

Enhancing Nature Conservation on Private Land in Nova Scotia: A Case Study

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Abstract

Conservation of nature is vital to the maintenance of the ecological integrity and biodiversity of the Earth. Yet our current approaches to protecting nature are inadequate, and many are no longer politically, technically, or economically feasible. Existing protected areas may not be ecologically viable in the long term because of their size, isolation, fragmentation and impacts from surrounding land uses. Furthermore, in many areas of southern Canada, including Nova Scotia, there is a significant proportion of private land. These private lands contain many significant sites and features, and face serious threats.

Private land conservation is one alternative that has been used successfully throughout North America to complement traditional conservation efforts, and to enable an ecosystems-based approach to environmental management. It may offer great potential in Nova Scotia, but there is little supporting research. Existing studies for other regions have identified several variables or issues which influence private land conservation. There is little consensus, however, among these studies, particularly between different geographic areas. In addition, no specific studies on private land conservation exist for Nova Scotia.

The purpose of my study was to help close this research gap and to identify the important issues surrounding private land conservation within the Nova Scotian context. My research involved a case study, in which I worked with landowners and conservation professionals to identify these issues, and to make recommendations for addressing them. The most significant issues identified were: the need for data upon which to base private land conservation efforts; economic obstacles to private land conservation; a lack of supportive attitudes and knowledge; a lack of economic, legal, political and public support for private land conservation; the need for adequate and appropriate mechanisms to support private land conservation efforts; the need for integrated planning and coordination of efforts; and the need for a landowner-centered, community-based approach. The main recommendations focused on the following: gathering information on private lands of conservation value, as well as providing funding, an incentive program (including property and income tax breaks), adequate and appropriate conservation tools and institutional options, training opportunities for conservation professionals, landowner education through a landowner contact program, and public education programs on private land conservation.

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1. CHAPTER ONE: INTRODUCTION

1.1 Background

Conservation of nature is vital to the maintenance of the biodiversity and ecological integrity of the Earth. Fortunately, global, national and regional recognition of these values is increasing. There is also recognition of the need for immediate action in the face of increasing threats to the natural world and its processes (Amos 1995; World Commission on Environment and Development 1987; World Conservation Union et al. 1991).

At the same time, it is acknowledged that traditional conservation philosophies and approaches are inadequate to meet conservation goals (Beatley 1994; Board on Environmental Studies and Toxicology and Commission on Life Sciences 1993; Carruthers 1989; Filyk 1992; Hilts 1989). A broader array of conservation approaches must be adopted to complement existing efforts. These approaches could expand and improve the protected areas system where public acquisition and management are no longer politically or economically feasible (Deblinger and Jenkins 1991). Future efforts will need to focus on the use and management of the entire landscape, through an ecosystem-based approach and application of the principles of conservation biology (Biodiversity Science Assessment Team 1994; Canadian Environmental Advisory Council 1991; Council on Environmental Quality 1981; Dottavio et al. 1990; Grumbine 1990a; Gwynne 1982; Holland 1993; Hudson 1991; Locke 1993; Martinka 1992; Merriam 1993; Slocombe 1993). Since an ecosystem-based approach must consider lands outside traditionally protected areas, and must obtain the cooperation of surrounding landowners and resource users, conservation efforts face a significant challenge. There is a large amount of privately owned land in southern Canada, containing many of the most biodiverse and ecologically significant areas of the country, as well as the most threatened areas (Biodiversity Science Assessment Team 1994; Rubec 1995). Private land conservation will therefore be important in addressing the conservation challenges facing traditional philosophies and approaches.

The conservation literature and the strategies and plans that guide conservation efforts, advocate the need for private land conservation. At the Federal level, the Protected Areas Vision for Canada, the Federal Government Green Plan, the Endangered Spaces

Campaign of the World Wildlife Fund (Canada), and the National Biodiversity Strategy all recognize the vital role of private land conservation in natural heritage protection (Canadian Environmental Advisory Council 1992; Canadian Society of Environmental Biologists 1987; Dearden and Rollins 1993).

Within Nova Scotia specifically, this recognition is apparent in the proposed Parks and Protected Areas System Plan; the Special Places Program; and the Sustainable Development Strategy (Burnett and Hundert 1994; Leduc and Smith 1992). Natural heritage protection in Nova Scotia centers upon the Parks and Protected Areas Systems Plan. This plan, however, addresses only crown lands in the Province. The remaining 73% of the Province is privately owned so many of its unique natural landscapes, rare and endangered species and other important elements of natural heritage are not protected. Private land conservation is an essential complement to the systems plan (Burnett and Hundert 1994; Leduc and Smith 1992; Smith 1996).

Not only does private land conservation enhance traditional nature conservation efforts by expanding and complementing the protected areas network, but it may also increase public involvement in and support for conservation. Because it is based on education and landowner involvement in the conservation process itself, private land conservation can help to instill an awareness of environmental issues, and a sense of responsibility for protecting natural heritage (Filyk 1992).

1.2 Problem Definition and Research Questions

Private land conservation has been shown to be a valuable and successful tool for natural heritage protection across North America, and throughout the British Commonwealth (Brusnyk et al. 1990; Elfring 1989; Filyk 1992; Hilts 1993a; Moull 1989). It may also hold great potential for Nova Scotia. However, there is currently little research on private land conservation that is directly applicable to Nova Scotia. Existing research from elsewhere suggests that the variables influencing private land conservation vary considerably across geographic, cultural and socio-economic strata. The prevalence and magnitude of these issues must therefore be examined in a situation-specific context to determine how to approach private land conservation in Nova Scotia.

The purpose of this study was to examine the issues involved in private land conservation in Nova Scotia and to assess how to address these issues. The research brought together the broad issues presented in the literature on private land conservation, and the specific issues relevant to private land conservation in Nova Scotia revealed through a case study in Hants County.

Problem Statement:

How can nature conservation on private land in Nova Scotia be enhanced?

Research Questions:

- 1) What are the important issues influencing private land conservation in Nova Scotia?

To address this research question, I surveyed landowners and individuals who are professionally involved in private land conservation efforts. I asked a number of sub-questions to examine:

- 1.1) What are landowner attitudes related to private land conservation?
 - 1.2) What is landowner knowledge related to private land conservation?
 - 1.3) Which conservation tools are appropriate for Nova Scotia?
 - 1.4) Which institutional options are appropriate for Nova Scotia?
 - 1.5) What factors encourage participation in private land conservation?
 - 1.6) What factors discourage participation in private land conservation?
 - 1.7) What are the challenges facing private land conservation efforts?
 - 1.8) What recommendations can be made to enhance private land conservation?
 - 1.9) What variables relate to participation in private land conservation?
- 2) What actions can be taken to address these main issues?

1.3 Operational Definitions

Several important terms used in this research are defined below.

Natural areas refer to those areas that are relatively undisturbed in which natural processes dominate, or areas in the process of recovery from human disturbance.

Protected Areas are those natural areas designated and managed to preserve natural heritage. The term usually refers to formally designated areas such as parks and nature reserves, or land owned and managed by non-governmental organizations.

A Protected Areas System is a network of protected areas planned and managed based on the concept of representativeness of all ecological regions on the relevant scale. Such a system uses gap analysis to determine system needs. It is also usually based on a goal of protecting a particular percentage of the landscape. A protected areas system may include both formally designated protected areas as well as other types of protected spaces such as private land under a conservation agreement.

Nature Conservation refers to the management of human use of the natural world to ensure sustainability of nature, and to ensure sustainable benefits to current and future generations. Nature conservation has two common interpretations: **preservation**, or the more ecological interpretation based on long term protection of natural heritage; and **stewardship or resource conservation**, the more utilitarian interpretation based on land management with rational and efficient exploitation and wise use of natural resources. My research focuses on the former, however it also includes the latter since this type of conservation is an essential complement to preservation-based efforts.

Property refers to a system or bundle of rights that represents all the uses and benefits to which the owner is entitled. Examples include timber, subdivision, development, mineral and water rights. These rights can be separated and shared between a number of parties or held in fee simple interest (outright ownership of all rights).

Private property (private land) represents the right of an individual (as opposed to the crown) to exclude others from some use or benefit that he or she enjoys. The individual is free to decide how the property is used, if and when it will be sold or donated, and who may enter the land. Although private land includes all non-crown ownership, private land for this thesis refers only to family-owned lands. Lands owned by businesses, corporations, and holding companies were excluded.

Private Land Conservation refers to the protection of natural heritage on private lands. It implies a sense of caring for the land, and appreciating its diverse ecological, social, cultural, historical and intrinsic values. Private land conservation may involve a form of stewardship, in which a landowner commits to taking an active responsibility for his or her land and to manage it for conservation. It may also involve a stronger form of protection such as a legal agreement, or sale or donation of land or certain property rights to conservation interests. Private land conservation may include variations on ownership, use, and responsibility for the management and long term protection of the land.

Private Land Conservation Tools include any mechanism that can provide and encourage private land conservation, including various combinations of ownership, management and use rights, agreements, educational initiatives and incentives.

Institutional Arrangements/Options refer to the organizational and administrative mechanisms through which private land conservation may take place. They may include various institutions such as government agencies or departments, cooperative government and non-government coalitions, non-government organizations such as land trusts, conservancies, naturalist groups, and local community interest groups. The term also includes the powers and responsibilities of such groups and their capacity to provide conservation tools and incentives to landowners, and to provide a process and framework for conservation.

1.4 Organization of Thesis

This thesis contains seven chapters, including this introductory section. The following chapter provides a more in-depth discussion of the current challenges facing conservation in Canada, and in Nova Scotia specifically. It also outlines the need for private land conservation and its important benefits. The third section provides a background on private land conservation, including options available for encouraging participation and providing conservation opportunities. The final section of the literature review outlines research needs and recommendations for addressing my research questions, based on existing studies.

Chapter three includes a brief description of my case study area. Chapter four describes my research methods. Results and discussion of the study are presented in Chapters five and six. The final chapter provides a conclusion, and a summary of the main issues influencing private land conservation in Nova Scotia, and recommendations to address these issues.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 The Need for Private Land Conservation

The natural world is an integral and essential part of our lives and of the functioning of the systems upon which all species depend for survival. Conservation of the natural world can be justified by numerous ecological, economic, scientific, educational, cultural, aesthetic, spiritual, philosophical, and ethical rationale (Biodiversity Science Assessment Team 1994; Burnett and Hundert 1994; Canadian Environmental Advisory Council 1991; Ehrlich and Wilson 1991; Ehrlich and Ehrlich 1992; Fiedler and Jain 1992; Freedman 1995; Herity 1994; Kim and Weaver 1994; Magurran 1988; McAllister 1991; Noss and Cooperrider 1994; Rolston 1992; Sandlund et al. 1992; Spellerberg 1992). Conservation can also be justified based on the irreversible loss of many species, habitats and ecosystems that has occurred throughout the world as a result of human actions (Soule 1991). Threats to the natural world continue to increase with increasing human population and consumption of natural resources and lands (Noss and Cooperrider 1994; Soule 1991).

Concern about nature conservation and the need for preserving representative examples of the world's natural heritage and biodiversity is increasing. This concern is evident at the global level in numerous recent international conventions, congresses, action plans and reports focusing on natural heritage, biodiversity, and environmental protection (Amos 1995; McNeely et al. 1994; Ryan 1992). Canada's response to global concerns, and its commitment to conservation are visible at both national and regional scales. Evidence includes numerous legislative and policy changes, special initiatives, commitment to international conventions, as well as conservation, biodiversity and protected areas plans and strategies on national and provincial scales (Canadian Environmental Advisory Council 1991; Canadian Society of Environmental Biologists 1987; Dearden and Rollins 1993; Environment Canada 1994; National Biodiversity Working Group 1994; National Roundtable on the Environment and the Economy 1994). Canada is committed to the completion of the terrestrial National Park System by the year 2000, including representative examples of all of the Country's main natural regions. The focus on ecosystems, habitat, and protected areas at recent conferences indicates the level of

academic and professional concern about nature conservation on both national and regional scales. There is also a growing number of non-governmental organizations working for conservation of natural heritage and biodiversity (Bull 1993; Canadian Society of Environmental Biologists 1987; Taschereau 1985; World Wildlife Fund Canada 1991). Canadian citizens also value the natural world. They spend over four million dollars on wildlife-related activities annually, and 90% of the population takes part in one or more such activity each year (Canadian Council of Ministers of the Environment 1991; Canadian Wildlife Service 1993). Public concern about environmental issues, and perceptions that governments and corporations are unable to protect the environment, have persisted over the last decade. Specifically, concerns about conservation and the protection of natural areas have risen dramatically on the public agenda (Cutting and Cocklin 1992; Dearden and Rollins 1993; Leduc and Smith 1992; Lerner 1994).

In recent years there has also been an increasing recognition of the need to move beyond traditional approaches to nature conservation (Beatley 1994; Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Carruthers 1989; Filyk 1992; Hilts 1989). Specifically, private land conservation is recognized as being essential in meeting the goals of the Protected Areas Vision for Canada, the Endangered Spaces Campaign of the World Wildlife Fund, the Canadian Biodiversity Strategy, and many provincial, regional and local conservation efforts (Canadian Environmental Advisory Council 1991; Canadian Society of Environmental Biologists 1987; Dearden and Rollins 1993). Private land conservation is an important component in effective protected areas system planning, to enable representation of all ecological landscapes, ecosystems and habitats and protection of an adequate proportion of the land and water. The specific rationale for private land conservation, and its role in meeting the goals of conservation efforts are outlined below.

2.1.1 Location, Ownership and Use of Important Sites

Throughout southern Canada, as well as in many other countries, there is a substantial amount of land in private ownership (Edwards and Sharp 1990; Rubec 1995). There is also a difference in diversity and quality between crown and private lands. Private

lands contain many of the most biodiverse and ecologically significant areas, as well as the most threatened ecosystems. On a national scale 90% of the most endangered species and habitat are found on private lands (Cox 1995). Southern Canada, particularly Prince Edward Island and Nova Scotia, have the highest number of threatened birds and mammals. They also have the least amount of protected space in the country (Biodiversity Science Assessment Team 1994; Harding and McCullum 1994). These imbalances result from high levels of human exploitation and settlement in the most richly productive parts of the country for agriculture and resource-based activities (Cox 1989). Considering the amount of privately owned lands, the importance of these lands for conservation, and the threats and fragmentation that they face, it is likely that they will play an important role in the overall effort to protect natural heritage.

2.1.2 Need for an Alternative Nature Conservation Approach

The traditional approach to nature conservation centers upon public acquisition and management of protected areas. Both conservation professionals and academics are increasingly aware of the need for alternative strategies to complement these traditional approaches (Beatley 1994; Halls et al. 1991; Keith 1993; Mitchell and Labaree 1991; President's Commission on Environmental Quality 1993).

2.1.2.1 Public Acquisition

Our reliance on public acquisition of natural areas is neither economically, technically, nor politically practical (Edwards 1994; Morgan 1987). The costs and resources necessary to acquire properties, compensate present landowners and lease holders, and then to maintain, monitor and protect a property in perpetuity are increasingly prohibitive (Cox 1995; Filyk 1992). At the same time, conservation efforts must be increasingly efficient in terms of the area conserved per unit cost. There are limited financial resources available for conservation and consequent competition from other priorities for public expenditure (Cutting and Cocklin 1992; Edwards 1994). It is difficult, however, for conservation to be efficient and competitive because the marketplace does not fully reflect biological resources and social benefits of nature. It is also difficult to achieve

measurable results or to demonstrate direct benefits with conservation (President's Commission on Environmental Quality 1993).

There may be a lack of adequate institutional mechanisms and resources available for continued expansion of public acquisition and management of protected areas. Acquisitions require large efforts to protect small and scattered habitats, long bureaucratic processes with difficult political dimensions, and complex and difficult inter-agency cooperation (Filyk 1992).

There are several political and social obstacles to public acquisition. There is increasing public opposition to further land withdrawal for conservation because of the implications for local taxes (Elfring 1989). Rate payers and their elected officials may perceive such land withdrawal as an intrusion on local affairs. There may also be concern about committing lands to the legally entrenched long-term status of a reserve in case such areas are needed for other purposes (Hoose 1981; Taschereau 1985). Many landowners are reluctant to sell their land, or relocate, because of their attachment to the land (Large 1973; Hamilton and Baxter 1977). They may not trust the acquisition process and may perceive it as secretive and political (Evans 1992; Munro 1989). Landowners may see land use planning to protect natural areas as infringing on property rights and as expropriating land without compensation (Van Patter et al. 1990).

As indicated by Keith (1993),

“Conservation of land has always been a contentious issue, with the preservation of natural areas often being juxtaposed against the contradictory forces of progress, jobs and economic development. With continually mounting pressures from urban centers and the industrial sector, this trend is unlikely to reverse.”

The increasing competition for land and resources limits further expansion of the protected areas system even on crown lands (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Keating 1989).

2.1.2.2 Traditional Planning, Design and Management of Protected Areas

The traditional approaches to the planning, design and management of natural areas for conservation are also coming under increasing scrutiny. Protected areas have been established for a number of reasons including: scenery, recreation, and the needs of favoured game animals or “popular” mammals (Hudson 1991; Slocombe 1993). Alternatively, some sites were selected simply because there were no other demands for the land. There are serious implications resulting from this piecemeal and unscientific approach (McNeely and Thorsell 1991).

