of Clair Creek. This Creek flows into the Vista Hills property and then into ESPA 19. Subwatershed 309 comprises approximately 25% of the subdivision lands and subwatershed 307 comprises approximately 5% of the subject lands. Studies have been completed for subwatershed 309, 313, and 314.

The LCW also contains the Laurel Creek Conservation Area, which is well known for its Provincially Significant Wetlands, and a diverse array of provincially significant flora and fauna. Since the area is underlain by well-drained soils and moraines, it is also a valued component of the Region of Waterloo's groundwater recharge system. In 1993, the Laurel Creek Watershed Study was completed by the Region of Waterloo as a guide for future land use in this sensitive area.

Figure 4. The Laurel Creek Watershed

(Grand River Conservation Authority, 2004)

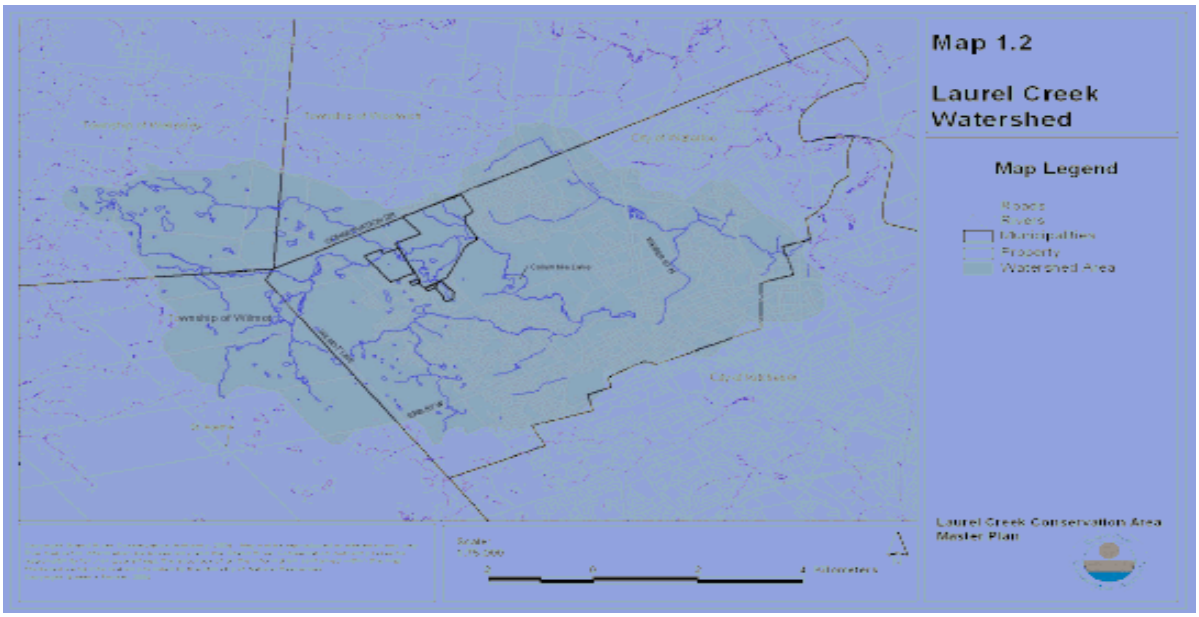
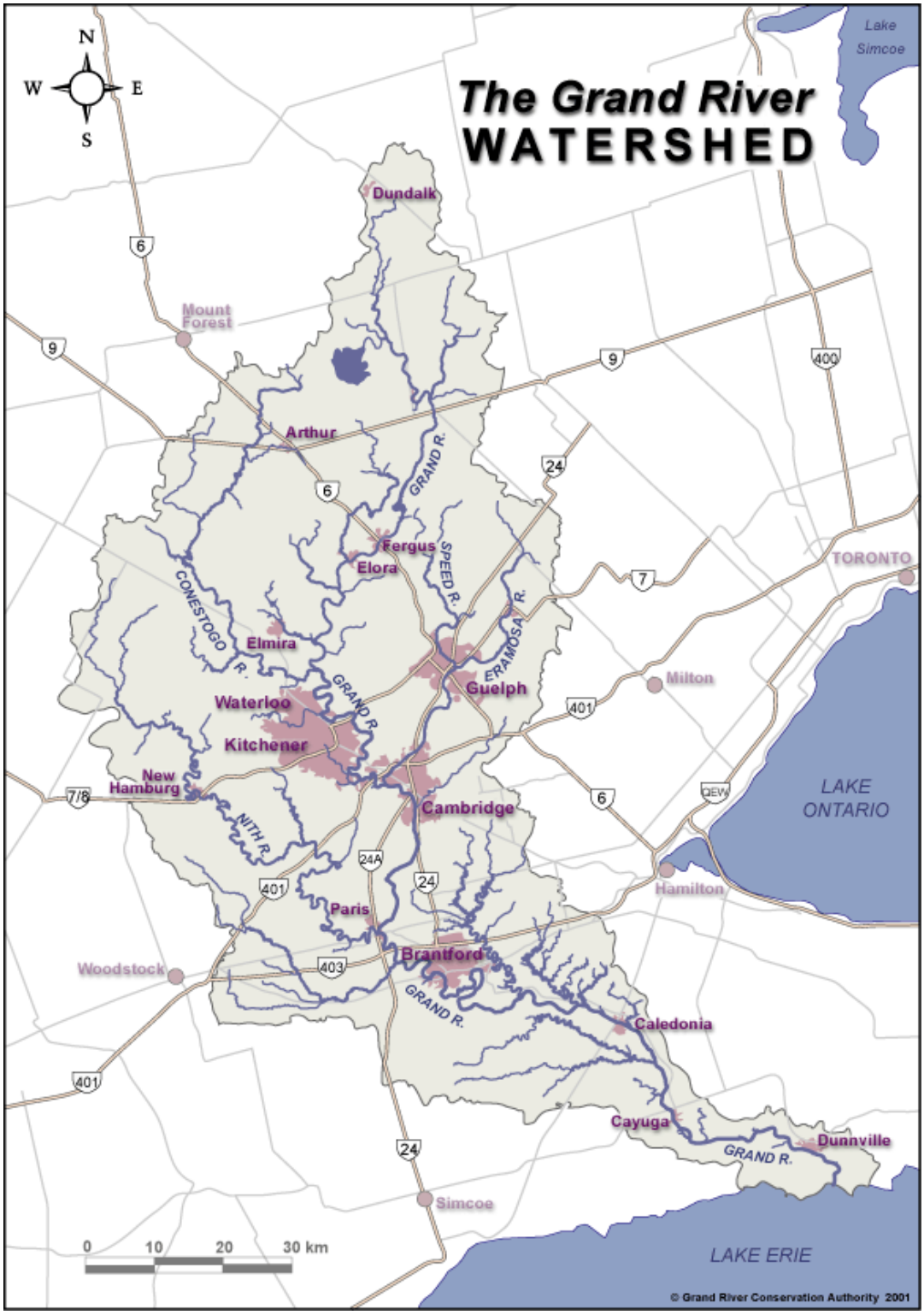


Figure 5. Grand River Watershed
(Grand River Conservation Authority, 2007).



3.5.2.