There has been increasing recognition that existing protected areas may not be viable in the long-term (Freedman 1995). Over 80% of Canada's protected areas are less than 10 km² in area and only 0.7% are larger than 10,000 km² (Biodiversity Science Assessment Team 1994; Dearden and Rollins 1993). Many biologists and ecologists have expressed concern that even the largest of our protected areas in North America, which are among the largest in the world, are inadequate in size. Many are not of adequate size to include all critical habitat for wide-ranging species such as grizzly bears, caribou and wolves (McNamee 1989b). Already some mammal populations have been lost from North American parks (Harding and McCullum 1994; McNamee 1989b). There is even concern that many protected areas may be too small to sustain less space-sensitive species, or to maintain ecological integrity and normal evolutionary processes (Fiedler and Jain 1992; Grumbine 1990b; Hudson 1991; Soule and Wilcox 1980). The isolation of protected areas as habitat islands amidst more developed areas also has significant implications for viability (Beatley 1994; Dottavio et al. 1990). A third issue affecting the viability of protected areas is the inadequate number of such areas. Short-term redundancy in the number of protected areas is essential. Redundancy provides insurance against catastrophic events such as disease, severe weather events, and other potential changes to the ecosystem that might eliminate most of the biodiversity in any one protected area (Freedman 1995; Hudson 1991; Slocombe 1993). The size and shape of protected areas often resulted from individual, pragmatic decisions, political feasibility and other demands for land (McNeely and Thorsell 1991). Little consideration has been given to ecological boundaries or processes, or to current scientific knowledge about the requirements for natural areas

conservation (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Freedman 1995; Hudson 1991, McNeely and Thorsell 1991).

Systems planning, a more recent and more effective approach to protecting natural areas, is based on the establishment of a representative protected areas network. Although it is a valid and important approach, and a step forward from earlier approaches, caution is required in its use. The Brundtland Commission Report suggested a goal of setting aside twelve percent of each country for nature conservation (World Commission on Environment and Development 1987). The Endangered Spaces Campaign of the World Wildlife Fund Canada, the Protected Areas Vision for Canada, and the Federal Government Green Plan subsequently adopted this goal. It was also adopted on a regional scale for many provincial conservation strategies and plans. The goal of protecting 12% of the land can become a "numbers game," which takes the focus off the quality of protected spaces and the need to target critical areas, such as those with high biodiversity or rare species (Biodiversity Science Assessment Team 1994; Rubec 1995). Systems planning that only addresses crown lands, officially designated protected areas, or conservation needs on one particular scale, can result in inadequate protection (Hilts 1989). For example, systems planning based solely on publicly owned protected areas potentially captures only a fraction of biodiversity and likely misses innumerable local and regional sites of ecological significance that are on private land.

In many cases the national and provincial goals of setting aside 12% of the land for protected areas are not even being met. As of 1990, only 3.4 percent of Canada's land has been dedicated to protected landscapes in which logging, mining and hydro-electric power developments are prohibited (Canadian Environmental Advisory Council 1991; McNamee 1989b). Ecoregional representation is also widely disparate, for both national and provincial protected areas (Turner et al. 1992). System plans often aim to protect areas representing each distinct 'ecoregion' on a particular scale. Nationally, 67 out of the total 177 Canadian terrestrial ecoregions are not represented at all in protected areas systems. Eighty-eight ecoregions have less than 12% representation (Dearden and Rollins 1993). Furthermore, there are only a few marine protected areas (Biodiversity Science Assessment Team 1994). Although Canadian data are not presently available, American research

shows that US protected areas do not contain or protect the majority of plant and animal species and habitats (President's Commission on Environmental Quality 1993). The lack of representativeness of protected areas is partly due to the piecemeal manner in which many of them were established, and also to the limitations to expansion of the protected areas system as discussed above.

Protected areas have traditionally been managed based on the old aerial units used to determine park boundaries. They are therefore treated as isolated islands of protected space (Slocombe 1993). Alternatively, they have been managed based on a single species or community focus, or a focus on the needs of park visitors (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Dearden and Rollins 1993; Dottavio et al. 1990). At the same time, funding for management of protected areas has decreased, leading to further degradation of their values, thus threatening their future viability. There are many examples of crown lands across Canada that have suffered a significant decrease in their wildlife value due to lack of appropriate management (Morgan 1987). Ecosystem degradation continues to occur even in our North American national parks (Dottavio et al. 1990; McNamee 1989b).

Traditionally, Canadian legislation for conservation and protected areas has been weak, particularly for provincial protected areas (McNamee 1989a). There is increasing pressure to allow land and resource use in protected areas that may impact ecological integrity. Many protected areas even permit potentially incompatible land-use practices such as resource extraction (Dearden and Rollins 1993; Rankin and McGonigle 1991; Turner et al. 1992). As a result, even if it appears that a certain proportion of the country or ecosystems is represented in a protected areas system, there is no guarantee that in practice such areas are being fully protected. Further, protected areas have not always been managed adequately because there is generally a low level of public accountability over park management. Park managers may also not be able to control all the important impacts on the protected area, many of which originate outside the area (Locke and Mathews 1993). External impacts are particularly difficult to control because of the jurisdictional overlaps and potential gaps in the conservation mandates of various agencies and organizations.

2.1.2.3 The Need for Ecosystem-based Planning, Design and Management of Protected Areas

The interrelated and complex character of natural resource problems, particularly the protection of natural heritage, requires protection and management on larger scales and at broader levels of analysis (Carruthers 1989; Filyk 1992). Current policy and priorities reflect the recognition that effective and long-term protection of natural heritage requires a holistic and ecosystem-based approach, with integrated planning and gap-filling (Attridge 1994; Canadian Heritage-Parks 1992; Canadian Heritage-Parks 1994; Carruthers 1989; Locke and Mathews 1993; Wildlife Minister's Council of Canada 1990). It is necessary to examine the management of larger areas that contain systems of protected areas and sustainably managed spaces working together to protect natural heritage (Canadian Environmental Advisory Council 1991; Johns 1993; Reid and Miller 1989; Rivard 1993).

More specifically, an effective ecosystem-based approach centers upon the concepts of ecological integrity and sustainability, and the application of conservation biology principles (Freedman 1995; Franklin 1993; Grumbine 1990a/b; Slocombe 1993). It therefore recognizes that protected areas are not closed, self-supporting ecosystems, but are part of a larger interacting and interdependent system (Harding and McCullum 1994). Such an approach expands the traditional view of a protected area to define boundaries that provide sufficiently large habitat, diversity and complexity to enable viable populations of all native species to survive (Grumbine 1990a; Rhodes and Chesser 1993; Rowe 1993; Woodley 1993). It focuses on maintaining the sustainability of natural cycles, flows, structures and systems (Merriam 1993; Noss and Cooperrider 1994; Slocombe 1993). Effective natural heritage protection enables continued self-organization and self-maintenance while accommodating natural disturbance regimes (Freedman 1995; Noss and Cooperrider 1994; Rivard 1993). It protects all levels of biodiversity: genetic, species, community and ecosystem (Council on Environmental Quality 1981; Western 1992).

An ecosystem-based approach recognizes that landscape connectivity is necessary to counter the serious implications of habitat fragmentation. Many biologists consider fragmentation to be the single greatest threat to biodiversity, particularly in temperate

regions (Dottavio et al. 1990; Fiedler and Jain 1992; Hudson 1991; Temple 1993). Landscape connectivity is vital to link ecological processes and elements at a variety of temporal and spatial scales. Landscape connectivity provides for habitat, dispersal, migration and long term movement of species over generations. These are necessary to sustain gene flow, which is itself necessary for species survival (Hudson 1991; Noss and Cooperrider 1994). Finally, landscape connectivity is vital in providing a buffer against encroachment from surrounding land and resource use (Biodiversity Science Assessment Team 1994; Harding and McCullum 1994). Canadian and American studies have identified over 100 sources of external impacts on protected areas. Many of these impacts result from surrounding land uses and a lack of a buffer space (Biodiversity Science Assessment Team 1994; Martinka 1992). Addressing the need for larger, more numerous and more connected protected spaces, and the need to consider and mitigate external impacts on a protected area requires alternative approaches to public acquisition and management. These alternatives must include land and resource uses on private lands.

As ecosystems are increasingly fragmented and disrupted, there must be sustainable use and stewardship of all our remaining landscapes to ensure that existing protected areas retain their ecological integrity. Stewardship of the landscape is also necessary to provide additional protected space to complement these areas (Dottavio et al. 1990; Fiedler and Jain 1992; Franklin 1993; Harding and McCullum 1994; McNeely et al. 1990; O'Connell and Noss 1992; Slocombe 1993; United Nations 1992). Social, economic and cultural factors associated with human use of the landscape must therefore be integrated into management planning (Hobbs et al. 1993). This integration requires the cooperation of landowners and resource users on these lands. It also requires the cooperation of all the relevant government and non-government organizations (Caza 1993; Fiedler and Jain 1992; Harding and McCullum 1994; Nelson 1991/93; Richter 1993; Wells 1993).

Increased scientific understanding has also revealed that natural systems constantly change. Conservation goals, therefore, cannot be achieved in perpetuity only by special isolated areas set aside for long term protection (Harding and McCullum 1994). There must be a dynamic approach that can compensate for changes to natural systems and that encompasses large parts of the landscape (Board on Environmental Studies and Toxicology

and Commission of Life Sciences 1993). Again, cooperation from private landowners is essential to achieve this flexibility.

2.1.3 The Importance and Benefits of Private Land Conservation

Private land conservation efforts provide an essential complement to the existing protected areas network both by adding additional protected space and by ensuring that existing areas remain ecologically viable. Private land conservation efforts can also help to identify unique and endangered species and habitats in need of protection (Canadian Environmental Advisory Council 1991).

The process of fostering private land conservation can play important educational roles. First, it can foster a conservation ethic in those individuals directly affecting land and resources. It increases people's awareness of the full social and ecological costs of environmental and land use choices, and educates landowners on alternative land uses. It can lead to long term changes in land use (Canadian Environmental Advisory Council 1991; Cutting and Cocklin 1992; Filyk 1992; Perrings et al. 1992). These changes benefit society at large by ensuring sustainability of the environment. They benefit private landowners since they enhance the long term productivity of the lands.

The education involved in private land conservation is critical because currently, even for those landowners concerned about nature conservation, there is little guidance for land use decisions and management (Lynch-Stewart 1991; O'Connell and Noss 1992). The private land conservation process not only provides information, but also provides encouragement for landowners who are already interested in protecting species and habitats (Canadian Environmental Advisory Council 1991; Cutting and Cocklin 1992). Also, since private land conservation identifies sympathetic landowners, it enables targeting of major efforts and resources on the remaining landowners (Moull 1989; Hilts and Reid 1993).

Private land conservation can also encourage support for and interest in other conservation and environmental issues. It can do this by changing attitudes that have caused resistance to conservation in the past (Canadian Environmental Advisory Council 1991; Cox 1989; Cutting and Cocklin 1992; Hilts et al. 1991; Wildlife Advisory Council 1993). It can instill in people a sense of pride, ownership and appreciation for their local surroundings, and a sense of ownership that is not possible with publicly protected areas (Filyk 1992). Participation in or exposure to private land conservation efforts may even

lead to further community involvement in other environmental and resource management and initiatives.

Private land conservation has an important role in enhancing communication and cooperation with landowners (Cox 1989). It offers an opportunity to work with landowners in a positive way to address the difficult conflict between landowner rights and stewardship responsibility for natural heritage (Filyk 1992). It enables landowners to maintain a sense of ownership and control, while protecting natural heritage.

Private land conservation offers a grass-roots and community-based approach to conservation. Such an approach is more likely to meet the needs of landowners, to be supported by the local community and to engender an atmosphere of trust and cooperation on regulatory matters (Hobbs et al. 1993). Partnerships that bring together expertise, staff and equipment and other resources, can create unique perspectives, and can create high levels of synergy and motivation (Filyk 1992).

2.2 Private Land Conservation in the Nova Scotian Context

2.2.1 Landscape Characteristics

Although Nova Scotia is a relatively small province, it supports a diversity of natural areas and features. Its proximity to the North Atlantic Ocean and its complex geological history have resulted in a diversity of natural landscapes, with varied geological, geomorphological and biological characteristics. It includes nine major climatic regions, 47 geological formations, and 84 major soil types (Lynds and Leduc 1993). The landscapes include Acadian forest, tundra-like heath barrens, freshwater wetlands and river estuaries with extensive areas of tidal salt marsh, coastal plains and rocky coastlines (Burnett et al. 1989). Forested areas, a mix of both softwoods and hardwoods, cover about 80% of the landscape (Forestry Canada and the Nova Scotia Department of Natural Resources 1994). The diversity of landscapes and forests has created a wide range of habitats for a variety of plant and animal species, including species assemblages described as: Northern Boreal, Southern Canadian, Alleghenian, Coastal Plain and Arctic-Alpine. In all, there are 6000 species of plants and vertebrate animals, and at least 20,000 species of invertebrate animals in the Province (Lynds and Leduc 1993).

2.2.2 Impacts on the Landscape

Human history in Nova Scotia has brought significant change to the natural landscape. Pre-European cultures occupied the land for thousands of years. These early hunting and gathering societies depended upon the natural resources for livelihood, yet can be assumed to have had relatively small impacts on the landscape (Dodds 1993). The last 300 years, however, brought high levels of disturbance and change through intensive settlement and resource exploitation by people with a European culture. Increased hunting for the fur trade, land clearances for farming, forestry and urban development, and a rise in the fishery significantly affected the natural environment. Coastal regions, fertile valleys and rolling uplands in particular, experienced high levels of agricultural conversion and use for forestry (Lynds and Leduc 1993). The twentieth century brought further resource exploitation and landscape changes, through increased urban development, and the creation

of transportation and utility corridors (Burnett et al. 1989). The gradual transformation of natural areas into working landscapes continues today (Public Review Committee 1995). Particularly strong impacts result from increasing resource exploitation and changing settlement patterns (MacIntosh 1993).

The consequences of human history and current practices on the landscape are evident. Predominant land use practices have virtually eliminated all old growth forest in the Province. Today, less than one percent of the trees are over 100 years old (Lynds and Leduc 1993). Virtually all of the Acadian Forest, which once dominated the landscape, has disappeared (Rosen and Woodley 1992). The impacts of human activities are also evident in the loss of 65% of the Province's coastal salt marshes since European settlement, and many of the freshwater wetlands (World Wildlife Fund Canada 1992). In 1974 the International Biological Program identified 76 Nova Scotian sites as being ecologically significant and in need of protection. Eleven of these sites have been substantially altered or completely lost over the past 20 years (Keith 1993). The loss of unidentified natural areas of special significance is likely much higher. There are five regions in the Province where there are no longer any substantial contiguous tracts of natural areas: the Avalon Uplands, Carboniferous Lowlands, Triassic Lowlands, Fundy Coast, and the Atlantic Coast (World Wildlife Fund Canada 1991).

All areas of the Province face at least a moderate risk to biodiversity. Some landscapes, such as the coastal salt marshes, sand dunes and old-growth forests, are highly threatened (Biodiversity Science Assessment Team 1994; Environment Canada 1993; National Roundtable on the Environment and the Economy 1994). Of the thousands of species of plants and animals in Nova Scotia, many are living at the northern or southern limit of their range. Such species are often particularly sensitive to changes in their natural habitat (Wildlife Habitat Issue Group 1994). As a result, some species are at risk due to the pressures of human impact (see Table 1). Some species have become extinct from the region, including the sea mink, passenger pigeon, great auk and Labrador duck. Some species have been extirpated (no longer found in part of their former range) including the gray whale and the Atlantic walrus. There are also several small "remnant" populations that are geographically isolated from the major population. Nova Scotian examples include

the Blandings turtle, lynx, Ribbon snake, Yellow Lamp mussel, the Gaspé shrew and several Coastal Plain and Arctic-Alpine remnant plants species (Duke, undated).

Despite the intensity of human use of the land and resources, almost 40% of the Province remains in a relatively natural state, influenced predominantly by natural processes (Lynds and Leduc 1995a). Although many of these patches are small and scattered, and although some development and change is inevitable, it is not too late to avoid losses of the more important habitats and elements of natural heritage. It is possible to preserve and protect representative examples of the remaining natural areas and ecosystems (Nova Scotia Department of Natural Resources 1994).

Table 1: Species at Risk in Nova Scotia

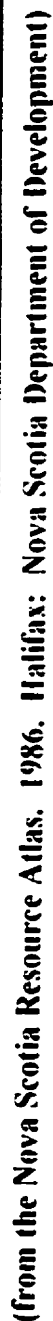
<i>Group</i>	<i>Endangered Species</i>	<i>Threatened Species</i>	<i>Vulnerable Species</i>
Mammals	Bowhead whale Right whale Eastern cougar	Harbour porpoise	Blue whale Fin whale Humpback whale
Other Animals	Harlequin duck Peregrine falcon Loggerhead shrike Piping plover Roseate tern Acadian whitefish Leatherback turtle	Roseate tern Blandings Turtle	Eastern bluebird Ipswich sparrow Least bittern Red-shouldered hawk Cooper's hawk Long-tailed shrew Gaspé shrew Southern flying squirrel Blandings turtle Shortnose sturgeon
Plants	Eastern mountain avens Pink coreopsis Thread-leafed sundew Water pennywort	Golden crest Plymouth gentian Sweet pepperbush	Lilaeopsis New Jersey rush

(from Burnett et al. 1989; Nova Scotia Department of Natural Resources 1994)

2.2.3 Land Ownership

The challenge to conservation efforts posed by the amount of land in private ownership is particularly strong in Nova Scotia. Almost three quarters of the Province is privately owned (see Figure 1) and subject to many competing demands.

(from the Nova Scotia Resource Atlas, 1986, Halifax: Nova Scotia Department of Development)



A large proportion is owned or under license by pulp companies (723,000 hectares), or is in farm holdings (412,000 hectares), or under cooperative forest management with the Department of Natural Resources (460,000 hectares) (Wildlife Advisory Council 1993). Twenty-one percent of all private forest land is owned by corporate interests, predominantly large pulp and paper companies (MacDonald 1990). As in other parts of Canada, many of the most ecologically significant areas are privately owned.

Many of the old growth forests, alpine plants, wetlands with rare plants, unique shorelines and places of historical and spiritual significance are found on private lands (Leefe 1992). Private lands also represent some of the most highly threatened areas in the Province (Biodiversity Science Assessment Team 1994; Harding and McCullum 1994). Many private lands are being logged and with about 50% of the forested area being softwood, and the demand for softwood increasing, the threat to many areas is high. Even those areas that are managed for "conservation" are actually managed for resource exploitation focused on a single species, particularly game species. Other rural lands are being sold for development. Since the mid 1960s, there has been rapid acquisition of recreational land by non-residents, particularly wealthy urbanites from throughout North America and Europe (Land Resource Group 1990). Family farms and back woodlots have become a source of speculative value to rural land owners, with potential implications for the conservation values of these lands (Land Resource Group 1990). Another significant trend in land ownership is the accumulation of land and logging rights by large forestry corporations. Small woodlot owners as well as the natural environment, have suffered as a result (Land Resource Group 1990).

Only 26% of the Province is in crown ownership and over one half of that land is leased or licensed to major forest companies (Lynds and Leduc 1995a; Leduc and Smith 1992). The crown lands not leased or licensed to major forest companies are largely lands of lower productivity (Lynds and Leduc 1995a). The crown land is also not evenly distributed geographically, so the protected areas only on crown land will not provide representation of all the natural habitats, ecosystems and landscapes in the Province. A significant proportion of crown land, approximately 19%, has recently been committed to conservation through the Parks and Protected Areas System Plan. The remaining areas

have been committed to resource extraction and other productive, economic activities (Downe, personal communication; Public Review Committee 1995).

2.2.4 Conservation Efforts

Conservation efforts in Nova Scotia have evolved in response to the human-induced changes to the ecosystem. The aboriginal inhabitants had a close and dependent relationship with the natural world. Some rural European settlers developed a sense of stewardship of the land, and passed both the land and their land ethic on through generations. By the 1800's, however, the prevalence of stewardship decreased and impacts on the natural landscape and resources soon became apparent. Consequently, the government became involved in wildlife management and, later, nature conservation (Dodds 1993). Initial efforts focused on forestry and the management of game species, which set the course for conservation priorities in the Province. Institutional responses focused on public acquisition of land and land-use planning, and became increasingly removed from the landowner. Eventually, as forestry and agriculture intensified, wildlife management became integrated into forestry practices and resource management (Dodds 1993). Conservation was primarily the responsibility of the Department of Lands and Forests (which later became the Department of Natural Resources). The Department consisted of forestry and wildlife divisions and in 1960 a parks division was added to the department (Dodds 1993). The Department's preservation and protection mandate remains a relatively small part of overall conservation efforts in the Province. The 1980s brought new policies and legislation with a stronger conservation mandate for the Department, which includes integrated resource management and private land stewardship.

Nature conservation is now a joint effort shared by the Federal and Provincial government, and by private groups and agencies. The main Federal government departments concerned with conservation are Heritage Canada (formerly Parks Canada) and the Canadian Wildlife Service (Environment Canada). Heritage Canada is responsible for national parks, and the Canadian Wildlife Service is responsible for migratory bird and wildlife sanctuaries. The mandates of these departments focus on protecting nationally significant areas and features.

The Wildlife Division is involved in the conservation of wildlife habitat, integrated resource management initiatives, and corporate stewardship programs for wetlands. The Parks Division is responsible for the parks and protected areas systems plan. The plan involved an assessment of all crown lands to determine priorities for protection. A systems approach was used, based on a landscape classification system and a "gap analysis" process. The plan aims to protect representative natural areas selected from all natural landscapes. Thirty candidate areas were proposed based on the following criteria: size (over 2000 hectares), level of disturbance (predominantly roadless with minimal cultural impacts), ownership (primarily on crown land), representativeness (representative of a particular landscape), natural features (containing outstanding natural features), and recreational potential (offering wilderness travel opportunities) (Nova Scotia Department of Natural Resources 1994). The candidate sites were proposed and public feedback was obtained through a public consultation process. Thirty-one sites were selected and approved by the Minister of Natural Resources in 1996. The proposed system of 31 sites includes representation from 26 of the 77 "natural landscapes." It increases the total proportion of protected area to eight percent of the Province (287,000 hectares and 19% of provincial crown land). Within 13 of the candidate areas, 39,000 hectares of old forest (over 100 years old) have been identified (Lynds and Leduc 1995b).

The Parks Division also coordinates the Special Places Program. They select and manage areas designated as Special Places based on specific criteria (see Table 3). They also maintain files on significant sites, on both crown and private land. These sites have rare or endangered species or represent one of the Province's natural ecosystems or landscapes. The Parks Division is also responsible for provincial parks and significant ecological sites occurring within parks. These areas also preserve unique, rare or representative natural features, although some are established for recreation and tourism purposes.

Non-government groups and private citizens are also involved in conservation in Nova Scotia. The Nova Scotia Wildlife Federation, Ducks Unlimited, Wildlife Habitat Canada, the Trappers Association of Nova Scotia, the Bowhunters Association and the Nova Scotia Salmon Federation have specific interests in wildlife/game conservation.

Other groups include the Nova Scotia Bird Society, the Blomidon Field Naturalists, the Halifax Field Naturalists, the Nature Conservancy of Canada, the Clean Nova Scotia Foundation, the Canadian Nature Federation, the Ecology Action Center Wilderness Committee, the Nova Scotia Federation of Naturalists, the Nova Scotia Nature Trust and several local naturalist and environmental groups.

Organized private land conservation and stewardship efforts in Nova Scotia are relatively recent. Examination of the history of these efforts reveals a strong emphasis on wetland stewardship, to the exclusion of other types of conservation. The primary government agency involved in stewardship has been the Wildlife Division of the Department of Natural Resources. It has built solid partnerships with Ducks Unlimited, Wildlife Habitat Canada, the North American Waterfowl Management Plan and Eastern Habitat Joint Ventures. In 1990 the wildlife division developed a Wetland Stewardship Plan for Nova Scotia (MacDonald 1990). In 1992, the Province passed the Conservation Easements Act. During the years between 1991 and 1994 the Province signed corporate stewardship agreements with Bowater Mersey, Stora Forest Industries, and Scott Maritimes (Milton 1995a). Several stewardship workshops have also been held in the region. The first conservation easement was signed in 1994, and in 1995 the wildlife division prepared a draft Stewardship Strategy for Nova Scotia (Milton 1995). The recently established Parks and Protected Areas Systems Plan recognizes the importance of private stewardship in completing the protected areas plan, although no commitments or plans have been made to address these needs. The Department of Natural Resources has created a few publications for landowners to provide information on the management of private lands for wildlife. Several of the non-government groups mentioned above have become involved in private land conservation including Ducks Unlimited, the Nature Conservancy of Canada, the Nova Scotia Nature Trust, local land trusts and other community groups including the Tuskent River Environmental Protection Association, the Margaree Environmental Association, the Kingsburg Coastal Conservancy and the Bras d'Or Preservation Foundation. Private individuals have been involved in protecting natural areas through partnerships with conservation organizations and agencies, sale or donation of land. Some landowners also buy land specifically to protect significant features or

practice conservation on their own lands independently, while several corporations have been trading or donating lands of conservation value with conservation groups.

2.2.4.1 Legislation, Policies and Plans

Nova Scotia has several important pieces of conservation-related legislation and initiatives that have the potential to benefit private land conservation (see Table 2 and Table 3). The most effective, or widely used of these are the Special Places Act (1989), the Conservation Easements Act (1992), and the Parks and Protected Areas System Plan (1995).

Table 2: Provincial Initiatives Relevant to Private Land Conservation

<i>Initiative</i>	<i>Major Features For Conservation</i>
Nova Scotia Stewardship Strategy (in progress)	<ul style="list-style-type: none"> • Outlines the Wildlife Division's plan for encouraging private land stewardship • Focuses on sustainable use, not nature preservation • Proposes use of a diversity of tools ranging from education to legal agreements • Proposes that the Wildlife Division be the coordinator of a multi-party approach to stewardship, involving government agencies and non-governmental groups
Old Forest Strategy (in progress)	<ul style="list-style-type: none"> • Places priority on inventory, evaluation, and protection of old forests • Includes educational goals, and sustainable forest management on private and crown lands
The Parks and Protected Areas Plan/Strategy (in progress)	<ul style="list-style-type: none"> • A systematic plan to protect representative areas for each of the Province's natural landscapes, and unique, rare, or otherwise outstanding features, or areas which provide wilderness recreation opportunities • Adds 31 new sites to the existing protected areas system
Sustainable Development Strategy (1992)	<ul style="list-style-type: none"> • Recommends completion of the provincial protected areas system and ensuring adequate representation of each of the Province's natural regions • Recognizes the importance of private stewardship and the protection of areas outside of protected areas

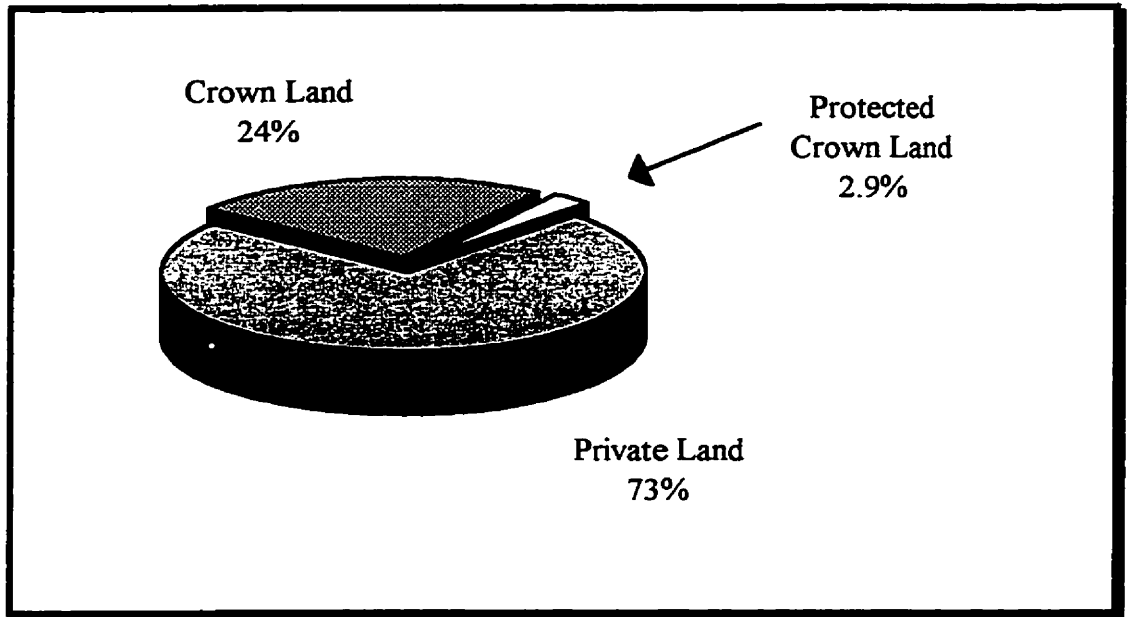
Table 3: Legislation Relevant to Private Land Conservation

<i>Legislation</i>	<i>Major Features For Conservation</i>
Beaches Act (S.N.S. 1975, c.6)	<ul style="list-style-type: none"> • Provides protection for beaches and associated dune systems
The Conservation Easements Act (S.N.S., 1992, c. 2)	<ul style="list-style-type: none"> • Enables the establishment of special easements for the purposes of conservation. Agreements can be made between landowners and either government organizations or specific conservation agencies • Organizations designated to hold easements include the Nova Scotia Nature Trust, the Nature Conservancy of Canada, the Bras d' Or Preservation Foundation and the Federation of Nova Scotia Naturalists
Crown Lands Act (R.S.N.S. 1989, c. 114)	<ul style="list-style-type: none"> • Relates primarily to forest management issues on crown land, with provisions for integrating wildlife and recreation values with harvesting • Authorizes the Minister to acquire by purchase, gift, lease, or license any land or interest in land
Environment Act (S.N.S. 1994, c.1)	<ul style="list-style-type: none"> • Provides for the preservation and protection of environment including the air, land and water, although it does not directly contribute to conservation
Forests Act (R.S. 1989, c.179)	<ul style="list-style-type: none"> • Recognizes the importance of maintaining or enhancing wildlife and wildlife habitat, although directed primarily toward increasing forest product yield • Aims to maintain long term diversity and stability of forest ecosystems and to encourage cooperation with landowners to ensure productive use of forests
Forest Enhancement Act (1986)	<ul style="list-style-type: none"> • Provides a possibility for greater consideration of wildlife in forestry practices • Encourages management of private woodlots, and wildlife enhancement
New Forest Policy (1986)	<ul style="list-style-type: none"> • Includes a commitment to integrating wildlife considerations with forest management (including the Forest/Wildlife Guidelines)
Planning Act (RS, c.346, s.1)	<ul style="list-style-type: none"> • Has the potential to work for conservation through zoning, bylaws, control of development, municipal planning strategies and other strategies for influencing land use in the Province
Provincial Parks Act (S.N.S., 1988, c. 18)	<ul style="list-style-type: none"> • Allows the designation of provincial protected areas
Provincial Parks Policy (1988)	<ul style="list-style-type: none"> • Revised in 1988 to ensure a stronger protection-oriented mandate • Overriding theme is preserving the integrity of the natural environment • One of its key strategies is cooperation with private landowners
Special Places Protection Act (R.S.N.S., 1989, c.438)	<ul style="list-style-type: none"> • Allows areas to be designated as ecological sites registered at the Registry of Deeds and subsequently remaining with the deed permanently • Criteria used for designation: suitable for scientific research and education; representative example of provincial ecosystems, contain rare or endangered native plants or animals, provide for long-term study of undisturbed systems
Trails Act (S.N.S., 1988, c. 20)	<ul style="list-style-type: none"> • Provides options for protecting trails and special management zones adjacent to trails on private land.
Wildlife Act (S.N.S 1989, c.504, s.19)	<ul style="list-style-type: none"> • Provides a mandate for protecting wildlife • Allows the Minister to purchase, lease or otherwise acquire land for wildlife habitat protection, management or conservation. Allows designation of wildlife sanctuaries and management areas on crown or private land
Wildlife Policy (R.N.S. 1987) Wildlife Strategy (1993)	<ul style="list-style-type: none"> • Aims to maintain and manage wildlife populations and diversity for the use and enjoyment of Nova Scotians, through integrated land uses, special management efforts, education and private stewardship

2.2.4.2 Protected Areas

At the present time, excluding the proposed Parks and Protected Areas Strategy candidate sites, approximately 2.9% of the Province is highly protected by legislation (Lynds and Leduc 1995a). Figure 2 shows the ownership of land in the Province and relative amounts of protected land. This excludes any lands where logging, mining, hydroelectric development, or other industrial activities are undertaken.

Figure 2: Proportions of Land Tenure and Protected Areas in Nova Scotia



Nova Scotia's national parks contain the majority of this protected area, or 2.4% of the provincial land base. These parks include Kejimikujik, Kejimikujik Seaside Adjunct, and Cape Breton Highlands National Parks, and the Fortress of Louisbourg National Historic Park (see Figure 3). Heritage Canada maintains these sites. The Province has seven National Wildlife Areas and eight Federal Migratory Bird Sanctuaries, administered and owned by the Canadian Wildlife Service. The Province has one Ramsar site (wetlands of international significance), which is also a Hemispheric Shorebird Reserve.

Provincially protected areas account for only 0.25% of the Province. The Parks Division is responsible for seven sites protected under the Special Places Protection Act (MacKinnon, personal communication). The Department of Natural Resources is responsible for 14 Provincial Wildlife Management Areas, 14 Wildlife Sanctuaries (full

protection), 7 constituted parks, and 17 park reserves. They are also responsible for numerous beach parks, camping parks and historic sites where wildlife is protected from hunting and trapping (Wildlife Advisory Council 1993). The latter three types of sites were developed for their recreational potential and do not contribute substantially to protected areas. The multi-party Eastern Habitat Joint Venture program protects three wetland sites (Burnett and Hundert 1994). The Department of Natural Resources also maintains one private property that is protected through a conservation easement.

Protected natural areas owned or managed by private organizations include several bird sanctuaries acquired by the Nova Scotia Bird Society with a total of 178 hectares. The Nature Conservancy of Canada protects land through acquisition and easements on private lands. It is currently involved in nine projects protecting more than 1,478 hectares of land. Private land trusts and conservation organizations are also active in protecting several natural areas on private lands in the Province, through land donated or sold by private landowners, or protected through conservation easements. Many areas of private land are unofficially protected by individual citizens but there is no registry of these areas and little assurance that the protection will continue once ownership is transferred. Over 200 waterfowl habitats, occupying 9,300 hectares, are managed by Ducks Unlimited. Since these sites typically involve intensive management and manipulation of wetlands, they are not considered to be natural areas (Keith 1993).

There are many other sites that have been identified as ecologically significant and are not yet protected. Among these are 76 potential ecological reserves identified through the International Biological Program in the 1970s and 31 protected areas on crown lands proposed by the systems plan. There are also continuing efforts to identify other significant sites in the Province (MacDonald 1990).

2.2.5 Recognition of the Role of Private Land Conservation

There is increasing commitment to the protection and conservation of diverse wildlife and natural areas, and recognition of the need for an ecosystem-based approach and integrated planning. This commitment is evident in provincial initiatives, numerous workshops and conferences, and the efforts of non-government organizations and private individuals. It appears that public support for nature conservation may also be strong. In the Atlantic region the degree of participation in nature-oriented activities is even greater than other regions, and growing faster than population growth (Canadian Wildlife Service et al. 1993). Recent studies have also shown that Nova Scotians have a higher level of concern for the protection of wildlife than other Canadians (MacDonald 1990; Wildlife Advisory Council 1993). Much of the concern, however, is for more recreation, resource-based conservation and wise use of resources than for natural heritage preservation. Public concern for protected areas was evident in the results of the public consultation process for the Parks and Protected Areas Systems Plan. Responses indicated an awareness of the issues of the loss of natural areas, the gradual transformation of natural areas into a working landscape, an attachment to wilderness areas and a strong sense of respect for land (Public Review Committee 1995; Smith 1996).