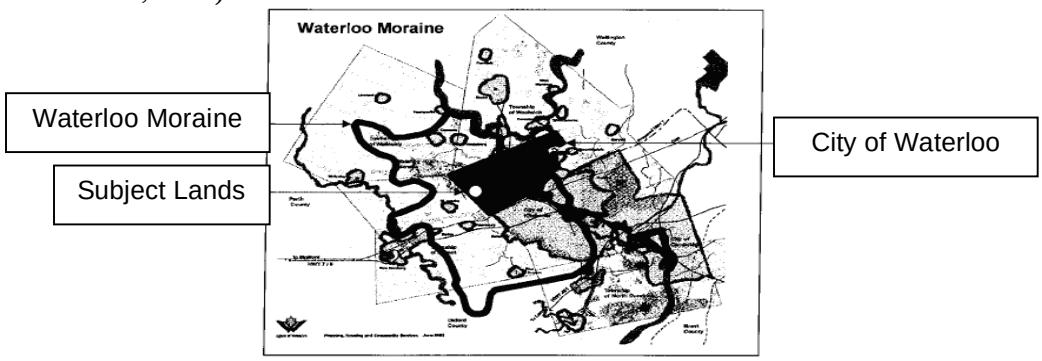
The Waterloo Moraine

The subject lands are situated on a portion of the Waterloo Moraine, a 736km^2 complex glacial moraine system that eventually discharges to the Grand River and its tributaries. It was formed by glacial activity during the late Wisconsin age. The waters of the moraine are tapped by the Region of Waterloo for the Region's drinking water. The system also functions to support significant environmental features, such as fisheries, wetlands and ESPAs.

The Waterloo Moraine system is comprised of several aquifers and aquitards with varying thickness and hydraulic potential. According to Frind, Muhammad, and Molson (2002), the glacial overburden of the moraine is comprised of a diversity of materials, including clay, interbedded tills, fine sand, and sandy and coarse gravel. In some places, the overburden is thicker than 100m. According to Naylor Engineering Associates Ltd. (2005), the subject lands are situated within the Waterloo Moraine's main aquifer recharge zone. However, specific subsurface data show that significant recharge occurs only in areas where coarse sand is exposed. The sand deposits across most of the subject lands are overlaid by a cap of glacial till, from 5m to greater than 10m in thickness. The Vista Hills site, however, contains an area of exposed sand at the northeast corner of the property. Here, the baseflow of the North Branch of Clair Creek recharges into the sand deposit and eventually infiltrates to the regional aquifer.

Figure 6. Site location on the Waterloo Moraine

(City or Waterloo, 2006)



The ESPA network

The subject lands are located between the southern edge of ESPA 19 and the Wilmot Line. Approximately 4 hectares of the Vista Hills subdivision are located in the southern edge of ESPA 19 (Planning & Engineering Initiatives Ltd. et al., 2004b).

ESPAs are ecologically sensitive areas that have been granted ESPA status by the Region of Waterloo. To qualify for ESPA designation, a natural area must meet a number of criteria stipulated by the ROP. These criteria refer to the representative quality of the ecological communities within a given natural area, the size of the area, the status of the species in a given area, and the diversity of native life forms therein.

As noted, ESPA 19 lies to the north and east of Vista Hills, and to the east of Clair Creek Meadows. This ESPA is one patch of a larger network of ESPA patches, specifically ESPA 17, 76, 10, and 80. Together, these forested areas may provide habitat

for a diverse array of plants and animals. Moreover, among other ecological functions, such as maintaining water quality and preventing soil erosion, they may provide essential movement corridors for dispersal and immigration.

Recently, with the development and implementation of the Greenlands Strategy (Region of Waterloo, 2004), the Region of Waterloo has recognized the importance of maintaining and/or enhancing the connectivity of these natural areas. The Strategy has two overriding goals, which are placed within the context of projected population growth and urban development. First, it intends to protect ESPAs and other ecologically significant lands from inappropriate development. Second, it aims to develop partnerships between government, private sector, and the voluntary sector to implement the strategy.

Key Socio-ecological Concerns

Urban Growth

The Region of Waterloo is faced with many challenges that accompany urban growth. These challenges include, to name a few, increasing traffic congestion, sprawl, natural resource degradation, and public health concerns. The Waterloo Moraine land use issue is just one example of the diverse range of stakeholders and intense community activism that may accompany these growth issues.

Ontario's Places to Grow Act 2005, which encourages the reurbanization of core downtown areas, may guide the Region as it plans for urban growth. For example, as part of the Region's attempt to revitalize its downtown core areas, a light rail rapid transit line has been proposed. It will form a Central Transit Corridor connecting the downtown core areas of Kitchener, Waterloo, and Cambridge.

Despite policy efforts, however, contentious land use issues continue to surface. At the time of this writing, community activism surges around a controversial traffic congestion alleviation project that involves extending a highway through part of an ESPA in southern Kitchener. Letters to Council and citizen presentations pertaining to the West Side Lands issue reveal a deep concern for stewardship of natural lands and the maintenance of rural identity and quality of life. During a public meeting regarding the redesignation of the west side lands, for example, one citizen expressed that the proposal would threaten her rural identity. In her opinion, "an urban designation would set in place an unstoppable chain reaction of runaway land speculation, zone change applications, development proposals, road widening—especially through the tightly conformed village of Erbsville…that would ultimately affect the quality of life for residents on the West Side…" (City Region of Waterloo, 1992, p. 11).

Urban growth in the Region may presently be at a critical juncture. Some of the Region's land use issues, such as the subject subdivision proposals, which are coming to a close, began in the late '80s—before reurbanization efforts and other sustainable development strategies surfaced as growth management priorities. The settling of the Waterloo moraine land use issue, and other disputes which arose during this decade, may mark the beginning of a residential development trend in the Region that sees developers' interests turn towards inner city lands. The previously discussed Strong Communities Act, 2004, may support this trend.

Water quantity and quality

Approximately 77% of the subject development lands are situated within the catchment area of the north branch of Clair Creek (Frind, 2006). Consequently, since the late '80s, the subdivision development proposals have been closely associated with the issue of Regional groundwater and surface water quantity and quality. About 75% of the Region's water supply is provided by groundwater and 25% comes from the Grand River (Region of Waterloo, 2007b). The aquifers of the Waterloo Moraine provide 50% of all the groundwater accessed by the Region through the municipal water supply system (Grand River Conservation Authority, 2005).

According to Frind (2006), the pre-development conditions of the flow of water through the subject lands are such that the entire catchment area of the north branch of Clair Creek is a recharge area for the deep aquifer. A shallow aquifer feeds the baseflow of Clair Creek and in return the Creek eventually feeds the deep aquifer. Post-development plans to ensure the maintenance of pre-development recharge levels to the deep aquifer include the implementation of a Clean Water Collection (CWC) system designed to collect roof runoff and foundation drainage. The collected water would flow through a perforated pipe to a stormwater management pond where the water would be allowed to infiltrate through the sandy soils and into the deep aquifer. Because of the impervious nature of most of the site, the volume of water reaching the deep aquifer will depend almost entirely on the performance of the pipe system. The long-term functioning of this system, therefore, is essential. Frind, however, asserts that there is a severe lack of data pertaining to the long-term performance of the CWC system and therefore its long-term performance is uncertain.

This uncertainty raises fears that water quality will also be affected by the subject subdivision developments. One potential for contamination is from chloride associated with road salt. Due to grading, in some places the clayey till cap that normally protects the aquifer from runoff contaminants will be reduced by 8-9 meters (Frind, 2006). Frind asserts that the result is that in some places the thickness will be zero or near-zero, posing a risk of contamination of the underlying aquifer. The natural state of the clay till is such that it may already contain microscopic fractures that function as passageways for contaminants; therefore any reduction in thickness increasingly compromises the protective capacity of the clay till. This potential for chloride contamination of the aquifer is significant in light of the fact that, due to road salt, approximately 5% of the municipal groundwater supply already exceeds the Ontario Drinking Water Standard for chloride (Region of Waterloo, 2003).

Growth pressures on the Region's water supply are not confined to the Waterloo Moraine. The water supply issue is exacerbated by population growth in the entire Region. Expected growth prompted the Municipal and Regional Councils to initiate the Long Term Water Strategy (LTWS) in 1991. The chief goal of the LTWS was to select a water supply option for the Region to the year 2041. The *Strategic Plan* produced by the LTWS recommended, among other options, the construction of a pipeline to Lake Huron or Lake Erie by 2018 (Region of Waterloo, 2000). Continued population growth and the associated pressures on the Region's water supply have contributed to the controversial nature of the subject subdivision proposals. Recent legislative developments in Ontario, such as the Clean Water Act 2006, provide additional fuel for community organizations that seek to protect the moraine from further development.

Traffic and air pollution

Traffic issues raised by concerned citizens and residents near the subject subdivision proposals (e.g., City of Waterloo, 1992) pertain to how an increase in traffic might impact the ESPAs adjacent to the Wilmot Line, as well as air quality, noise, and groundwater and surface water quality. Any new road extension to the Wilmot Line, currently an unpaved rural road, would increase traffic to this rural area. A Waterloo West Side Traffic Impact Study (Paradigm Transportation Solutions Ltd., 2005) estimates that new road developments to the subdivisions would increase traffic to approximately 1335 cars per hour during AM peak hours and 1655 cars per hour during PM peak hours. The Wilmot Line, then, may need to be upgraded to a 2-lane paved road to accommodate future traffic (City of Waterloo, 2004).

The City aims to create an intersection design that would minimize the potential environmental impacts of increased traffic and road upgrades to ESPA 19. The preferred District Plans concept focuses on minimizing the impacts of cars by dispersing traffic to the Wilmot Line by not allowing direct vehicular access to the rural road (City of Waterloo, 2004). The District Plans also focus on narrower road widths to encourage slower driving and groundwater protection; pedestrian environments to promote walking; the use of a grid pattern of streets to protect the natural topography; and allowing the use of steeper street grades to protect groundwater and the natural topography (City of Waterloo, 2004).

As of June 2004, Council approved the plans to eliminate vehicular access to the Wilmot Line, north of Columbia Street. It also approved an addendum to a 1997 Columbia Street Class EA to restrict vehicular access to the Wilmot Line through the design of the intersection of Columbia Street and the Wilmot Line (Region of Waterloo, 2006b). In June 2006, however, the City of Waterloo, the Region and the Township of Wilmot began to reconsider the Class EA for the intersection of Erb Street and the Wilmot Line. This Class EA also includes the possibility of improving the Wilmot Line just south of Columbia Street.

Ecological integrity of the ESPA network

A letter from two landowners near the subject lands clearly demonstrates the value of the ESPA network for some local residents. Specifically, some citizens value the connectedness of the ESPA network for the purpose of species dispersal and migration. These citizens assert that road improvements and increased traffic will fragment this network and degrade or destroy adjacent Provincially Significant Wetlands. It has been proposed, therefore, that ESPA edges and wetlands be protected from development by 15m to 30m buffers (Planning & Engineering Initiatives Ltd. et al., 2004). Efforts will be made to ensure that the boundaries between private and ESPA lands are maintained and the grading of the development will correspond to natural grading in order to protect catchment areas.

Light pollution may be an issue for many species. Planning & Engineering Initiatives Ltd. et al. (2004) recommend the initiation of an education and awareness program to encourage residents to mitigate the potential negative impacts of light on ESPA 19.

Appropriate development for the West Side Lands

While citizens of community groups, such as the Citizens for the Protection of the Waterloo Moraine, have always sought sustainable development or no development of the subject subdivisions, the commitment of Regional and City Councils to sustainable development has varied in strength depending on the Council in office. This is evident in the reactions that the different Councils have had in response to the various proposals to extend Columbia Street to the Wilmot Line.

Nevertheless, sustainable development appeared as a concern around the time of the initiation of the Laurel Creek Watershed Study (LCWS) in 1992. The Watershed Study was a deliberative process initiated by the Region in response to citizens' concerns for the ecological integrity of the watershed environment. It explicitly voiced that there is a "need to better understand the connectivity and functions of all parts of the Watershed stream system so that future planning and development can avoid negative impacts" (City of Waterloo, 1992b). It characterized the West Side Lands as either Constraint Level 1, 2 or 3 areas and these Constraint Areas were incorporated into the ROP and the City's OP to guide development on the West Side. Various levels of development are permitted in each level as appropriate.

Because concern for sustainable development in the Waterloo moraine case is oriented towards appropriate development for Constraint Level 1, 2, and 3 areas, the term "sustainable development" here should not be confused with Gibson et al.'s (2005) "essentials of the concept of sustainability" (p. 62), discussed in section 2.2., which are much broader in scope. Gibson et al.'s essentials of the concept of sustainability include socio-economic concerns (e.g., livelihood sufficiency and opportunity, intragenerational and intergenerational equity), which were not explicitly addressed by the LCWS. This study therefore recognizes that the Region and the City aimed for sustainable development of the West Side Lands; however, because the full suite of sustainability issues was not address by the LCWS, this study will refer to their efforts as efforts to ensure appropriate development on the West Side Lands.

Procedural, structural, and economic concerns

The Region, City, and landowners have been obliged to adhere to the legal land use planning structures and processes stipulated by the Ontario Planning Act. This planning process included adopting a revised ROPP in 1985, which included a population forecast that indicated a need in the City of Waterloo for new lands for residential development. It also forced the City to respond to the request for deferral of the "Rural" designation on the west side lands in the ROP and the City of Waterloo Official Plan. Most importantly for this case, the planning process allowed the landowners to request referral of the lands designation issue to the OMB.

This planning process is significant because it entails both positive and negative potential impacts for the environment. For example, it is clear from the case's timeline (section 3.7.2.) that the Region and the City applied the legal powers invested in the City's Official Plan and the ROP to the subject land use issue. These powers permitted the City and Region to jointly initiate the West Side Designation Study in 1986. This study, however, only further strengthened the argument for development of the West Side Lands. However, the powers invested in the ROP also permitted the findings of the Laurel Creek Watershed Study to be injected into the ROP through an amendment in

order to guide land use on the West Side. The Planning Act also calls for public input into the planning process. This may have encouraged the formation of citizens groups, such as the Citizens for the Protection of the Waterloo Moraine. Undoubtedly, it contributed to citizen input on subdivision design details, such as buffer widths around ESPA 19. Many more examples of the potential positive and negative implications of the Planning Act for the environment can be found in the timeline (section 3.7.2.).

Similarly, the structure of land use decision making may entail both negative and positive implications for the environment. In 1986, landowners could apply directly to the Area Municipality or the Region for plan of subdivision approval. According to the Plans of Subdivision (Region of Waterloo, 1984), the structure of decision making for subdivision approvals did not include concerned citizens or community organizations. Once the application was submitted it circulated within the Regional Department of Planning and Development, Municipal Council, Regional Council, other governmental departments and ministries, and the Grand River Conservation Authority. The public, therefore, may be an integral part of the planning process but it is not formerly recognized as part of the structure of decision making. Rather, the public plays a responsive role once plans have been circulated within both levels of government. The implications of this structure for the environment, then, continue to be entirely dependent on Staff and Regional and Municipal planning guidelines. If a particular subdivision proposal does not contravene any bylaws, for example, it may proceed before citizens have a chance to reject it.