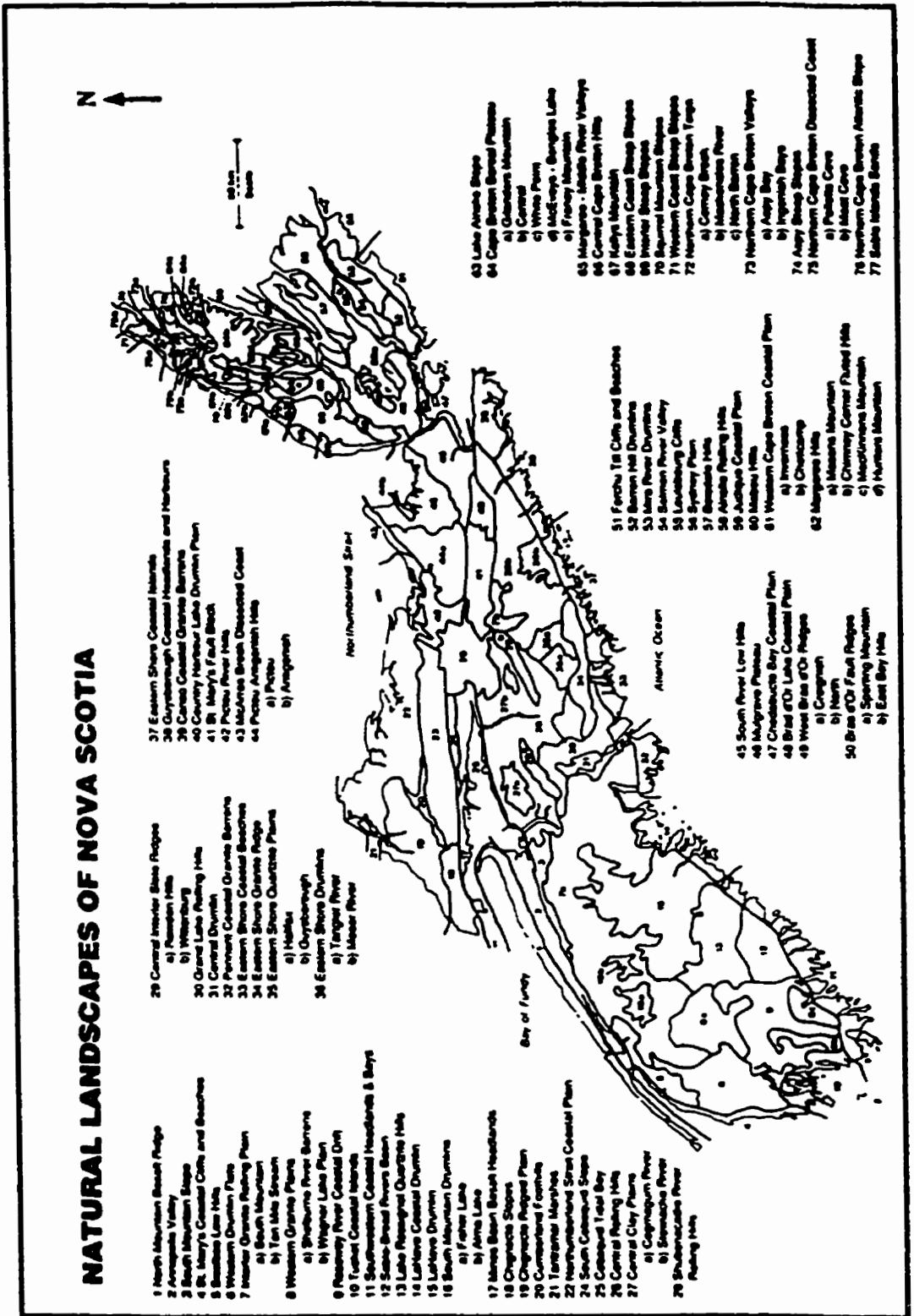
In addition to the growing concern for nature conservation in general, support for private land conservation specifically is also increasing. It is important in meeting the goals of local applications of federal initiatives including the Endangered Spaces Campaign (World Wildlife Fund Canada), the National Biodiversity Strategy and the Protected Areas Vision. The Endangered Spaces Campaign 1995-96 progress report, for example, stated that the Province must work with the private sector and other agencies on a comprehensive strategy to advance conservation on private lands. Private land conservation is also recognized as being important in meeting the conservation mandate of provincial initiatives. These initiatives include the Provincial Parks Policy, the Wildlife Strategy, the Sustainable Development Strategy for Nova Scotia the Special Places Program, the Provincial Stewardship Strategy Parks and Protected Areas Systems Plan (Ogilvie 1992). The Systems Plan highlights the need for the Department of Natural Resources to work cooperatively with private sector interests in order to achieve representation of the

landscapes not present in the existing systems plan. Such cooperation is also required to increase the overall amount of natural area protected. The plan will therefore place a high priority on developing and implementing a range of alternative mechanisms to encourage the protection of significant natural areas on private land. One of the recommendations of the Public Review Committee, who conducted the public consultation process for the Systems Plan, was to address barriers to voluntary protection or conservation of lands by private landowners (Public review Committee 1995). Another of their recommendations was to encourage complementary management on adjacent lands where possible, through voluntary private stewardship (Public Review Committee 1995; Smith 1996).

2.2.6 The Importance of Private Land Conservation in Nova Scotia

Private land conservation is an important component in meeting protected areas goals in Nova Scotia. Although it is an important achievement, the proposed Systems Plan will only protect 26 out of the Province's 77 "natural landscapes" (see Figure 4). There is also a lack of redundancy in its representation of landscapes, which makes the protected areas system more vulnerable to future loss of landscapes (Leduc and Smith 1992). Over 40% of the Province's land area will not be satisfactorily represented by protected areas (Nova Scotia Department of Natural Resources 1994). The proposed systems plan would also protect only eight percent of the Province rather than the aim of 12%. There are clearly significant "gaps" in representation of natural features, landscapes and ecosystems within the Province. These gaps cannot be filled by a plan based solely on protected areas on crown land (Leduc and Smith 1992).

Figure 4: Nova Scotia's Natural Landscapes



Effective systems level planning requires integration of large scale goals with smaller scale goals, in a system that is linked across hierarchical levels. The Provincial Protected Areas Systems Plan eliminated many sites of potential value with the criteria used to determine candidate sites. Specifically, the plan eliminated all private lands from consideration. It also eliminated all natural areas under 2000 hectares, and areas without wilderness recreation potential. There must be an accompanying approach to deal with the gaps in the systems plan approach and integration with more localized systems planning. Because of land tenureship in Nova Scotia, such efforts will require the integration of private lands into the protected areas network.

Many of the existing protected areas, as well as sites proposed in the Systems Plan, are relatively small and isolated. Their ecological viability is questionable, particularly in light of the development and resource-extraction taking place on the surrounding lands. Existing sites have been managed according to traditional approaches that have not been based on ecosystem-level concerns and the principles of conservation biology. Recent efforts to move towards an ecosystem-based approach to park management indicate that private lands will play an increasingly important role in the long-term viability and effective management of existing protected areas.

Government agencies have traditionally created protected areas in the Province, using public acquisition approaches. Alternative institutional arrangements and approaches are now required, in light of the land ownership patterns, and economic, technical and political challenges facing conservation efforts.

2.3 Private Land Conservation: A Background

Private land conservation has become a popular means of protecting natural heritage throughout North America (Brusnyk et al. 1990). Experiences with private land conservation have been positive and encouraging. Many innovative strategies have been developed by private landowners and managers themselves and by numerous government and non-governmental organizations worldwide (President's Commission on Environmental Quality 1993). Studies indicate that the participating landowners are committed to stewardship, and show their support through their actions on their land and the value they place on wildlife and habitats (Brusnyk et al. 1990).

A broad range of strategies and tools for achieving private land conservation are currently in use, in response to the diversity of both landowners and the lands and resources in need of protection (Hoose 1981). There are several strategies for protecting natural areas and biodiversity on private lands that operate independently of private landowners themselves. These strategies include public acquisition and management of lands, legislation, economic controls and policies which influence land use. Other strategies involve the specific tools of land-use planning, including: zoning, municipal strategies, development agreements, and land-use bylaws (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Evans 1992; Hilts and McLellan 1984; Hilts 1989; Madsen and Petterson 1987; Norton 1986; Strong 1983; Van Patter and Hilts 1990). Many of these strategies may be quite appropriate for Nova Scotia. However they are beyond the scope of my research, which focuses on strategies based on voluntary stewardship of land.

2.3.1 Tools for Voluntary Conservation on Private Land

There are several tools that can be used to encourage voluntary private land conservation and which are commonly promoted in existing private land conservation programs. They vary in their efficiency, cost, the strength and duration of protection they offer, and the degree to which they restrict a deed (Hoose 1981). Consequently, most private land conservation programs try to provide a range of tools for landowners, or determine specific local needs and target their efforts accordingly. There are three main

types of private land conservation tools including: education, agreements, and transfers of property or certain property rights to a conservation organization or agency.

2.3.1.1 Information/Education-based Tools

Education

The least restricting and least demanding strategy available for conservation on private lands is education. It is an essential element in successful private land conservation, and is an important component of all conservation tools. It is usually considered as one step in the process of gaining a higher level of conservation commitment.

Education efforts may be general or more focused. General education efforts may use brochures and other advertising that provides information on general conservation values, conservation tools and strategies, supporting organizations, and incentives to landowners. There are also more focused educational efforts, centered upon a landowner contact program. Such a program identifies key sites, notifies targeted landowners of the significance of their property, and then provides information, support and advice. It often involves regular communication with landowners about achievements and developments within a particular private land conservation effort or program. Landowner contact programs usually also provide some means of recognizing the voluntary participation of owners through gifts or awards or public acknowledgment in the media or on publicly displayed plaques (Caza 1993). The landowner contact program is usually the means through which landowners explore other tools, such as agreements (Filyk 1992; Hilts and Reid 1993). Some advantages and disadvantages of education-based approaches are outlined in Table 4.

Table 4: Education-based Tools for Private Land Conservation

<i>Tool</i>	<i>Advantages</i>	<i>Disadvantages</i>
All educational approaches	<ul style="list-style-type: none"> • relies on voluntary support thereby retaining freedom of choice, independence and flexibility • has potential to provide long term changes in attitudes and behaviour 	<ul style="list-style-type: none"> • soft-sell approach does not provide any guarantee of protection
a) Landowner Contact specifically	<ul style="list-style-type: none"> • allows effective targeting of efforts • caters to specific landowner needs and interests • provides a framework for enacting other protective techniques • knowing the position of the landowner allows prioritization of scarce resources 	<ul style="list-style-type: none"> • can be very costly and time consuming

2.3.1.2 Agreements

Stewardship Agreements

The most inexpensive and least committing agreement option is the informal verbal agreement between a landowner and a conservation organization or agency. Verbal agreements have been used to protect over 4,400 hectares of natural area in Ontario, through 350 agreements with Ontario's Natural Heritage Stewardship Program. There are also more formal written agreements with no active management requirements, but with a higher commitment expectation than a verbal one (Hilts 1991a). Both types of agreements usually include a commitment to be an appropriate steward of the land. They also include a commitment to notify the conservation organization or agency involved of any upcoming change in land-use or ownership (MacDonald 1990). This notification provides the organization with an opportunity to prevent any potential threat to the area (Hoose 1981). Management agreements necessitate more commitment and involvement than the first two types because they include a commitment to a specific land management plan (Van Patter and Hilts 1990). Expertise and advice are provided to involved landowners, and sometimes labour and capital costs, to enable them to actively protect and manage their land for conservation purposes (Filyk 1992). The Nova Scotia Department of Natural Resources

has used management agreements successfully for woodlot management. The level of the agreement, whether verbal, written or a management plan, determines the level of protection it provides.

Agreements can provide a starting point for building a long-term relationship with a landowner and for initiating further landowner involvement in conservation efforts (Hilts and Reid 1993). They are appealing to landowners because in all types of agreements landowners retain property ownership. This can be either an advantage or disadvantage to the landowner, depending on the costs and commitment involved and landowners' interest in management. Similarly, conservation organizations benefit by not having the costs and responsibilities of managing the land, but at the same time, having less control over use and management of the land (Hilts and Reid 1993).

Legal Agreements: Conservation Easements and Covenants

Over 500 non-profit organizations and government entities around the world have used legal agreements successfully for conservation purposes. The violation rate of legal conservation agreements is low (about 2%), and violations usually occur by accident or as a result of poorly defined terms. Despite this success, however, legal agreements are relatively new in Canada (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; MacDonald 1990).

Legal agreements include covenants, easements and deed restrictions. Conservation easements are agreements between landowners and qualified organizations, registered against title to the land (Cog 1993). Easements are non-“possessory” interests in the use and enjoyment of the property of another. They involve the sale or donation, in perpetuity, of certain rights to all or part of a property, to an agency or organization that holds such rights in the public trust. Conservation easements may restrict certain activities and uses of the land that could damage or destroy its ecological, scenic or resource values. Examples of restricted activities include industrial or subdivision development, clear-cutting, landscape alteration, mineral development and garbage dumping (Hoose 1981). Alternatively, conservation easements may confer positive rights on the receiving organization regarding the preservation and management of the land (Cog 1993; Powers

1995; Sandborn 1990). The agreement includes allowance and access for the cooperating organization to monitor and enforce the agreement. If the agreement is violated the organization can take legal action to fulfill the easement obligations (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Cog 1993; Power 1995). With a conservation easement, the landowner may still sell, bequeath or otherwise transfer the land at any time. The easement reduces the value of the land because it permanently prohibits development (Strong 1993). The cost, if purchased, is the difference between value of land before acquisition and its value for uses permitted under the easement (Strong 1983).

A covenant is an agreement or promise made under seal, created either through common law or statutory process. It can create positive and/or negative obligations on a landowner, but does not involve transfer of land or interests in land (Trombetti and Cox 1990). Covenants can be renewed or granted in perpetuity and recorded on the deed, thereby providing permanent protection by binding all present and future owners of the land. The covenanting organization (individual, conservation organization or government agency) may enforce the covenant, impose a fine for breach of covenant and may even sue the landowner if necessary (Edwards and Sharp 1990).

The process of securing an easement or covenant can be time-consuming and possibly expensive. It may require several services including access to literature and/or advice from a charitable conservation group or government agency, legal and tax advice on easement law and related tax and legal planning, and other professional services including appraisal, land planning and consulting (Small 1992). Steps involved in registering an easement include the following: a title search, legal description and plan, designation of the land as a "natural area," registration of the "natural area" in the registry of deeds, detailed baseline documentation, drafting an easement agreement, cabinet approval of the easement (only required if the Province is the grantee), registration of the easement in the registry of deeds and monitoring and enforcement of the easement or covenant (Power 1995).

A deed restriction can be used when there is no organization to hold a conservation easement. The landowner is responsible for monitoring and enforcing the agreement. There is, therefore, a high risk of non-compliance when the property changes hands. This

disadvantage is somewhat offset by the inclusion of a reverse interest clause that transfers title to a named person if the landowner violates the agreement.

Special Places Designation

Another option available to landowners is designation of the land under the Nova Scotia Special Places Protection Act. Although this option has not been used extensively, it assures long-term protection since the plan is legally binding on subsequent owners of the property. It is limited, however, to sites meeting educational, scientific and ecological criteria (see Table 3). Special Places designation involves a management plan administered by the Province. The provincial government takes responsibility for establishing and maintaining survey boundaries and signage and for enforcing the regulations set out in the management plan. The procedures for designation include the formulation of a management plan, legal description and plan, designation as an ecological site, and registration in the registry of deeds. Violations of the agreement are dealt with through the Special Places Act. Violations under most other types of stewardship agreements are dealt with through civil legal actions, which can be costly and time-consuming.

Other Provincial Designations

As indicated in Table 3, there are other designation options available for private lands under specific circumstances including designation as a wildlife management area, protection of a beach or areas adjacent to a provincial park.

Leases

A lease agreement creates an interest in land, but only for a designated period. The agreement determines the conditions for tenant entry onto the property, management rights and responsibilities, and other conditions including exclusivity of possession and compensation. Private land may be leased for conservation purposes in one of three ways. A landowner may lease his or her land to a conservation organization. The landowner is then provided an income or rent, while active conservation projects are developed on the property (Filyk 1992). A second leasing option involves a lease-back. In this case, the land is sold to a conservation organization which may place restrictions on the land. The

organization then leases the use of the land back to the original owner. Alternatively, a farmer can lease land from a conservation organization for a nominal fee, under the condition that he or she signs a management agreement (Hilts 1991a).

Leases are more commonly used in agricultural regions where they are a common form of land management. They have been quite successful, for example, in the prairie provinces, and in farming areas of Great Britain. Leases can be beneficial in situations where the landowner has little commitment to conservation, but is motivated by economic incentives. They are also beneficial when acquisition is inevitable and the agency wants interim control of the land (Hilts et al. 1991). Leases can be a vehicle for maintaining landowner interest in conservation efforts and can lead to eventual purchase or donation (Hilts and Reid 1993). Lease-backs can accommodate landowners who do not want involvement in the conservation process, but who support conservation goals.

Licenses

A license is a written agreement granting a conservation organization the right to enter onto a property to conduct a specified activity, (e.g. wildlife monitoring and management, protection of wildlife corridors). It does not create an “interest” in land. It allows the landowner to protect specific natural habitats while profiting from certain activities that are covered by the license (MacDonald 1990). The license is not registered on the deed and therefore does not affect future owners of the property. Advantages and disadvantages of different types of agreements are outlined in Table 5.