Finally, the issue of finances was a key concern for the City, Region and landowners. Because Council did not have the budget to complete all of the studies involved in long term planning for the West Side, for example, it sought to take advantage of the Development Charges Act, which allows cities to collect development charges from new developments in order to compensate them for costs incurred because of development. However, before the city could employ the Development Charges Act, it had to amend the ROPP to include the West Side Lands as "Urban". Although the issue of land designation was eventually decided by the OMB, the issue of funds for infrastructure studies and environmental assessments may have pressured the City and the Region to comply with the landowners' demands.

The Waterloo Moraine land use issue

The story

The roots of the Waterloo Moraine land use issue can be traced back to 1985, when the Region of Waterloo's revised Official Policies Plan indicated a need for additional lands designated "Urban" to supply residential land needs for predicted population growth. This prompted land owners on the West Side of Waterloo to request deferral of the "Rural" designation on their lands in the ROPP and the City of Waterloo Official Plan. At this time, the Waterloo Moraine land use issue was part of the larger issue of development on the West Side. Key stakeholders in this land use issue have always been developers, Regional and City staff and Councils, concerned citizens and community groups, academics, and the Grand River Conservation Authority.

From the beginning, the Region and the City of Waterloo were sensitive to the environmental issues on the West Side. They initiated the *West Side Designation Study* (City of Waterloo, 1988) and the *Laurel Creek Watershed Study* (City of Waterloo, 1992b) in order to ensure that development on the West Side was both warranted and appropriate. These studies were in part a response to concerns raised by residents of the West Side and other citizens for their quality of life and the environmental integrity of the sensitive area. Both of the above studies frustrated the developers, who claimed that the Region only wanted to delay the inevitable. In 1990, therefore, they requested that the ROPP designations be referred to the OMB for a hearing. The OMB decided for the developers and soon the West Side lands were officially designated "Urban".

The OMB's decision marked a dramatic shift in the direction of the Waterloo Moraine land use issue. Although concerned citizens, such as those who comprised the Citizens for the Protection of the Waterloo Moraine, still campaigned against the OMB's decision, claiming that development on the West Side would negatively affect their quality of life, water quality and quantity, and wildlife, etc., the Region and the City began to initiate District Plans, Servicing Studies, Servicing Master Plans, Subwatershed Studies, and Class EAs. A significant step for the environment was taken in 1993, when the Region approved the incorporation of the recommendations of the Laurel Creek Watershed Study into the City Official Plan to guide development on the West Side.

From about 1990 to the present, the Waterloo Moraine land use issue has been characterized by numerous Draft Plan of Subdivision submissions by the developers and numerous public meetings and open houses hosted by the Region or the City to gain public input into road and subdivision designs. Although many citizens remain pessimistic about the socio-ecological impacts of the subdivisions, Regional and City Councils and the developers continue to push forward.

In 2006, City Council passed a resolution that recommends approval for the three draft plans, subject to a list of conditions, and Regional Council has received the draft plans for consideration as the approval authority. Once a solution has been determined to accommodate increased traffic at the Erb Street/Wilmot Line intersection, the Region will be in a position to support Draft Approval of the subdivisions. The ROPP mandates that Class EAs (e.g., covering the Erb Street/Wilmot Line intersection) must be complete prior to Regional or area municipality approval of the development application. Many concerned citizens continue to press for no development on the Waterloo Moraine.

Detailed chronology

1983: The Ontario Planning Act mandates that all municipalities with approved official plans undertake a review of their plans once every five years. Consequently, the Regional Council of Waterloo initiates a comprehensive review of the Regional Official Policies Plan (ROPP).

1985: Regional Council adopts a revised ROPP. The revised ROPP predicts that the Region's population will increase from 336,037 persons in 1986 to roughly 475,815 persons by 2011. Population forecasts are used as guidelines for designating land needs for residential development in the ROPP. The revised ROPP predicts that the City of Waterloo will have enough land designated "Urban" to accommodate growth until 1996.

Beyond 1996, both the Region and the City of Waterloo will need to designate additional lands "Urban" to meet residential housing needs until the year 2011.

1986: In August 1986, five property owners on the West Side of Waterloo request deferral of the "Rural" designation on their lands in the ROPP and the City of Waterloo Official Plan. In response to the land owners, Regional Council requests that the Ministry of Municipal Affairs and Housing defer all of the "Rural" lands west of the City's municipal boundary in order to give them an "Urban" land-use designation (City of Waterloo, 1988).

1986: Council adheres to a procedure outlined in the ROPP which mandates that the Region and the City follow a five-step process for any expansion of the municipal boundary. Although the Minister of Municipal Affairs initially defers this obligation at the request of a few property owners, it is jointly initiated anyway as the *West Side Designation Study* (see City of Waterloo, 1988).

The Study determines appropriate land-use designation by the ROPP for the West Side Lands. It initiates a land needs assessment, a location proposal, an evaluation of resource impacts, alternatives, and an identification of the implications of the proposal for regional services.

The Study concludes that there will be a need for additional lands to be designated "Urban" in the City of Waterloo to accommodate urban growth until the year 2011. It recommends that all of the West Side Lands be designated "Urban" for this purpose. It projects an additional 9000 housing units would be required within the West Side area to accommodate the anticipated growth: 22,000 persons on the West Side by 2011.

1988: Waterloo Council approves the West Side designation study in July and requests that the Region amend the ROPP to designate the West Side Lands "Urban". Subsequently, on October 26, 1988, a Regional Public Meeting is held to receive public input on the West Side Designation Study.

Many issues are raised by concerned citizens, including whether or not the city will pursue a sustainable development approach to urban growth. Staff admits that the approach had merit and that it can be applied to development on the West Side. Regional Council defers the matter of designation and sends it back to the city together with the issues raised at the public meeting. In response, the City and the Region decide to conduct a comprehensive environmental study of the Laurel Creek Watershed.

1990: Impatient developers request that ROPP policies and designations be referred to the OMB for a hearing.

1991: The City is pressured to resolve many outstanding issues related to development on the West Side before the OMB hearing on June 1 1992. In January 1991, the City of Waterloo partners with a variety of stakeholders to initiate the Laurel Creek Watershed Study (LCWS). It provides recommendations, based on development constraints and opportunities, which will have implications for land use policies in the City OP and the ROPP. These policies will guide future urban and rural development within the 74km^2 Laurel Creek Watershed. It is completed in 1993 (see City of Waterloo, 1993).

1991: The Region and the City do not want to proceed with the "Urban" land-use designation change until the LCWS is complete. The Region and the City are opposed to any development in the expanded "Urban" designation until more detailed studies and development policies are in place to implement the general parameters of the final Laurel Creek Watershed Plan. One of the major developers, Trillium, however, objects to the proposed changes to the ROPP, stating that any new policy statements will penalize Trillium for its previous patience and cooperation in the Laurel Creek Watershed Study process and send a message that it and other future developers should proceed immediately to the OMB. Trillium asserts that the LCWS and the issue of injecting new policies into City and Regional Official Plans is a delay tactic.

1991: Although the LCWS is not yet complete, the Watershed Study consultants, Watershed Study Technical Committee, and City staff claim that designating the Waterloo West Side area "Urban" will not jeopardize the objectives or the outcome of the Watershed Study process. It also recommends that the site-specific nature of land use designations and development densities be addressed through a City Official Plan amendment and distract plan exercises.

1991: The City of Waterloo publishes the West Side Designation Study Response Paper (City of Waterloo, 1991). The contents of this Response Paper reflect the pressure staff members feel to resolve the West Side Lands Designation issue before it appears at the OMB hearing. Council realizes that if it wants to control development on the West Side, it has to resolve the land use designation issue quickly. Still, it recognizes the need for long term planning before it permits any development on the West Side Lands; development in this area will require major road extensions, and sanitary pump station studies, which are subject to the Environmental Assessment process; water supply studies; and Master Drainage Studies in accordance with District Planning procedures.