Table 5: Agreement-based Tools for Private Land Conservation

<i>Tool</i>	<i>Advantages</i>	<i>Disadvantages</i>
Verbal Agreement	<ul style="list-style-type: none"> • Simple • Inexpensive • Flexible and adaptable • Non-threatening • Landowner retains ownership • Readily accepted 	<ul style="list-style-type: none"> • Non-binding on future owners • No enforcement power • Easily terminated
Written Agreement	<ul style="list-style-type: none"> • Inexpensive • Flexible and adaptable • Landowner retains land ownership 	<ul style="list-style-type: none"> • Non-binding on future owners • Little security
Management Agreement	<ul style="list-style-type: none"> • Targets specific ecosystem management objectives • May be legally binding • Offer greater protection than other agreements • Landowner retains land ownership 	<ul style="list-style-type: none"> • May be non-binding on future owners • Limited duration • Demanding of the landowner
License	<ul style="list-style-type: none"> • Landowner retains land ownership • Flexible • Inexpensive 	<ul style="list-style-type: none"> • Limited application to conservation • Easily revoked
Lease	<ul style="list-style-type: none"> • Provides economic incentive • Landowner retains land ownership 	<ul style="list-style-type: none"> • Expensive • Limited duration
Conservation Easements	<ul style="list-style-type: none"> • Flexible • Security of protection • May be legally binding in perpetuity • Landowners retain ownership • Cheaper than fee acquisition • Provide legal power for enforcement • Potential property and income tax benefits • Cheaper for grantee organization because management is provided by landowner • Less controversial because the land remains in production or use • Provides landowner education and commitment 	<ul style="list-style-type: none"> • Complex legal document • Time consuming process • Potential capital gains tax penalty • Lack of experience and expertise in dealing with easements • Land must meet certain requirements to be designated and enforced • Can be expensive • Unfamiliar to landowners • Restricts activities on the land, and future sale of the property • High level of commitment and responsibility involved for the grantee organization or agency • May become difficult to enforce with time and ownership change
Deed Restriction	<ul style="list-style-type: none"> • Can be used where there is no qualified organization to hold an easement 	<ul style="list-style-type: none"> • Landowner must monitor and enforce
Special Places Act	<ul style="list-style-type: none"> • Ensures long term protection • Provides government assistance with protection and management • Violations dealt with through the Special Places Act (quasi-criminal) 	<ul style="list-style-type: none"> • Limited to sites meeting particular criteria (provincially significant) • Not available for use for non-government groups

(Adapted from Keith 1993)

2.3.1.3 Transfer of Title or Selected Property Rights by Gift or Sale

Creative Development

Creative development involves combinations of purchase, re-sale, easements and sometimes subdivision development or lot severance, with the purpose of saving significant lands in the process (Hilts and Reid 1993). Limited development is a compromise strategy allowing a land owner to sell or transfer some of his or her land in order to preserve the remainder (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Elfring 1989). Another creative development option involves transferable development rights. This option allows a landowner to sell or transfer the right to develop a property that has been foreclosed by regulation to another individual who owns land that can be developed. The approach is based on the principle that greater density development at the receiving site is offset by open space at the transferring site (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993).

Land Exchange

Another method of obtaining desired conservation lands is to offer landowners alternative lands in exchange for their land. This can achieve more effective land ownership patterns without requiring the expenditure of large sums of money (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993). The landowner receives a satisfactory piece of land, with no restrictions on its use and management. The disadvantage is that it requires possession of an appropriate piece of land for exchange.

Sale

The option of public acquisition of land is highly desirable in some cases because it allows the conservation organization or agency full ownership and control of the land. However, the option can be costly and landowners may be unwilling to sell. If landowners sell their land at market value, they may have high tax consequences (Cutting and Cocklin 1992). Bargain sale is an alternative to market value purchase. The landowner is eligible for an income tax deduction equal to the difference between the sale price and the full fair

market value. He or she also has lower capital gains to pay (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Hoose 1981).

Another option is the use of a “right of first refusal” agreements, which provides conservation organizations with an advantage in the marketplace. It consists of a contract between a potential buyer and the landowner, promising the conservation organization the first option to buy if the landowner decides to sell. The agreement includes a specified price and time period for payment. This option allows the buyer time to raise funds or make an appropriate counter offer to the landowner (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Hoose 1981). Its only advantage to the landowner is the opportunity to ensure the land is used for conservation purposes, while obtaining full market value.

A final option is conservation real estate. It is an alternative to permanent acquisition. It may involve buying land, placing restrictions on the land, and then selling it to sympathetic owners who will conserve its natural values (Hilts and Reid 1993). Alternatively, only part of the land may be re-sold and the remainder is kept for conservation purposes (Hilts and Reid 1993). This option is only useful in certain circumstances. It is useful where a landowner is not interested or is unable to participate in other protection strategies, or where a landowner is negotiating an easement that will cost near market value. Purchase with sale-back is also useful in situations where the property is already on the market or about to be listed, or part of an estate is going to be disbursed (Hilts et al. 1991). Another real estate-based approach involves a conservation group maintaining a list of clients who are interested in the purchase and conservation of land. The group coordinates these potential buyers with significant properties that come up for sale on the open market (Hilts and Reid 1993).

Donation/Gift

Donations to a conservation organization can be made in cash or kind. They may involve outright donations, or living estates, donations in wills, or trusts (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993). They all offer the landowner the opportunity to control the level of protection provided when

selecting the type of recipient organization and when specifying the conditions of the donation.

An outright donation of land or interest in land (donation of certain property rights) provides the landowner with a gift tax for income tax deduction for the full appraised value. There are lower estate taxes and the landowner pays less capital gains tax if he or she donates the land at the present time, rather than in the future.

A bequest is a donation of land or of an easement, made in a will, to take effect at the time of one's death. It allows unrestricted use of the land by the owner until death and ensures its protection thereafter. It does not offer present income tax savings, but the value of the donation is excluded from the estate for tax purposes, with benefit to heirs of the property. Also, the landowner is responsible for all property taxes. A bequest, however, allows the landowner flexibility and the opportunity to change his or her mind about the bequest.

A living estate, or gift of remainder of interest, involves donating land to a charity or government agency, while retaining the right to use the land until death. The landowner may also transfer the land to a conservation organization through sale, instead of donation. The landowners' heirs receive cash in return for title transfer. One of the advantages of a living estate is that the landowner maintains the right to use the land, but is not responsible for property taxes. The landowner is also eligible for a tax benefit through a charitable gift, and the value of the gift is the full appraised value of the donation. Finally, the land does not have to meet the conservation purposes test.

A trust is a property holding device like a corporation. The landowner, however, controls the trust and can alter it or revoke it at any time, name replacement trustees and place property in and take it out at any time. The landowner does not have to pay property taxes. Its main advantage is the flexibility it offers to the landowner. Such flexibility, however, means that any property in the trust is not strongly protected and may be removed from the trust at any time.

Other donation options involve combinations of these various alternatives. One such option is to donate a gift of an easement now, and donate the remainder to the family in a

Table 6: Tools for Private Land Conservation Based on Transfer of Title

<i>Tool</i>	<i>Advantages</i>	<i>Disadvantages</i>
All tools involving title transfer	<ul style="list-style-type: none"> • Most secure option • Freedom of control for management and resource protection • Public recognition • Landowner is relieved of responsibilities and obtains tax benefit or benefits from proceeds of sale 	<ul style="list-style-type: none"> • May be expensive to purchase • May require many resources to manage and monitor • Ownership responsibilities may include financial burden (tax and enforcement costs) • Landowner loses ownership of land • Lost opportunities for landowner commitment and education
a) Creative Development	<ul style="list-style-type: none"> • Provides fair market price for landowner and conservation of land 	
b) Land Exchange	<ul style="list-style-type: none"> • Provides land of equal value for landowner • Requires less financing than acquisition 	
c) Alternative Sale Options (bargain sale, rights of first refusal,	<ul style="list-style-type: none"> • Provides for fair market price for landowner and conservation of land • Potential income tax benefits 	
d) Conservation real estate	<ul style="list-style-type: none"> • Provides for fair market price for landowner and conservation of land 	<ul style="list-style-type: none"> • No landowner commitment • Requires large expense and risk on resale value • May be difficult to find a new buyer
e) Donation/Gift	<ul style="list-style-type: none"> • Provides for fair market price for landowner and conservation of land • Potential income tax benefits • Potential benefits for heirs • Landowner can chose level of protection 	

(Adapted from Keith 1993)

will. This option provides a gift tax credit, lower estate taxes and capital gains. The property taxes would be lower for both the landowner and future heirs. The landowner is

able to give away the land expeditiously while maximizing tax benefits, in that the appraised value is lower. A second similar option is to donate conservation easement now, and the remaining interests in land in a will. Landowners may give the two gifts to different organizations. There are no property taxes, and the landowner can maintain use of the land during his or her lifetime (Small 1992).

2.3.2 *Incentives*

Throughout the literature there is a strong call for incentives to motivate landowners to invest in conservation (Canadian Environmental Advisory Council 1991; Lacey et al. 1988; McNeely et al. 1990; Rubec 1995; World Resources Institute et al. 1992 and see section 2.4.2.9 for a discussion of the economic issues of private land conservation and the various roles of incentives).

Financial incentives may involve a cash payment to encourage participation and to compensate for losses in productivity. Alternatively, financial incentives may involve grants to cover equipment, expenses incurred, or management costs. There are also indirect financial incentives through the provision of special tax breaks or opportunities for cost sharing in land management (Shelton 1981).

Social incentives include both awards and public recognition opportunities. They appeal to the need to be held in esteem by colleagues, self-actualization or pride in managing land well (Shelton 1981; Svoboda 1981). Awards include such things as plaques indicating the contributions the landowner has made, or conservation-oriented gifts such as books or nature magazine subscriptions. Public recognition-oriented awards include providing media coverage or public display of landowner contributions.

Education may also be an important incentive to landowners. Stewardship programs throughout North America have shown that landowners are often most interested in environmental information about their own properties (Hilts 1991b). Landowners are also interested in information about land management for conservation, and information about programs, tools and organizations available for private land conservation. They may also be interested in technical or management advice.

2.3.3 Institutional Arrangements/Options

There are numerous institutional arrangements and options that can be part of private land conservation efforts, and which have been successful within Canada and the United States. The first of these are government-based arrangements. The most significant federal involvement with private land conservation has been through cooperative efforts with private land owners having property adjacent to protected areas or whose resource or land use affects a protected area. Community projects such as the Department of Fisheries and Oceans' "Adopt-a-Stream" program have also been successful. Other federal departments with potential for involvement in private land conservation include Heritage Canada, the Canadian Wildlife Service (Environment Canada) and the Canadian Forest Service. The federal government is unlikely to take on a significant role in private land conservation, however, since land and resource use is generally seen as a provincial responsibility.

Provincial governments are involved in several types of projects and programs that have been successful with private land owners. Many of these efforts focus on sustainable resource use or stewardship, not natural heritage protection. In Ontario, for example, the Ministry of Agriculture has a land stewardship program to encourage benevolent farming practices. The Ministry of Natural Resources has a long term woodlot management project and the Ministry also works cooperatively with landowners with Areas of Natural and Scientific Interest (Hilts 1991a; McCleary et al. 1992). In New Brunswick, the Fish and Wildlife Branch of the Department of Natural Resources is involved in a Private Stewardship Program (Brusnyk et al. 1990). Some provinces have also experienced success in establishing stewardship agreements with corporate owners of private land.

Non-governmental organizations offer another institutional option for private land conservation. These groups include large national organizations, regional or provincial organizations and local community groups such as land trusts or naturalist groups. Private non-profit charitable corporations already manage approximately 7 million hectares of land in Canada (Canadian Environmental Advisory Council 1991). Some of the leading private organizations in private land stewardship include Wildlife Habitat Canada, Ducks Unlimited (Canada) and the North American Waterfowl Management Plan, which focus on specific

species or habitats (Environment Canada 1993; Rakowski and Massey 1993). A few private groups work on the protection of natural heritage in all habitats, such as the Ontario Natural Heritage League.

Local naturalist groups are another institutional option for private land conservation. The Federation of Ontario Naturalists and the Bruce Trail Association, for example, have been notable leaders in the field. They have purchased reserves, encouraged others to do the same, and obtained handshake conservation agreements with numerous private landowners (Hilts 1989).

Nature Conservancies are one of the largest and most successful organizations in land acquisition and private nature reserve management in the world (Canadian Environmental Advisory Council 1991; Hudson 1991; Richter 1993). Nature Conservancies own over 2 million hectares in North America. Within Atlantic Canada, the Nature Conservancy has acquired 13 sites, covering more than 1600 hectares (Burnett and Hundert, 1994).

Land trusts are playing a larger role in private land conservation throughout the world. They are experiencing a high rate of success and are leaders in creating innovative approaches to conservation (Reid 1989). In Britain, for example, the National Trust owns at least 10% of England, and Wales and has over 2 million members (Carbin 1991). Similarly, in the United States the number of private trusts has grown from 50 or 60 in the 1970s to over 900 today (Carbin 1991). Trusts are also significant in Scotland, Australia, New Zealand and Bermuda and other parts of the British Commonwealth (Reid 1989). Although they have been slower to take hold in Canada, successful examples include the Island Nature Trust in Prince Edward Island, which has over 100 privately owned sites under stewardship agreement. The Nature Trust in British Columbia is involved in nearly 200 projects, conserving 12,500 hectares of land and water. There are also successful provincial trusts in Nova Scotia, New Brunswick and Alberta, and local trusts in Quebec (Burnett and Hundert 1994; Harding and McCullum 1994; Hilts 1989; Reid 1989).

An evolving institutional mechanism for private land conservation involves quasi-public institutions and coalitions of government and non-governmental organizations. These options offer an alternative to traditional institutional arrangements (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993). The

Natural Resources Stewardship Program sponsored by the Natural Heritage League in Ontario, for example, is a coalition of 31 government and non-governmental organizations. It has been very successful in obtaining a high level of participation in private land conservation (Hilts 1991a; McCleary et al. 1992; Van Patter et al. 1990). There are also numerous examples of successful regional stewardship programs involving integrated efforts of various agencies and organizations. Examples include the work of the Prairie Pothole Project and Wildlife Federation's Habitat Trust in Saskatchewan (Hilts 1989), the Critical Wildlife Program for Uplands, Tall Grass Prairie Conservation Program, and the Habitat Enhancement Land-Use Program in Manitoba; the Wildlife Protection Program in Alberta, and Quebec's Habitat Retention Program (Cox 1991b; Weatherill 1989).

There are advantages and disadvantages of each of the institutional arrangements (see Table 7). A combination of options should be available to landowners.

Table 7: Advantages and Disadvantages of Various Institutional Arrangements for Private land conservation

<i>Institutional Arrangement</i>	<i>Advantages</i>	<i>Disadvantages</i>
Government	<ul style="list-style-type: none"> • Greater funding potential • Technical expertise and resources • Infrastructure and staff for management, and enforcement • Considered long term • People are familiar with government agencies and their role in resource and land management 	<ul style="list-style-type: none"> • Public distrust of government • Inability to carry out the extensive educational efforts required, and must rely of landowners approaching them • Lack of funding
Non-government (private)	<ul style="list-style-type: none"> • Able to facilitate complicated multi-party agreements that cross agency boundaries • More cost effective operations with lower overhead costs • Can overcome bureaucratic hurdles in programs • Less political • Can hold land for sale to an agency in increments over several years • Can obtain properties at bargain rates • Increased risk-taking abilities and expertise, quick discovery and response capabilities • Can supply volunteer help and expertise • Can be very local efforts with community-based approach 	<ul style="list-style-type: none"> • Lack of public awareness of private groups • Lack of permanency of private groups
Coalition	<ul style="list-style-type: none"> • Combines all the advantages of both government and non-government groups 	<ul style="list-style-type: none"> • Time-consuming and difficult to get diverse groups working together

2.4 Relevant Research and Research Needs

Chapter two has thus far described the importance, and potential effectiveness of private land conservation, and options available for its use and encouragement. What remains uncertain, however, is the best approach for implementing private land conservation, particularly in the Nova Scotian context. The following section discusses the current status of relevant research. It also presents research needs related to the topic of private land conservation generally, and specific variables, research approaches, and methodologies applicable to my research.

2.4.1 General Overview of Related Research

The literature relevant to this study is drawn from four main bodies of work. First, literature is drawn from broader research on environmental attitudes and behaviour. This literature includes studies of the importance of environmentally-based ethics, beliefs, attitudes and knowledge in influencing environmental behaviour. It also includes studies of socio-demographic variables influencing environmental attitudes and behaviours. A substantial number of empirical studies have been undertaken in this area, beginning in the early 1970s. This literature provides insight into potentially significant variables influencing participation in private land conservation (see 2.4.2).

The second body of work relevant to my research encompasses a relatively recent and growing body of literature focused on the tools and techniques of private land conservation (see Appendix 7). Numerous private land trusts and stewardship programs have also published handbooks on options available to landowners (e.g. Hilts and Moull 1988; Hilts and Reid 1993; Island Nature Trust 1989; Land Trust Alliance 1993; Ontario Heritage Foundation 1990). Overall this work is useful in providing background information on the options available for private land conservation. It does not, however, provide information on the applicability of the various techniques, feasibility or considerations for their use in a particular context.

The third body of literature relevant to my research is the very limited work related to landowners and conservation within the Nova Scotian context. There have been no studies of basic landowner attitudes and values about land, land ownership, environment or

conservation in the Province. The only existing studies are woodlot owner surveys related to forestry policy, and studies of land use and land capability for the purpose of planning (i.e. Redpath 1974; Wellstead and Brown 1993). There was a review of conservation tools available in the Province and a draft provincial stewardship plan, but these were done with little landowner consultation (Milton 1995a). There is also a report on the Wetland Stewardship Program for Nova Scotia (MacDonald 1990), and a report on landuse planning options for conservation (Evans 1992).

The most relevant literature for my research is a relatively recent body of literature focusing specifically on private land stewardship and conservation efforts. The number of studies in this area has continued to rise since the first few studies in the early 1980s. Research has tended to be very practical and focused on answering a specific question for a particular program and context. It includes several empirical surveys associated with existing private conservation efforts across Canada (e.g. Brechtel and Anderson 1987; Brusnyk et al. 1990; Hilts and McLellan 1984; Hilts 1989, 1991a; Melinchuck 1987; Morgan 1985; Moull 1987; Russell and Eskowich 1989; Van Patter et al. 1990; Waddell 1990) and the United States (Danielson and Leitch 1986; Gobster and Dickhut 1988; Scenic Hudson Inc. 1986). There are other landowner studies that have been done throughout North America, without affiliation with an existing program (e.g. Bardecki 1984; Farris 1992; Mitchell and Labaree 1991; O'Connell and Noss 1994; Rakowski and Massey 1993). A significant amount of the related work is not empirically based. It is mostly related to potential obstacles to private land conservation (e.g. Atkinson 1986; Caza 1993; Comozi 1991; Cox 1989; Elfring 1989; Evans 1992; Farris 1981; Filyk 1992; Goodier 1986; Harris 1994; Haymond 1990; Maynard 1995; Shelton 1981; Svoboda 1981). The literature also includes several important studies from Britain and New Zealand that offer insight into private land conservation issues generally (e.g. Cutting and Cocklin 1992; Edwards 1994; Edwards and Sharp 1990; Van Vurren and Roy 1993; Willis et al. 1988).

Many existing studies have a much narrower focus than the broad issue of enhancing private land conservation, and they are usually one of three types. Some of the studies focus on a particular type of stewardship such as habitat enhancement for waterfowl or

fish. Others focus on a particular kind of landscape, predominantly wetlands (e.g. Bardecki 1984; Danielson and Leitch 1986; and Kreutzwiser and Pietraszko 1986). Other work focuses on specific factors influencing private land conservation, such as knowledge or attitudes of landowners towards the environment, or attitudes towards particular tools and institutional arrangements. The works by Hilts (1984 and 1989), Morgan (1985), Melinchuk (1987), Moull (1987), and Scenic Hudson Inc. (1986), for example, focus specifically on landowner attitudes towards protection strategies (tools) in a specific geographic region. Brusnyk et al. (1990) compare participants and non-participants in a habitat project on private lands. Bardecki (1984), focused on the influence of incentives on participation in conservation efforts. Overall, the existing work on landowners and private land conservation is not extensive, nor sufficiently comprehensive for application in Nova Scotia. A few studies have begun to examine the issues of private land conservation in a broader context. They have initiated efforts to synthesize work of other researchers to provide a general framework for private land conservation. The best example is the work by Hilts based on private land conservation efforts in Ontario (Hilts 1991a, 1992, 1993a). Each of the variables potentially influencing private land conservation is discussed in the following section. For the reader seeking specific information on relevant studies, tables are included in Appendix 2. These tables list each study, author, date and major findings for each of the variables presented in this chapter.

2.4.2 Variables Influencing Private Land Conservation Efforts

2.4.2.1 Landowner Attitudes about Conservation

Research focusing specifically on environmental concern demonstrates the important linkages between underlying values, beliefs and attitudes, and resulting behaviour and decision-making related to the environment, environmental management and conservation. Understanding these underlying factors can be important in planning and developing conservation strategies. There have also been several specific studies of landowners to assess attitudes towards conservation (see Table 31 in Appendix 2). These studies suggest relationships between positive attitudes towards the environment and a greater support for nature conservation, and participation in private land conservation efforts. The results of the studies have varied significantly, however, in terms of how much these concerns and attitudes influence actual behaviour. One study even suggests that such a relationship does not apply in the environmental domain. There is also disparity in the findings in terms the strength of conservation attitudes among rural landowners, the degree of a conservation ethic present in landowners, and the issues of most concern to them. Some studies have demonstrated that landowner characteristics and characteristics of the land base influenced attitudes about conservation.

Although there have been no studies of landowner attitudes towards conservation in Nova Scotia, there have been studies that indicate that Nova Scotians are concerned about wildlife issues (Environment Canada-Canadian Wildlife Service et al. 1993). The economy and way of life of many Nova Scotians has been shaped by their relationship with the land and its resources, resulting in strong ties to the land (Nova Scotia Department of Natural Resources 1994; Public Review Committee 1995).

2.4.2.2 Landowner Knowledge about Conservation

Landowner knowledge about the environment, conservation generally, and private land conservation specifically, has been highlighted as an important variable influencing landowners' attitudes and decision-making about private land conservation (see Table 32 in Appendix 2). Some studies have concluded that landowners have a very low level of environmental knowledge relating to conservation issues, while others indicate that

landowners are quite knowledgeable in this area. The discrepancy between these studies indicates a need for further research and refinement of measures used. There has been no study of landowners' knowledge of options and strategies for conservation on private land and the degree to which a lack of such knowledge could inhibit private land conservation.

2.4.2.3 Landowner Concerns

Studies indicate that landowner concerns are a key influence on participation in private land conservation (see Table 33 in Appendix 2). The disparity and conflict between private rights to land and public rights of wildlife, together with the conflict between landowner rights and landowner responsibilities for conservation, can inhibit conservation efforts. The pressures of our growth-oriented society and increasing global and national pressure to protect natural heritage heighten these conflicts. Many landowners in western societies continue to hold to the historically predominant view of their rights of dominion over their own land, and the notion of private ownership of one's home and "castle." Landowners may be reacting to a perception that landowner rights are being eroded and that there are too many demands and restrictions on them and on their use of land. It is increasingly apparent to some that this traditional view is becoming irrelevant and even harmful. Although several authors suggest that landowner attitudes about their rights as landowners influence participation in private land conservation, there are no empirical studies to support them.

Other landowner concerns highlighted in the literature relate to fears of the negative consequences of participation in conservation related to liability, property damage, invasion of privacy, and restrictions on land use options.

2.4.2.4 Tools for Private Land Conservation

Even though the success of any conservation strategy is dependent on the support of private land owners, little is known about landowner receptivity to protection strategies (Cutting and Cocklin 1992; Elfving 1989; Kreutzwiser and Pietraszko 1986). The initial research reveals several general trends that offer useful insight for my research (see Table 34 in Appendix 2).

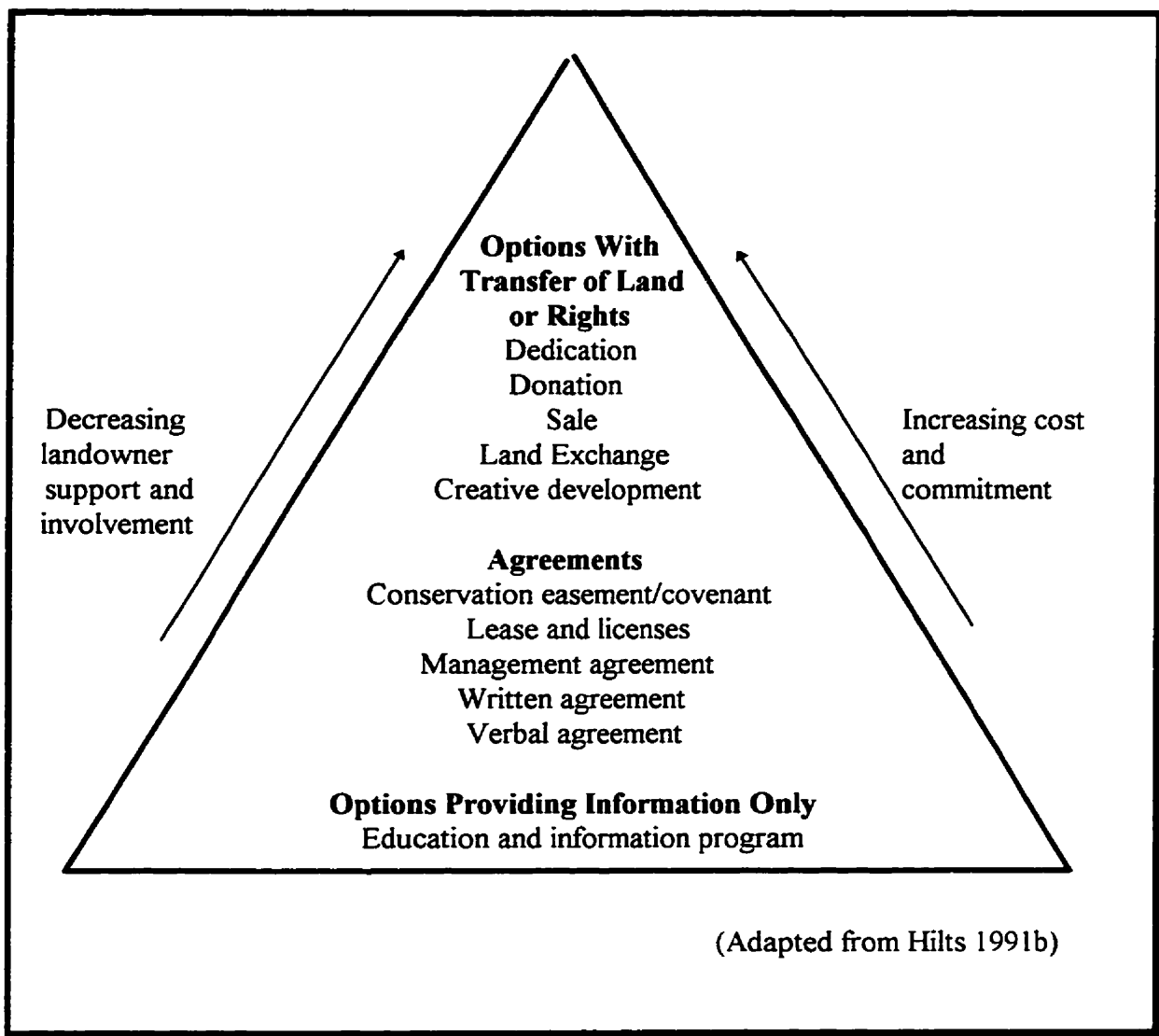
The studies indicate that there are a wide variety of tools available for private land conservation. They also indicate that care must be taken to identify appropriate mechanisms for specific situations. To accomplish program goals most effectively, public and private conservation institutions need a better understanding of how their constituencies will react to various private land conservation tools.

Within each study, researchers found a high level of agreement among respondents about support for particular strategies. Results have indicated a clear separation between the most and least preferred methods of protection. In general, studies reveal that most landowners show some support for protection measures. Landowners are particularly supportive of those strategies involving voluntary cooperation or direct benefit to owners. They prefer those which are least stringent, involve the least government interference, impose few restrictions, and leave landowners with many options. One study ranks the tools in terms of landowner preference and level of commitment required. The model, shown in Figure 5, demonstrates the varying levels of cost, commitment and participation involved in each tool according to the work by Hilts (1991b).

Studies also indicate that landowners perceive different options as having varying degrees of power in protecting nature. Landowner perception of the power of an option, however, was not indicative of their preference for that option. The most powerful options were the least preferred.

The results suggest that there is variation in landowner preferences between different regions and circumstances. Factors affecting attitudes towards the various conservation strategies have also varied between studies. Such factors include the perceived importance of receiving tax deductions and other economic benefits, and non-monetary incentives such as preserving land for personal pleasure and for future heirs. Personal variables related to the acceptance of and preference for various conservation strategies range from education, and age, to income, and occupation. Some studies have also suggested a relationship between land base characteristics including size of property, years of ownership, main land uses, economic importance of the land, and landowner preferences for particular conservation tools.

Figure 5: Tools for Private Land Conservation



2.4.2.5 Institutional Arrangements

Existing studies indicate that institutional arrangements may create obstacles to private land conservation. Alternatively, they may create disproportionate participation by some types of landowners (see Table 35 in Appendix 2). There may also be obstacles associated with an inadequacy of human, technical and financial resources within various institutions, and the lack of cooperation between agencies and groups.

Landowner preferences for institutional arrangements revealed patterns within geographic areas, and for specific landowner and land base characteristics. Between

studies, however, there was variation in preferences. One study also revealed that landowner perceptions of the effectiveness of various institutions for private land conservation differed from their preferences for particular institutions.

2.4.2.6 Landowner Characteristics

Research demonstrates that landowner characteristics are important variables in determining people's attitudes towards nature, the environment and conservation. These variables include age, education, gender, socio-economic status, occupation, cultural background, political orientation, and geographic location and size of residence (see Table 36 and Table 37 in Appendix 2).

The results of studies on landowner characteristics vary. Some studies indicate that there is no consistent correlation between socio-demographic variables and environmental attitudes or participation in conservation. Other studies indicate that there is correlation, but different studies have found correlation between different variables.

2.4.2.7 Land Characteristics

The way a landowner views the environment and nature conservation, his or her preferences for conservation options, and conservation knowledge may be related to variables associated with land characteristics. These variables include property size, predominant land uses, the proportion of the property in a natural state and previous conversion of natural areas (see Table 38 in Appendix 2). There have been no studies of the relationship between characteristics of the land base and the owner's participation in private land conservation.

2.4.2.8 Participation in Nature-Oriented Activities

Researchers have found varied relationships between participation in conservation and participation in nature-related recreation (see Table 39 in Appendix 2). In some studies, researchers found that participation in non-consumptive wildlife-related activities was higher among landowners participating in private land conservation than for non-participants. Other studies, however, question this relationship. One study found a correlation between the practice of wildlife enhancement management and a belief in the

importance of hunting (Haymond 1990). This discrepancy may be explained by the differing interpretations of private land conservation based on either a preservationist or a conservationist (sustainable use, wildlife enhancement) approach.

2.4.2.9 Economic Obstacles to Conservation on Private Lands

There are also many possible economic barriers to private land conservation efforts and landowner participation. Private land conservation, being relatively new as a government issue, may not be given priority over other necessary government expenditures, despite its potential benefits (Cutting and Cocklin 1992). As a result, there is often inadequate long-term funding for private land conservation programs (Mitchell and Labaree 1991; Munro 1989).

The discrepancy between private and public benefits, particularly in combination with the high private costs involved, can inhibit landowner participation in private land conservation (Cutting and Cocklin 1992; Danielson and Leitch 1986; Thomsom 1986). The disparity is due to several factors. There may be direct subsidies for activities that damage the natural heritage value, or income protection plans and lower property taxes for non-conservation uses (Van Vuuren and Roy 1993; Willis et al. 1988). This disparity is also a result of the inability to receive payment for all of the preservation benefits originating from preserved lands but occurring outside their boundaries (Bishop 1981). For example, the natural area may provide benefits to harvestable wildlife that may migrate from the conserved area and provide a material benefit to someone else. Similarly, ecological benefits are a common good, but may be provided at a cost to the individual landowner who provides the conservation service. The difference between social benefit and private cost is even greater when difficult-to-value functions of nature are added to the analysis, such as the fact that the loss of a natural system or biodiversity can be an irreversible loss (Van Vuuren and Roy 1993). The specific factors that may influence private costs and benefits of conservation, and which have the potential to enhance such conservation are outlined below.

Additional Costs to Landowners

Participation in conservation may involve the opportunity cost of foregoing the right to use land and other resources without restriction. There may be time and capital costs associated with changing existing practices and acquiring knowledge necessary to undertake an effective conservation effort. There can be substantial costs involved in some conservation options, including costs for professional services and advice (Small 1992). Finally, there are costs incurred in monitoring and enforcing conservation.

Institutional Arrangements

Institutional arrangements and mechanisms available to the landowner can strongly influence both the magnitude and distribution of costs and benefits of conservation (Edwards and Sharp 1990). They determine such things as the type and nature of organizations available for holding easements and covenants, what costs are shared, what types of agreements may be provided to the landowner, and the timing of payments of incentives (Edwards and Sharp 1990).

Economic Disincentives

There are many disincentives which work against conservation on private lands including inadequate or inappropriate subsidies, policies encouraging the conversion of natural areas and poor tax treatment of conservation land and donations. These disincentives are often responsible for increasing the contrast between private cost and social benefit as discussed above (Madsen and Petterson 1987). These factors act as incentives to encourage landowners to convert natural habitats into more economically productive crop or pasture land, or to log the property (Brechtel and Anderson 1987).

Tax Issues

The importance of taxes in the protection of privately owned ecologically sensitive lands has been well documented (Denhez 1992; Rubec 1995). The two main taxes influencing conservation are income and property taxes. In Canada there is relatively poor tax treatment of donations of conservation land and this works against commitment to protected areas and protection of private lands (Denhez 1992). Gifts of environmentally

significant lands to a charity or government agency are subject to capital gains taxes because the Income Tax Act introduces a legal fiction stating that the donor has received proceeds on the gift. This erodes potential tax benefits. There is also poor treatment of protective measures other than gifts of land, such as covenants and easements, although the federal tax policy has theoretically enabled basic deductions for these gifts (Denhez 1992; Strong 1983).

Artificial numerical limits are also imposed upon the usability of the receipt for a gift of land for conservation (Denhez 1992). Specifically, donations cannot exceed yearly incomes and can be carried forward for only five subsequent years. A gift of land could be worth significantly more than an annual income (Small 1992).

Because of these legal fictions and tax rules, gifts of natural heritage are given substantially worse treatment than gifts of cultural heritage. Philanthropic expenditures receives worse treatment than business expenditures and political donations (Denhez 1992).

Fortunately, the federal government has recently made some changes to the tax system that improve the tax implications of private land conservation. More changes are also under consideration. Recent changes included lifting the ceiling of 20% of yearly income for gifts of land for conservation. Another change is to provide the option of donating land to an approved conservation organization and receiving full value for the gift as a tax credit. Previously such value was only achieved through donation to a government agency.