Council's lack of capital funds to complete all of these studies results in its decision to take advantage of a provision provided by The Development Charges Act. The Development Charges Act allows cities to collect Development Charges from new developments in order to compensate them for costs incurred as a result of that development; however, according to the Planning Act, no development can occur that does not conform to the Official Plan. Therefore, in order to charge these studies to Development Charges, the city decides to amend the ROPP to include the West Side Lands in the urban designation.

1992: A public meeting is held pursuant to Section 17(2) of the Planning Act (City of Waterloo, 1992). It is a Joint meeting of the Regional Planning and Development/Heritage Resources Committee and City of Waterloo Council. The meeting receives public input on the designation of the City of Waterloo's West Side Lands in the ROPP.

1992: The OMB approves changes to the ROPP Settlement Policy Area "A" (Urban) designation for the West Side Lands. The Region initiates the Waterloo West Side Servicing Study (Regional Municipality of Waterloo, 1993). An analysis and evaluation

of various transportation networks is undertaken and after consideration from public input, an option is recommended by the Project Team.

1993: Regional Council approves the Laurel Creek Watershed Study recommendations and they are incorporated into the City of Waterloo's Official Plan to guide future developments on the West Side (City of Waterloo, 2006).

1994: The Waterloo West Side Services Master Plan is completed (City of Waterloo, 2006).

1996: Regional Council approves an Amendment to the City's OP so that Clair Creek Meadows and Greyerbiehl properties may receive residential designation (Region of Waterloo, 2006b).

1996: Subwatershed Studies are completed for Subwatersheds 309, 313, and 314. The Columbia Hills District Plan is completed (City of Waterloo, 2006).

1996: The City approves the Clair Hills and Columbia Hills District Plans for lands between Erbsville Road and The Wilmot Line (City of Waterloo, 2004).

1997: The Columbia Street Extension Class EA is completed and an alignment design for the Columbia Street Extension is finalized (Region of Waterloo, 2006b).

1997: Greyerbiehl lands are designated by the City's OP for residential purposes (Region of Waterloo, 2006b).

1997: Vista Hills submits a Draft Plan of Subdivision application to the Region for circulation and review (Region of Waterloo, 2006b).

1998: A Class EA is initiated for the intersection at Erb Street and The Wilmot Line. As recommended by the Columbia Extension EA, this Class EA recommends road specification for an increase in traffic volume (Region of Waterloo, 2006b).

2002: The Erb Street/Wilmot Line Class EA is halted by the Region in anticipation of preliminary plans for lands designated industrial between Erb Street and the subject properties (Region of Waterloo, 2006b).

2003: In response to public concerns, property owners submit revised Draft Plans without road access to the Wilmot Line. Council concludes that the revised Draft Plans do not conform to the Columbia Hills District Plan because it does not connect to the Wilmot Line. Council directs staff to undertake a review of those portions of the Columbia Hills and Clair Hills District Plans adjacent to the Wilmot Line, along with a West Side traffic study to evaluate transportation models for the future subdivisions adjacent to the Wilmot Line and the broader West Side road network. The District Plan Review examines the opportunities and implications of developing these lands without road access to the Wilmot Line (City of Waterloo, 2006).

2003: Meetings with residents are undertaken to seek input on the Terms of Reference for the District Plans Review and the Traffic Study (City of Waterloo, 2004).

2004: Modifications to the Columbia Hills and Clair Hills District Plans are approved by Council. These modifications include a road pattern without access to The Wilmot Line (City of Waterloo, 2006).

2004: In February, an informal public meeting is held to discuss the District Plans Review Discussion Paper (Region of Waterloo, 2006b).

2004: In April, an Open House is undertaken to seek input on Phase 2 of the Traffic Design Analysis (Region of Waterloo, 2006b).

2004: City Council hosts a public meeting to seek input into the West Side Plans Review Final Report. Council adopts recommendations to amend the Columbia Hills and Clair Hills District Plans to include a road design that excludes access to the Wilmot Line (Region of Waterloo, 2006b).

2005: Draft Plan of Subdivision applications are submitted for Vista Hills, Clair Creek Meadows, and Greyerbiehl, based on the modified District Plans (City of Waterloo, 2006).

2005: The City holds an open house for input on the newly proposed draft plans (Region of Waterloo, 2006b).

2006: The City, Region, and Township of Wilmot re-initiate the Erb Street/Wilmot Line intersection Class EA. The scope of the EA is expanded to include improvements to the Wilmot Line, between Erb Street and Columbia Street. Opportunities for public consultation are in accordance with the Class EA process (City of Waterloo, 2006).

2006: Once a solution has been determined to accommodate increased traffic at this intersection, the Region will be in a position to support Draft Approval of the subdivisions. The ROPP mandates that the Class EA must be complete prior to Regional or area municipality approval of the development application (City of Waterloo, 2006).

2006: City Council passes a resolution that recommends approval for the three draft plans subject to a list of conditions. Regional Council receives the draft plans for consideration. The Region has approval authority (Region of Waterloo, 2006b).

Test #2: Applying the final generic land use decision making criteria to the case specific context of the Waterloo Moraine land use issue

The practical strengths and limitations of the final generic land use decision making criteria (Box 4) were investigated by applying them to the case specific context of

Waterloo Moraine land use issue. The discussion that follows describes how the final generic criteria addressed or did not address the key concerns in the subject land use issue. Key concerns that were not addressed revealed where the criteria could be improved, thereby indicating the practical strengths and limitations of radical green political theory in the context of the Waterloo Moraine land use issue. Box 5 summarizes the key concerns discussed in Chapter 3.

Box 5. Summary of key concerns

Type of Concern	**Summary**
Urban growth	• Maintenance of rural identity • Maintenance of quality of life • Maintenance of tradition of stewardship of natural features
Water quantity and quality	• Maintenance of pre-development condition of surface water flow • Maintenance of pre-development condition of recharge soils • Maintenance of pre-development recharge levels to deep aquifer • Long term monitoring of Clean Water Collection system • Maintenance of pre-development quality of surface water and groundwater • Maintenance of thickness of clay till cap
Traffic	• Air quality • Noise • Impact of increased traffic on ESPA network • Appropriate road design
Ecological integrity of ESPA network	• Maintenance of connectivity • Ecological integrity of Provincially Significant Wetlands • Ecological integrity of ESPA 19 • Impact of development on flora and fauna
Appropriate development	• Appropriate development of Constraint Level 1, 2, and 3 areas
Procedural, Structural, Economic	• Adherence to Ontario Planning Act • Adherence to ROP and City of Waterloo OP • Adherence to structure of decision making for Plan of Subdivision Approval • Finances for infrastructure studies • Finances for Environmental Assessments

Urban growth

Quality of life concerns and issues pertaining to cultural identity and tradition are accommodated and supported by the criteria's underlying fusion of socio-biophysical systems. In particular, these concerns are addressed by the criterion that asserts that land

use decision making must favour present options and actions that are most likely to preserve and enhance the opportunities and capabilities of future generations to live sustainably; the criterion that seeks to ensure that every community has enough for a decent life; the criterion pertaining to the maintenance and protection of socio-ecological diversity and longevity; the criterion that speaks to the equal representation of socio-biophysical units in decision making; and the criterion that guides decision makers during time of conflict and compromise. It might be argued that the criteria's fusion of social and ecological and biophysical systems only implicitly includes issues pertaining to cultural identity and tradition. The criteria might be strengthened, then, by explicitly addressing these types of issues. This type of improvement, however, may risk separating cultural issues from socio-ecological systems.

Water quantity and quality

The criteria address water quality and quantity concerns. In particular, concerns for long term monitoring and the maintenance of pre-development conditions of surface water quality and quantity, recharge levels, recharge soils, and the clay till cap are accommodated by the criterion pertaining to protecting the longevity of the socio-biophysical systems involved; the criterion that encourages land use decision making to develop small, decentralized, self-reliant communities that respect the carrying capacity of surrounding socio-ecological systems; and the criterion that asserts that during times of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of the longevity of the socio-biophysical systems involved. The concern for monitoring the Clean Water Collection system is supported by the criterion that asserts that decision makers must adopt a precautionary approach to the use of technology.

Traffic

Air quality, noise, impacts of increased traffic on ESPA network, and appropriate road design may all be addressed by the final generic criteria. Specifically, these issues are accommodated by the criterion that stresses that land use decision making must adopt a systems approach that is oriented toward respecting the temporal and spatial interdependencies within and between socio-biophysical systems; the criterion that stresses land use decision making that is inclusive of the socio-biophysical units in each case; and the criterion that asserts that during times of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of the longevity of the socio-biophysical systems involved. The overall emphasis on socio-ecological systems is especially appropriate for addressing the interconnections between traffic volume, road design, and issues pertaining to air quality and the ecological integrity of the ESPA network.

Ecological integrity of ESPA network

Similar to traffic and water issues, the issues pertaining to the ecological integrity of the ESPA network are addressed by the criterion that stresses that land use decision making must adopt a systems approach that is oriented toward maintaining socio-ecological diversity, respecting the temporal and spatial interdependencies within and between

socio-biophysical systems, and protecting the longevity of the socio-biophysical systems involved in the case; the criterion that stresses land use decision making that is inclusive of the socio-biophysical units in each case; and the criterion that asserts that during times of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of the longevity of the socio-biophysical systems involved. This issue and the issues pertaining to water and traffic are also implicitly addressed by the criterion that asserts that land use decision making must work towards outcomes that are not human instrumental.

Appropriate development

As previously discussed, concern for sustainable development in the Waterloo moraine case is oriented towards appropriate development for Constraint Level 1, 2, and 3 areas as recommended by the Laurel Creek Watershed study. Overall, the final generic criteria address this concern. In particular, five criteria work to address concerns for appropriate development on the West Side: the criterion related to systems thinking; the criterion that promotes the inclusion of socio-biophysical units in decision making; the criterion that promotes the development of small communities that respect carrying capacity of surrounding socio-ecological systems; the criterion that asserts that land use decision making must favour present options and actions to enhance the capabilities of future generations to live sustainably; and the criterion that asserts that during times of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of the longevity of the socio-biophysical systems involved.

Procedural, structural, and economic issues

Socio-economic issues are explicitly addressed by the final generic criteria; however, they are implicitly oriented toward issues pertaining to the distribution of resources and other goods and services, as well as class divisions. Specifically, these types of socio-economic issues are addressed by the criterion that stresses that everyone and every community must have enough for a decent life; the criterion that asserts that decision making must ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity between the rich and the poor; and the criterion that protect the capability of future generations to live sustainably.

But the economic issues met by the Waterloo Moraine land use issue were chiefly budget issues; the City did not have the budget to implement the infrastructure and environmental assessment studies for the West Side lands. The criteria do not explicitly or implicitly address budget constraints. The previous discussion on critiques of deep ecology and ecologism, therefore, can be repeated here: ecologism's ecocentric bias may minimize attention to the roles played by economic and social justice factors in environmental degradation.

Procedural and structural issues are explicitly addressed by the criterion that asserts that all of the phases, structures and processes of land use decision making must be oriented towards inclusive and equal engagement and representation of the socio-biophysical units in the systems involved. Moreover, this criterion emphasizes a preference for well informed deliberations, reciprocal awareness and collective

responsibility, and more integrated use of administrative, market, customary and personal decision making practices.

But the criteria do not explicitly address the legal, planning framework within which these structures and processes exist. The obligations dictated by this planning framework had a profound impact on the Waterloo Moraine land use issue. The timeline demonstrates how the landowners used the Ontario Municipal Board to their advantage for the lands designation issue. It also demonstrates how the Region and the City might employ the ROP for land use purposes. The criteria, then, might be strengthened by adding criteria related to the legal, planning framework within which land use planning operates. Such criteria, however, might be rendered ineffective because they would not be legally binding. Moreover, because of the case specific nature of land use issues, planning law may need to be adjusted to allow for flexible case-by-case applications in order to ensure sustainable development. This is not currently possible, or even desirable, under most legal systems. Still, if planning law can impede progress towards sustainable development, it might be worthwhile, as an experiment, to develop criteria that address issues pertaining to legislated planning frameworks and encourage steps to reduce these barriers.

Test #2 results: overall strengths and limitations of the final generic land use decision making criteria

The final generic criteria did not address concerns pertaining to the procedural, structural, and economic issues in the subject land use issue. Specifically, they did not address the potential socio-ecological implications of Regional and Municipal concerns to follow the legislative planning framework. Nor did they address issues pertaining to budget constraints. Rather, the final generic criteria were more geared towards broader socio-economic and political issues, such as the distribution of resources, class divisions, and the capability of future generations to live sustainably. These results support those of the first test; ecologism's ecocentric bias limits its ability to acknowledge the socio-economic and political factors in land use decision making. The results also suggest that the final generic criteria are too broad for some of the finer details related to land use decision making.

Ecologism's underlying theme of anti-anthropocentrism and ecocentrism may also underlie its lack of explicit attention to cultural identity and tradition. This neglect may be indicative of ecologism's wish to dismantle and reconstruct the paradigms that dominate industrialized societies. Again, in this manner, cultural identity and tradition are implicitly recognized as a part of the problem and part of the solution. Cultural identity and tradition are also implicitly included in ecologism's desire to protect socio-ecological systems. But the lack of explicit attention to cultural identity and tradition may work towards rendering radical green political theory ineffective in countries where cultural identity and tradition are complicated by myriad factors, such as colonialism and ongoing foreign exploitation of natural resources (e.g., Shiva, 1988; Mawdsley, 1998; Martinez-Salazar, 1999).

The strengths of the final generic criteria also support the first test findings; ecologism's faith in the limits to growth thesis, science of ecology, systems thinking, and ethical theory underpin the fusion of socio-ecological systems in decision making.

Therefore, it was not difficult for the criteria to address issues pertaining to water quality, traffic, ESPA integrity, some aspects of urban growth, and sustainable development.

Evaluation of land use decision making in the Waterloo Moraine case

The revised set of generic land use decision making criteria (Box 4) were employed by this study to evaluate the decision making undertaken at the Municipal and Regional level in the subject land use issue. Results may indicate where the Region and the City might improve in land use decision making for sustainability, thereby providing practical advice for land use decision making in this area. Results may also work towards highlighting the distance between standard land use decision making and land use decision making informed by radical green political theory.

Future research might take these results a step further by interviewing members of Regional and Municipal Staff and Council in order to discover the openings and obstacles for the City and the Region to adopt aspects of the final generic criteria for future land use decision making.

For the purpose of this investigation, the final generic land use decision making criteria were evaluated separately in relation to the subject land use issue.

Criterion 1:

"Land use decision making must adopt a systems approach that is oriented toward maintaining socio-ecological diversity, respecting the temporal and spatial interdependencies within and between socio-biophysical systems, and protecting the longevity of the socio-biophysical systems involved in each case."