Capital gains payable on estates can also be very high, and can be an inhibiting factor for private land conservation. A gift of land to heirs can hold such high taxes that the heirs are forced to sell the land to cover the costs. This issue may threaten a family's long range plans for the land (Small 1992). There are no capital gains taxes payable, however, if the property is a primary residence.

Property taxes may inhibit private land conservation. Property taxes may be lowered once an easement or covenant is in place, but in Nova Scotia this decision rests with the Municipality. Since conservation easements or covenants are relatively new in Nova Scotia, there are few precedents in the matter. A tax break would mostly have symbolic

value in Nova Scotia since taxes on agricultural and forest resource lands are minimal. Current proposals to change the provincial taxation system, however, might increase rural land taxes. This could increase the value of property tax benefits. At the same time, such a change could discourage conservation charities interested in acquiring lands for conservation.

Incentives

Incentives are necessary in light of the economic issues discussed above, to compensate for the expenses, bother, and worry, taken on by the landowner, or to counteract competing incentives. Incentives which work for conservation include: actions that divert land, capital, and labour towards conservation, or smooth uneven distribution of costs and benefits of conservation. Other incentives provide mitigation of anticipated negative impacts on local people, compensation for losses, or rewards for positive actions (McNeely 1988).

Existing studies indicate the importance of economic incentives for increasing participation in private land conservation (see Table 40 in Appendix 2). The studies also highlight additional educational and advertising benefits of certain incentives. The appropriateness of using an incentive for a particular situation must be determined based on landowner preferences, and the strength of protection provided by the proposed strategy. Landowner preferences vary considerably. The literature indicates that personal characteristics and characteristics of the land base and land-use can influence preferences for particular incentives. Some studies indicate that incentives are particularly important to landowners who are not currently participating in a private land conservation program. Finally, an interesting trend in current studies is that landowners often rated more expensive incentives, such as cash for leases and easements, as excessive, even for legal agreements.

2.4.2.10 Other Influences on private land conservation

In addition to the variables described above, there are several other obstacles that may influence private land conservation (see Table 41 in Appendix 2). These relate to a lack of legal and political support for private land conservation, including resource policy.

Other obstacles relate to local issues and land use conflicts as well as inadequate resources and planning for conservation efforts.

2.4.3 Research Needs Identified Through Literature Review

The preceding literature review demonstrates that the variables to be considered in addressing private land conservation issues are:

- 1) Attitudes and knowledge about the environment/conservation
- 2) Attitudes and knowledge about tools, institutional arrangements, incentives
- 3) Private land conservation tools
- 4) Institutional arrangements
- 5) The economics of private land conservation
- 6) Social, economic, political and legal issues influencing private land conservation
- 7) Landowner and land base characteristics
- 8) Participation in nature-related recreational activities

The literature also provides insight into the most appropriate approach for research on private land conservation. As evident from the diverse findings of existing studies, the presence, magnitude, and influence of these variables must be examined within a specific local context (Harris 1994). A local context also enables effective conservation efforts that fit local circumstances and are sensitive to local needs. A local context enables agencies and organizations to set priorities for use of scarce funds, time and personnel (Atkinson 1986; Cutting and Cocklin 1992; McNeely 1988; Rakowski and Massey 1993; Rousseau 1990). At the same time, conservation efforts must recognize and address the broad socio-political issues, such as government regulations, and incentive programs that may influence private land conservation within a specific context (Bardecki 1984; Cox 1991a; Lacey et al. 1988).

An increasing emphasis is being placed on the need for meaningful cooperation between conservationists and local communities (Biodiversity Science Assessment Team 1994; Caza 1993; Dottavio et al. 1990; Harvey 1993; Herman 1993; Rousseau 1990; United Nations 1992). This participation is essential to build the support and trust of local communities, and to ensure that local issues and concerns are addressed. Existing landowner contact programs indicate that landowners may value the process of consultation and cooperation even more than the content of the particular conservation issue (Hilts 1993a). A lack of a landowner consultation and positive relationships with landowners has hindered progress with previous conservation efforts (Canadian Environmental Advisory Council 1991; McNeely et al. 1990; Rousseau 1990). Private land

conservation research and programs should therefore be carried out with meaningful involvement by the local community.

Existing studies have been narrowly focused on a particular geographic area or landscape type, or on one particular issue in private land conservation, such as attitudes about strategies or institutional arrangements. These studies do not examine the various factors influencing private land conservation efforts in an integrated way. Some studies have focused on identifying landowner preferences for a particular issue, but none have taken a broad view of what encourages or inhibits private land conservation. Research is needed that attempts to synthesize the significant variables identified in previous work, and provides opportunities to identify potential new variables. By addressing private land conservation issues in an integrated and holistic way, needs can be identified, priorities can be determined, and a coordinated, cooperative approach can be created to enhance private land conservation efforts for the particular context being studied.

A related gap in existing research is the absence of an integrated analysis of different perceptions of private land conservation issues and enhancement strategies. Most studies provide solely the perspective of a random sample of landowners who have lands of interest to conservation. Alternatively, they provide solely the perceptions of one or two specific agencies or organizations involved in private land conservation. There should be a synthesis of at least three groups of people whose perceptions strongly influence the success of private land conservation: landowners who are potentially (but not currently) involved in private land conservation, landowners who already have some experience with such conservation, and individuals who are professionally associated with the process of private land conservation efforts (government agencies, non-government conservation groups and academics). Finally, existing studies have generally not provided much opportunity for landowners to explain their positions and reasons for particular decisions, nor to provide their own ideas on how to enhance private land conservation and stewardship.

Despite recognition of the need for conservation on private lands, and the need for innovative strategies to address conservation needs in Nova Scotia, there have been few attempts to determine the most effective approaches to encourage such conservation within

the Nova Scotian context. Since landowner needs and interests are diverse and vary between geographical regions, and economic, social and cultural situations across the country, a study within Nova Scotia seems vital for effective private land conservation in the Province.

2.4.4 Summary

Conservation on private lands is important in addressing current conservation challenges in many parts of the country, particularly in Nova Scotia. Private land conservation is significant in meeting the increasing demands for effective and sustainable natural heritage protection, at the same time as public funds and other resources available for conservation are decreasing. It has the potential to provide a viable alternative to some of the economic, technical and political challenges facing conservation. Private land conservation does not require public acquisition and publicly funded management, and it encourages cooperative funding efforts.

Private land conservation is essential in enabling an ecosystem management approach for existing protected areas. It can help to ensure the sustainability of protected areas, strengthen the capacity to conserve natural heritage, and protect land that public acquisition and protected areas-based techniques may not be able to protect. Private land conservation contributes to the protected areas agenda by filling critical gaps in the protected areas network to ensure a more complete and ecologically viable system. It enables the protection of a wider range of ecosystem and landscape types, a larger percentage of the Province, many of the ecologically important sites and much of the Province's biodiversity. It increases the potential of protecting at least the commonly supported national and provincial goal of 12%. It also provides "buffers" around existing protected areas by protecting smaller tracts of land surrounding and/or connected to parks and larger protected areas.

Private land conservation addresses the serious implications of the high proportion of private land ownership in some areas of Canada, including Nova Scotia. It also addresses the issues of the ecological significance of private lands and the threats that they face. Finally, private land conservation provides many additional and important benefits which work to further conservation efforts by developing working relationships with landowners and strengthening conservation ethics and support. It provides a context for enhancing attitudes and knowledge that have inhibited past conservation efforts.

A review of current experience and research indicates that private land conservation is an important and viable strategy for nature conservation. Private land conservation

offers a diversity of tools, incentives and institutional arrangements that can be used to encourage landowner involvement, and to meet diverse landowner needs and interests.

Review of relevant literature indicates that results from previous studies on attitudes, behaviours and knowledge relevant to conservation have been inconclusive and conflicting. They have, however, provided insight into the potential variables influencing private land conservation. They have also demonstrated the geographic variation in the influence of such variables on private land conservation. There is, therefore, a need for research to identify significant influences on private land conservation and methods of enhancing conservation efforts. This research must be specific to the Nova Scotian context and address local circumstances, issues and concerns. It must integrate the variables identified in other studies as influencing private land conservation. It must also integrate the perspectives of both landowners and individuals involved in the administration of private land conservation efforts.

3. CHAPTER THREE: HANTS COUNTY PROFILE

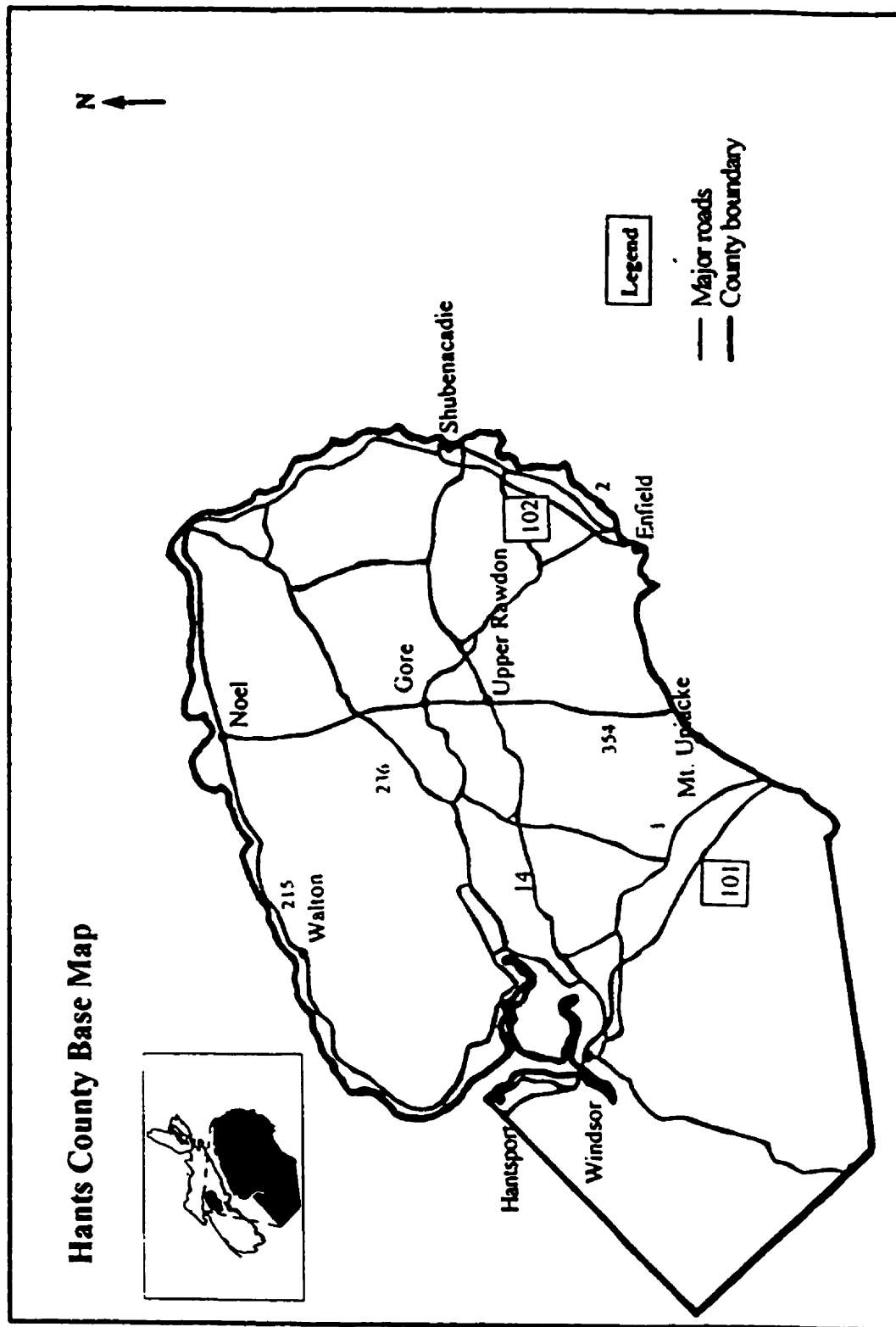
3.1 Location and Landscape

The case study for my research is based in Hants County. I selected this county because it has only one existing protected area of value to natural heritage conservation, and no areas designated under the Parks And Protected Areas Systems Plan. It contains ecologically significant features and eight natural landscapes that are not represented in the proposed Protected Areas Systems Plan (MacKinnon, personal communication). It provides an example of an area where private land conservation is essential to effective nature conservation.

Hants County is located in the middle of mainland Nova Scotia, between the Shubenacadie River, Minas Basin and Cobequid Bay. It occupies 3,054 km² or 317,580 hectares, which accounts for 16% of the Province. A base map of the country is provided in Figure 6.

According to the Natural History Theme Region classification, Hants County is predominantly Carboniferous lowlands, with some Triassic lowlands along the coast and some Atlantic Interior areas (Nova Scotia Department of Natural Resources--Parks and Department of Education--Nova Scotia Museum 1984). The landscape, therefore, consists of lowland plains, rolling uplands and coastal fringe areas. The geology of the areas is mostly composed of Carboniferous sedimentary rocks covered with deep soils. Many of the river valleys are lined with Windsor Group rocks including gypsum that produces a special feature called karst topography. This topography is rich in sinkholes, channels and some larger caves. Higher lands contain more resistant sandstones. Flat lying areas are often ill-drained, containing numerous bogs overlying sandstones and shales (Nova Scotia Department of Natural Resources-Parks Division and Department of Education-Nova Scotia Museum 1984). In 1991, 77% of the landscape was forested, 19% non-forested and 4% water (Nova Scotia Department of Finance 1995). These figures may have changed significantly since then because of the rapid acceleration of forestry activities in recent years.

Figure 6: Base Map of Hants County



(based on data supplied by the Mineral Resources Branch, Nova Scotia Department of Natural Resources)

3.2 The History and People

The original inhabitants of Hants County were semi-nomadic First Nations peoples of the Archaic Indian group and later the Mi'kmaq group, including both Amquaret and Nocoot Tribes. Although these original inhabitants were severely affected by later settlers, some of their descendants still reside in the County (Vaughan Shand 1979). The second phase of settlement in the area began in the 1600s. It continued for the next two centuries with various successions of European settlers. These settlers included Loyalists, Acadians, planters from New England and the McNutt settlers from Ireland. Various individuals were also given large grants of lands as recognition for military, political or economic success in Nova Scotia. Their estates were subdivided and leased to tenant farmers, and the descendants of many of these original families, both the estate owners and tenants, still reside in the county (Vaughan Shand 1979).

Traditionally, settlements were located along the coast due to fishing and ship-building interests. These areas are still relatively populated today, in addition to ribbon type settlements along the major highways (Nova Scotia Department of Development 1986b). Although Hants County is highly rural compared to other parts of the Province, the number of rural non-farmers is increasing. At the same time the number of rural farmers and operating farms is decreasing (Nova Scotia Department of Development 1986a).

Socio-demographic variables provide some insight into the people and economy of the County. The population has always been relatively small, although it has grown at a stable rate from almost 29,000 in 1971, to almost 38,000 in 1991. There was rapid growth relative to other parts of the Province from 1960 to the early 1980s, and slower growth since then (Nova Scotia Department of Industry, Trade and Technology 1989). The ethnic background of Hants County residents reflects its history and the tendency for families to remain in the area. English is the mother tongue of over 98% of the population (Nova Scotia Department of Development 1986a). The average income is 27% below the national average in West Hants, and 16% below in East Hants. Low income families account for 10% of the total families (Nova Scotia Department of Finance 1995). The average level of schooling is below grade 13. Less than 20% of the population have some

post secondary education. The unemployment rate is about 10% for females, and 15% for males (Nova Scotia Department of Finance 1995).

Traditionally, the economy was based in farming, lumbering, ship-building and the quarrying of gypsum (Vaughan Shand 1979). Today the predominant economic activities are industry and mining (Nova Scotia Department of Development 1986b; Nova Scotia Department of Finance 1995). The main employers are: construction, product fabrication, assembling and repair, transport equipment operating, mining, quarrying, management and administration, service and sales (Financial Post 1994). Many residents, however, have to commute outside the County for employment. Other people have moved into Hants County yet continue to work in Halifax or other areas. The forest industry made a sudden increase in production in 1993, and continues to grow (Nova Scotia Department of Finance 1995). It is not a big employer, however, particularly because of increased mechanization and the trend for the larger companies to bring their own employees from out of the Province (Hebda, personal communication). The area has also developed recreational facilities, museums, picnic grounds, and camping parks in its effort to establish a tourist industry (Nova Scotia Department of Development 1986a).

4. CHAPTER FOUR: METHODS

My research aimed to address the problem of how to enhance private land conservation in Nova Scotia. The research was designed to synthesize the broader issues of private land conservation explored in the literature review, with the specific issues relevant to Nova revealed through a case study. My research questions included identifying the most important issues influencing private land conservation in Nova Scotia, and potential actions to address these issues. I collected the data to answer each of my research questions using questionnaire surveys as described below.

4.1 Study Population and Participant Selection

The sampling methods included a mixture of both random and selective sampling to ensure a broad and comprehensive perspective of issues related to private land conservation. The overall study population was limited to those individuals involved with or having potential to become involved with such conservation efforts. An effort was made to provide representation from each of three main sub-groups of this overall population who offer important and distinct perspectives on private land conservation. The three groups include: landowners who have potential to become involved in conservation efforts on their own land (“Hants County landowners”), landowners currently involved in or exploring involvement in such efforts (“involved landowners”), and government and non-government personnel working in or interested in the area of private land stewardship and conservation who could offer an organization/administration perspective (“conservation professionals”).

Specifically, the study population for the survey of landowners in Hants County included all non-corporate private landowners owning at least one ten hectare property with a minimum of ten undeveloped hectares. The specific criteria of lot size and the amount of natural area were intended to limit the survey to those individuals owning lands with a potential value for private land conservation. The criteria also limited the study to sites for which the commonly used conservation strategies are appropriate.