Overall, Municipal and Regional level decision making do not fulfill this criterion. The City and the Region initiated subwatershed studies and the Laurel Creek Watershed Study in preparation for development on the West Side. EAs and Class EAs where also undertaken where appropriate. As previously discussed, the Laurel Creek Watershed report asserted that there is a "need to better understand the connectivity and functions of all parts of the Watershed stream system so that future planning and development can avoid negative impacts" (City of Waterloo, 1992b, preface).

Implicit in these undertakings, then, was an effort to protect the ecological or biophysical components of the systems involved in the Waterloo Moraine land use issue. Further research is required to determine whether or not a systems approach was explicitly adopted for the above studies and if this systems approach was underpinned by the literature. The EA study undertaken by the City demonstrated a bias towards the ecological or biophysical side of socio-biophysical systems. Social concerns, such as quality of life and maintenance of rural cultural traditions, for example, were not included in the EA (see Planning & Engineering Initiatives Ltd. et al., 2004).

Criterion 2:

"All of the phases, structures and processes of land use decision making must be oriented towards inclusive and equal engagement and representation of the socio-biophysical units in the systems involved in each case and must build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through

more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices"(Gibson et al., 2005).

Overall, Municipal and Regional level decision making do not fulfill this criterion. As illustrated in the timeline, the Region and the City followed the stipulations of Ontario Planning Act for obtaining public input into the EA and subdivision design process. They also help many open houses and public information sessions. More research is required to determine if the stakeholders involved in these public discussions felt that the process was inclusive and fair in terms of equal opportunities for voicing concerns. Similarly, more research is required to determine if the citizens felt that they were well informed. During the September 27th, 2006, Regional public meeting, it was witnessed that Council gave equal time to each citizen presentation; however, the time allotted for each citizen was sometimes too short.

During public meetings, representation of socio-biophysical units may be the responsibility of both public and citizen actors in decision making. Citizen presentations during the September 27th public meeting revealed that citizens may be dealing with social and ecological issues separately; therefore, the City and Region may also be dealing with them separately.

Again, more primary research is required for fair evaluation of the decision making process in relation to this criterion. However, the September 27th public meeting revealed that the participatory element of decision making at the Regional level is not geared towards collective decision making, open deliberations, reciprocal awareness and collective responsibility, and a more integrated use of administrative, market, customary and personal decision making. Rather, public participation centred on Council listening to citizen presentations and asking some questions regarding their presentations.

Criterion 3:

"During times of conflict and compromise, the onus of justification must be placed on those participants who wish to interfere with the maintenance of socio-ecological diversity, respecting the temporal and spatial interdependencies within and between socio-biophysical systems, and the protection of the longevity of the socio-biophysical systems involved."

Overall, current Regional and Municipal decision making do not fulfill this criterion. As illustrated by the timeline, the West Side developers were impatient to change the 'Rural' status on their lands. In order to speed up the land designation process, they took their case to the OMB. This put the Region in an awkward position; it realized that it had to figure out a plan or the West Side before the OMB trial. Hence, the Laurel Creek Watershed Study was initiated.

This example of compromise between the developers and the Region illustrates that the "onus of justification" in the Waterloo Moraine land use issue was not on the developers; they merely followed the legal planning protocol to pursue their interests. Rather, the Region and the City assumed that the environment would be impacted and thus braced itself for the task of managing and mitigating these impacts. In fact, as revealed by the timeline, the onus of justification during times of conflict was placed on the citizens who rejected the subdivision proposals because of the impacts they would have on water, ESPA#19, etc.

Furthermore, any effective "onus of justification" element in land use decision making must enter at the beginning of the decision making process, when applications are made for subdivision approval. This process did not stipulate that applicants must justify their proposal on the basis that it would not interfere with the maintenance of socio-ecological diversity, etc.

Criterion 4:

"Land use decision making must work towards outcomes that are non-human-instrumental."

Overall, Regional and Municipal decision making do not fulfill this criterion. Although care was taken to consider the ecological impacts of development on the West Side and consideration for flora and fauna and hydrology, etc., were incorporated into subdivision design, decision making was always oriented towards figuring out how to incorporate the subdivisions into the West Side for residential housing needs—without damaging ecosystem goods and services valuable to local residents.

This criterion is contentious because the majority of land use is essentially human-instrumental, whether it is used for resource extraction, housing, or for recreation; therefore, even though this criterion may be derived from radical green political theory for the purpose of this study, it may not be appropriate for the Waterloo Moraine land use issue. This impracticability indicates that radical green political theory stretches the envelope a bit too far for some land use issues. There may be different degrees of human-instrumental land use, however, as suggested by Dobson's (2000) discussion of the different degrees of anthropocentrism. Environmentally sensitive subdivision designs, then, might be less human-instrumental than subdivision designs that are not environmentally sensitive.

Criterion 5:

"Land use decision making must work towards the development of small, decentralized, self-reliant communities that are defined by bioregional boundaries and respect the limits of immediate and surrounding socio-ecological systems so that the carrying capacity of a given area is not exceeded by land use, population level, and resource consumption and extraction."

Although the Region an the City did undertake EAs, Class EAs, traffic impact studies, subwatershed studies, and the Laurel Creek Watershed Study, Regional and Municipal decision making do not meet this criterion. This is mostly due to the fact that the above studies were not oriented towards the development of small, decentralized, self-reliant communities defined by bioregional boundaries, etc. It may be argued that these studies intended to ensure that the carrying capacity of the surrounding and immediate socio-ecological systems was not exceeded; however, there was no evidence to suggest that carrying capacity was a key consideration of these studies. This may be because carrying capacity is difficult to calculate due to lack of ecological knowledge, data and uncertainty.

Criteria 6,7,8,9:

"Land use decision making must ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity" (Gibson et al., 2005).
"Land use decision making must ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor" (Gibson et al., 2005).
"Land use decision making must favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably" (Gibson et al., 2005).
"During all phases of land use decision making, decision-makers must adopt a precautionary approach to the use of technology, respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise and manage for adaptation" (Gibson et al., 2005).

Again, uncertainty and lack of ecological data and knowledge may complicate the fulfillment of these criteria. Nevertheless, they remain unfulfilled by Regional and Municipal decision making. There are many examples in the Moraine land use issue to illustrate this finding. According to Frind (2006), for example, groundwater and surface water sources are significantly threatened by the subdivision development. In particular, there is uncertainty surrounding the perforated pipe system. It is uncertain, therefore, if the subject subdivisions will have adverse impacts on water quality and quantity for future generations. Future impacts may have severe implications for the ability of future generations to live sustainably, to pursue a decent life, and for gaps in sufficiency and opportunity between the rich and the poor. In cases of uncertainty, the final criteria assert that a precautionary approach should be applied. Additionally, the criteria assert that poorly understood risks should be avoided. The subdivisions, however, continue to include the perforated pipe system in design and the Region is currently reviewing the Draft Plan of Subdivisions for approval.

Criterion 10:
"Land use decision making must apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains" (Gibson et al., 2005).

Regional and Municipal land use decision making do not meet this criterion. The other criteria above were not fulfilled; therefore, land use decision making in the subject case cannot possibly apply all principles of sustainability at once, for mutually supportive benefits and multiple gains.

Results of evaluation of Regional and Municipal land use decision making
None of the criteria was met by Municipal and Regional decision making. This indicates that there is a significant distance between current land use decision making in the Region of Waterloo and land use decision making underpinned by radical green political theory. One of the barriers to achieving the above criteria was that both the Region and the City did not consider the socio-ecological impacts of the subject developments. Rather, according to the City's EA, the Subwatershed Studies, and the Laurel Creek Watershed Study, they considered only the potential ecological impacts of the

subdivisions. Overall, then, the decision making demonstrated a significant disconnect between ecological systems and human systems.

This disconnection contributed to the inability of the Region and the Municipality to fulfill the criterion related to participatory decision making. Another barrier to achieving this criterion was the legislative planning process in Ontario. The Region and the City followed the stipulations of this planning framework with regards to public participation; therefore, both levels of government were driven by this legal requirement and not an ethical standard, such as that prescribed by radical green political theory, which calls for more active citizen engagement in decision making.

Another glaring deficiency with regards to fulfillment of the above criteria was that both the Region and the Municipality favoured going ahead with the subject development proposals rather than avoiding potential future impacts because of uncertainty surrounding technological and ecological issues. The precautionary principle, then, was not a significant part of the decision making process. One barrier to fulfilling the criterion related to uncertainty and precaution was that the planning legislative framework in the '80s allowed the developers to pursue their interests through the OMB. Pressure from the OMB decision and the developers, therefore, contributed to the lack a precautionary approach and lack of respect for uncertainty.

Because the final generic criteria did not acknowledge issues pertaining to budget constraints, it is not possible to consider the Region's financial barriers to sustainable development here. This, again, indicates the limits of ecologism's ecocentric bias. The above results also support the results of the first two tests in that a significant barrier to fulfilling the above criteria was the legislative planning framework.

Conclusion

The conclusions of both tests and the results of the evaluation of Regional and Municipal land use decision making consistently revealed that ecologism's overarching themes of ecocentrism and anti-anthropocentrism contribute to both the strengths and limitations of radical green political theory. These two themes underpin ecologism's bias towards the non-human world and this bias determines ecologism's ecocentric orientation towards the key components of the ideology.

Test #1 revealed that ecologism's underlying themes limit its capacity to acknowledge many of the socio-economic and political factors in achieving sustainability; the preliminary generic criteria derived from ecologism did not address Gibson et al.'s (2005) criteria pertaining to sufficiency and opportunity, disparities between the rich and the poor, the capabilities of future generations to live sustainably, participatory decision making, precaution and adaptation, and applying all principles of sustainability at once. However, the same themes, which include the notion of extending the moral community around non-humans, systems thinking, and the science of ecology, permit the criteria to represent the human, ecological and biophysical components of a system as units—as functional, socio-ecological or socio-biophysical constituents within a whole system.

Test #2 revealed similar strengths and limitations due to ecologism's overarching themes. The fusion of socio-ecological or socio-biophysical systems, underpinned by ecologism's emphasis on systems thinking, the science of ecology, and its ethical theory, surfaced again as a major strength; the final generic land use decision making criteria accommodated most of the key concerns in the subject land use case. The concerns that were not addressed support the results of the first test: ecologism's core themes limit its capacity to address the human-centered procedural, structural, and economic factors in land use decision making. The final generic criteria were not able to address the barriers to sustainable development imposed by the OMB, ROP, and financial constraints. This also indicates that the final generic criteria may be too broad for the finer scale issues in land use decision making.

The results of the evaluation of Municipal and Regional decision making in the subject land use case revealed that both levels of government failed to fulfill the final generic land use criteria. This indicates that there is a significant distance between standard land use decision making and land use decision making underpinned by radical green political theory. In particular, Regional and Municipal authorities did not conceive the ecological and social aspects of land use decision making as fused issues; they did not apply a precautionary approach when faced with uncertainty and poorly understood risks; and public participation was limited to opportunities provided by the legislative planning framework. Again, significant barriers were the OMB, ROP, and financial constraints. The results of the evaluation supported the first two tests in that the financial (budget constraints) barriers to sustainable land use decision making were not addressed by the final generic criteria.

Aside from ecologism's ecocentric bias, the above conclusions indicate that ecologism may be too narrowly focused on certain aspects of developing an alternative paradigm to the dominant paradigms of industrialized nations. This focus on developing alternative paradigms lends to the preliminary and final generic criteria a coarseness that cannot address the finer elements of land use decision making.

Recommendations

To become more practical for sustainable land use decision making, radical green political theorists must begin to reach beyond the broad concepts and theories that underpin its prescriptions for a sustainable society and temper its themes of anti-anthropocentrism and ecocentrism by focusing more on its orientation towards the micro-scale real life dilemmas associated with land use issues. Future questions for radical green political theorists might include:

a) What kind of planning legislative framework might radical green political theory espouse?
b) What kinds of rules might be applied to environmental decision making during times of conflict and compromise?
c) How might the process of participatory decision making work according to radical green political theory?
d) How might radical green political theory work to address the institutional financial barriers to sustainable development?

e) How might radical green political theory incorporate broad, human-centred, socio-economic and political issues into its ideology?

By answering these questions, radical green political theory might, by extension, become more practical for environmental decision making in general. To answer these questions, green political theorists might turn to the literature surrounding the practice of environmental assessment and decision making criteria for sustainability (e.g., Gibson et al., 2005). Additionally, they should look inward to ecologism to answer the above questions. Certainly, ecologism's key components may be expanded to incorporate the above deficiencies of the land use decision making criteria into the ideology. Ecologism's preference for participatory democracy, for example, can be expanded to include a particular view of how deliberative processes should unfold. Similarly, ecologism's theory of need might be expanded to include issues pertaining to disparities between the rich and the poor, and the distribution of goods around the world.

Sustainable land use decision making in the Region of Waterloo might be enhanced if the Region were to adopt a systems approach to land use issues, underpinned by the literature. It should also be sure to fuse the ecological and social components of land use problems. The participatory aspect of land use decision making at both levels of government might benefit from deliberative democracy theory (e.g., Smith, 2003), which may provide guidance for alternative decision making structures and processes. It would also benefit from adopting a precautionary approach to land use decision making. Overall, the Region might be better equipped to achieve sustainable development through land decision making if it adopted the final generic land use decision making criteria developed by this study. Future research should work to reveal the practical and institutional implications of incorporating these recommendations into Regional and Municipal land use decision making.

Epilogue

In June 2006, members of the Citizens for the Protection of the Waterloo Moraine submitted an Application for Review to the Environmental Commissioner's Office under section 61 (2) of the Environmental Bill of Rights. This Application for Review requested that the Minister of Natural Resources (MNR), Minister of Municipal Affairs and Housing (MAH), and the Minister of the Environment (MOE) consider whether or not there is a need to develop new provisions to protect groundwater and sourcewaters in the Waterloo Moraine. The response from the MNR was that a review is not warranted because source water protection issues and municipal land use planning statutes and policies do not fall within its legislative mandate. The response from the MAH was that a review is not warranted because current policy, specifically the Provincial Policy Statement, 2005, effectively covers water quantity and quality protection concerns. The MOE, however, granted a review based on Bill 43, the Clean Water Act. Under the provisions of the Clean Water Act, communities can develop and implement plans to protect the quality and quantity of municipal drinking water sources. It also recognizes the provisions of the Provincial Policy Statement (PPS) that work to protect natural heritage features, including water resources.

The MOE review will take 16 months. Meanwhile, Class EAs continue for the Erb Street/Wilmot Line intersection, the final step in the Draft Plan of Subdivision

Approval process. At the time of this writing, it is unknown as to whether or not Regional and Municipal Councils will stall the approval process for the results of the MOE review. Concerned citizens, however, continue to appear at public meetings to urge Councils to reconsider the harmful effects of development on the Waterloo Moraine.

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