I established the study population using property maps and land ownership data obtained from the Land Resource and Information Services (Halifax, Nova Scotia). I

eliminated all properties in Hants County that were under ten hectares. I then used recent aerial photographs of the County to provide information on all areas that were no longer natural (i.e. developed). This information was transferred to a 1:50,000 topographic map. I then re-analyzed Hants County property maps and compared them with the map of developed areas. Subsequently, I eliminated all properties that did not have ten hectares of natural areas remaining.

The database of landowners that I initially received was inaccurate because of repeated listings of multiple owners, company names listed in different ways, misspellings and gaps in the database. I reorganized the database and determined that there were approximately 1800 families having natural areas over 10 hectares in size. In addition, there were 127 other landowners, not included in the survey (crown, private companies and businesses). From this total population, I selected 160 landowners using a random numbers table. The sample size for this stage of the research was an appropriate proportion of the total population to enable generalization of the results. The confidence level, based on a 50% return rate, was 90%, and the margin of error was 10% (Kish 1965).

The second landowner group provided representation from individuals across the Province who are currently involved in or exploring involvement in private land conservation efforts. The inclusion of these individuals was important since they are more familiar with the options available to landowners. They have already gained some experience in private land conservation and the methods and institutional arrangements available for private land conservation. They have also already made a decision that private land conservation is important to them. Therefore, they offer a different perspective on potential obstacles and methods of enhancing private land conservation. They may focus on different issues than those focused on by people who may not have such an interest. There was no guarantee that this representation would occur in a random sample of landowners in one County, particularly since the number of individuals involved in private land conservation in the Province is relatively small. The sampling was based on names provided by the Ministry of Natural Resources, the Nova Scotia Nature Trust, the Nature Conservancy of Canada, Ducks Unlimited and other "key informants" involved with

landowners through resource management efforts, environmental groups and local community contacts. Any individuals who were included in the Hants County landowner survey were to be eliminated from the second survey of landowners to ensure that no individual would be selected twice. However, this action was not required since no Hants County landowners were officially involved in private land conservation. Seventeen individuals were included in this sample group, based on both the number of individuals meeting the selection criteria and availability of sufficient information to contact them. Since the number of individuals included in this sample likely represents a large portion of the population fitting the particular criteria used, the results can be generalized with a fair degree of confidence (level unknown).

The third group included personnel from agencies and organizations involved in private land conservation. The sample included representatives from government agencies including the Department of Natural Resources (Parks Division and Wildlife Division), Environment Canada, Heritage Canada, and the Canadian Forest Service. Non-governmental organizations included the Nova Scotia Nature Trust, the Nature Conservancy of Canada, the World Wide Fund for Nature, Ducks Unlimited, the Atlantic Coastal Action Plan (ACAP) groups, local environmental and landowner groups, and academics who have worked in private land stewardship efforts. There were 39 individuals included in this survey group.

4.2 Research Instruments

The research instruments used in the study included both written questionnaires and personal interviews, with the former being the primary instrument. Written questionnaires were appropriate for providing a broad perspective on the issues relevant to the study and permitted access to a larger number of participants than personal interviews. I used two questionnaires in the study. One was designed specifically for the two landowner surveys (both Hants County landowners and involved landowners), to provide a landowner's perspective of private land conservation issues. The second questionnaire was designed for individuals involved in a professional, academic or volunteer capacity with private land

conservation. Both questionnaires and the consent card are included in the back pocket of this thesis. The accompanying correspondence is included in Appendix 1.

The questionnaires were primarily based on closed-ended questions. The responses were used to answer the research questions, and were based specifically on the 9 research sub-questions. There was also an opportunity for written comment, and verbal comments for those individuals who completed their questionnaire through a personal interview, or who requested a follow-up interview. These comments were used to provide anecdotal additions to the discussion of the results, but were not quantitatively analyzed.

Both questionnaires assessed attitudes towards various incentives and disincentives, organizations and tools for private land conservation using a five-point Likert scale of agreement. Both surveys also assessed the relative usefulness of various methods of enhancing conservation using a similar scale.

The questionnaire designed for conservation professionals also assessed attitudes towards potential obstacles to private land conservation efforts, and methods of addressing these obstacles (using a five-point Likert scale of agreement). These questions were not appropriate for landowners, who are not likely to be aware of these issues, and who do not have an administrative/program-related perspective.

The landowner survey collected additional data on personal, land, attitude, knowledge and behaviour variables. This information about landowners is important since private land conservation efforts depend on the support of landowners, and therefore must be based on a knowledge of the variables influencing their participation in private land conservation. Personal data was collected on the following variables: age, gender, education, occupation, income, location of residence, urban/rural background, duration of land ownership, and method of land acquisition. Information collected pertaining to the land itself included the size of the property, the major land uses, and conservation potential. Information on participation in conservation activities was obtained through questions relating to participation in nature-oriented recreational activities, membership in nature-oriented organizations and conservation programs, involvement in conservation practices, and future plans for the land. Responses were based on nominal categories.

I asked several questions to ascertain landowner knowledge related to private land conservation. These questions were scored on a five-point Likert scale. I added individual responses together to create a knowledge score. I used both individual and summated scores in the final analysis. The score was proven reliable in that there was a strong correlation between individual items and the summed score.

I assessed conservation attitudes using a range of questions addressing affective, cognitive and behavioural-intent elements. I measured environmental concern using a modified version of Van Liere and Dunlap's (1978) 12 item New Environmental Paradigm Scale. I reduced the number of items to six, and changed the wording to eliminate gender-sensitive language. I used a five-point Likert type scale of agreement for the measure, as in the research conducted by Scott and Willit (1991). The scores were tallied, with 30 indicating the highest environmental concern (some questions were reverse coded). However, in this study, two of the six items did not correlate with the overall environmental concern scale. These two items were: "Plants and animals exist for humans" and "Humans have a right to change the natural environment to suit their needs." It is possible that the summated score is not a reliable and valid measure of environmental concern. The individual items, which focus on particular environmental concerns, were used to supplement analysis using the tallied score.

Ideally all variables should be measured using tested and proven measures or scales (Van Liere and Dunlop 1981; Weigel and Weigel 1978). No previously used scales were adequate or appropriate for the particular concerns addressed in this study, except for the environmental concern scale. I created the scales for my study using ideas from the literature, advice from academics and conservation professionals and the results of the pilot study.

4.3 Procedure for the Study

The first stage of the research involved contact with "key informants" in Hants County, and in several non-governmental organizations and government agencies, to provide background information and to assist in the design of the questionnaire. Then I conducted a pilot study with individuals from all three survey groups and with individuals

having extensive experience in social science research. I made appropriate modifications to the survey based on feedback from this pilot study.

For the random survey of landowners within Hants County, I mailed out an introductory letter to explain the research. The letter also indicated that I would be calling within a week. I enclosed a copy of the questionnaire, and gave landowners the option of completing it independently, or with assistance from me during a personal interview. Approximately one week later I telephoned each landowner to determine his or her interest in participating. I attempted to find out reasons for non-participation. For those landowners interested in participating, I confirmed the name of the appropriate person to complete the questionnaire, and whether the land still contained natural areas. I also set a time and date for the interview or for picking up the completed questionnaire, and asked directions to his or her home. The questionnaires were then completed through the interview process, or collected once completed by the landowner. I arranged follow-up interviews if requested.

For the survey administered to involved landowners, and the survey of personnel in agencies and organizations, I made some alterations to the survey approach. Since I expected the response rate to be high for these groups, and since respondents were less likely to need assistance reading the survey, I did not telephone respondents. I also did not offer them the choice of an interview to complete the questionnaire, however, I did offer them a follow-up interview. I sent a reminder post card one week after sending the introductory letter and questionnaire, and a second questionnaire and letter three weeks later if I had not received a response by then.

The follow-up interviews provided an opportunity for qualitative analysis and a more in-depth examination of the particular issues revealed as significant in initial results analysis. The interviews were semi-structured, and were similar for each survey group.

4.4 Survey Response

The response rates for the three survey groups conducted were quite high for a survey of this type. Sixty-four Hants County landowners, or 48% of the sample (for whom contact information was available), responded to the survey. Over half of the non-response

was associated with perceptions of being 'too old' to complete the survey, or not having enough land with conservation value. Fifty-three percent of the resident landowners (within Nova Scotia) chose to complete the survey by personal interview. Another nine percent filled in the questionnaire on their own and I picked it up for them, answering questions and providing information as required at that time. The remaining 27 percent of resident landowners, and the 11% who were non-resident, completed the questionnaire on their own and returned it by mail.

The response rate for the survey of involved landowners was 88%, and included 15 respondents. The response rate for the survey of professionals was 73%, or 39 respondents. All questionnaires for these surveys were completed by the respondents and returned by mail.

4.5 Limitations and Delimitations

There were several limitations of the study, based on factors beyond my control. First, the study attempted to measure several complex concepts, for which there was no valid or reliable scale in the literature. I measured the concepts using items I created. Their reliability and validity are therefore uncertain.

Second, there were time and financial limitations, which limited the scope of the research to a case study. Strictly speaking, since I used a case study approach, the findings of the study apply only to the study population in Hants County. It is possible that regional differences could affect the applicability of generalizations of the research outcomes for other areas of the Province. It is likely, however, that many of the findings offer important insights for the Province of Nova Scotia and add to the general literature in the field.

The study was also limited by the population data available for the Hants County survey. The data on property ownership was incomplete and it was not possible to find either telephone numbers or current mailing addresses for 18% of the sample.

I also set certain delimitations on the research. I limited the study population to landowners having natural areas over 10 hectares in size. My intent was to exclude landowners from the survey with no potential or limited potential for involvement in private land conservation because their land was too small or too developed to be of conservation

value. This approach, however, may have eliminated some landowners who have smaller areas but may have a strong interest in private land conservation or may have land of value to conservation. I also limited the study within Hants County to non-corporate landowners. I did not include large private owners including mills, forestry companies and other business interests, yet they are very significant in the future of private land conservation. I set this delimitation to keep the data base manageable. Furthermore, there are completely separate issues involved in corporate stewardship.

The conservation strategies considered in my research included only those options available directly to landowners, such as agreements and education programs. I did not attempt to cover the broad, publicly controlled strategies such as land-use planning and legislation.

4.6 Data Analysis

I analyzed the survey data using both qualitative and quantitative methods. I used the SPSS/PC statistics program for analysis (Minum and Clarke 1982; Norusis 1988). I used non-parametric tests to test for relationships between variables rather than parametric tests because of the non-standard distribution of many scores. Non-parametric tests make minimal assumptions about the underlying distributions of the data. The specific tests used were the Kendall Correlation test, Kruskal Wallace One-way Analysis of Variance and the Mann-Whitney U-test. The Kruskal Wallace test was used as an alternative to one-way analysis of variance. The Mann-Whitney U-test was used in place of the t-test. The Kendall Correlation test was used in place of other tests of correlation for interval level data. Statistical procedures were tested at a confidence level of $p < 0.05$. I rounded off percentages to the nearest whole number, and excluded non-responses from the data tables.

I began the data analysis by using descriptive statistics including frequencies, mean, median, standard deviation, cross-tabulations and chi-square, to describe the characteristics of participants in each survey group. They were also used to describe responses for each of the research subquestions. For each subquestion I also examined differences in responses between the survey groups using the Kruskal Wallace test. This comparison was important to determine whether or not conservation professionals were in touch with

landowner perspectives, and to reveal any significant differences between the three perspectives.

The descriptive statistics were also used to reveal patterns in responses which indicated possible relationships between other variables. These indications, as well as potential relationships between variables revealed in the research, were then examined for each of the research sub-questions (i.e. what variables related to conservation attitudes, or what variables related to conservation knowledge). These relationships were measured using the Kruskal Wallance Test or Kendall's Correlation (depending on the level of measurement of the data). This comparison helped to identify significant sub-groups of respondents with different needs, concerns or interests. The survey results are presented in this same order: a description of the overall results for each research subquestion, a comparison of groups, and a description of the variables related to responses.

5. CHAPTER FIVE: RESULTS

5.1 Conservation Status in Hants County

Before presenting the results of the survey, I have summarized the general findings of background research that highlight the need for private land conservation in Hants County.

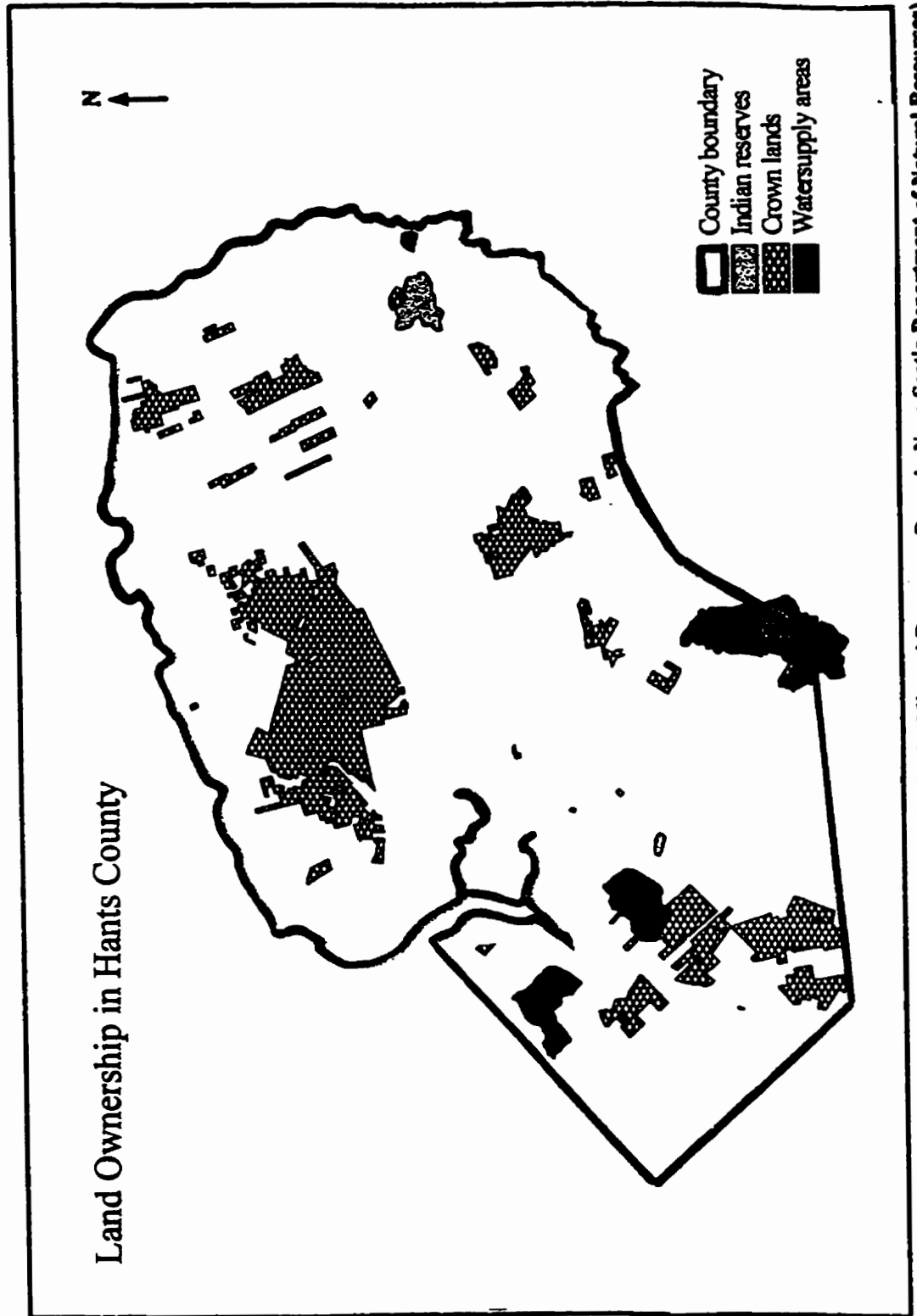
5.1.1 Land Ownership and Land Use

Land ownership in Hants County is predominantly private, including large forestry companies, smaller local forestry operations and family-owned private lands (see Figure 7). Many of these private lands are subject to resource extraction and other pressures. Many are owned or used by forestry companies, or are private woodlots.

All of the crown land in the County, other than a small amount in park reserve, is potentially licensed at any one time to corporate forestry interests. The licenses are based on timber volume commitments, and therefore the areas are not geographically distinct and cannot be shown on a map. The three license holders at the present time are Canexel (ABT Hardboard), Mactara, and Russell White. There are also substantial amounts of crown land under timber agreement with forestry companies.

There are several concerns in the Hants County community related to land use and ownership that have implications for private land conservation. In the more developed areas there is competition between farmers and residential land uses. Urban sprawl and increased development are occurring in areas that have been hitherto agriculturally productive. There are political pressures that encourage such development (Gilles, personal communication). Land use planning has not been proactive with respect to the environment (Gilles, personal communication). The Provincially significant trend of accumulation of land or logging rights by forestry corporations is particularly prevalent in Hants County (Hebda, personal communication). Landowner concerns related to resource use trends are outlined in the discussion of issues below (section 6.3.2).

Figure 1: Land Ownership Patterns in Nova Scotia



5.1.2 Ecological Significance

The County contains eight of the 77 distinct natural landscapes of the Province, identified through the Parks and Protected Areas Systems Plan (see Figure 8). These landscapes include the South Mountain Slope, South Mountain Granite Rolling Plain, Cobequid Tidal Bay, Walton River Clay Plain, Shubenacadie River Rolling Hills, Central Interior Slate Ridges (Rawdon Hills), Central Quartzite Hills and Plains (Shubenacadie Lake), and the Central Drumlins. None of these landscapes are represented in any existing or proposed protected areas. Private lands are vital if the protected areas system is to provide representation of all its unique natural landscapes (Leduc and Smith 1992).

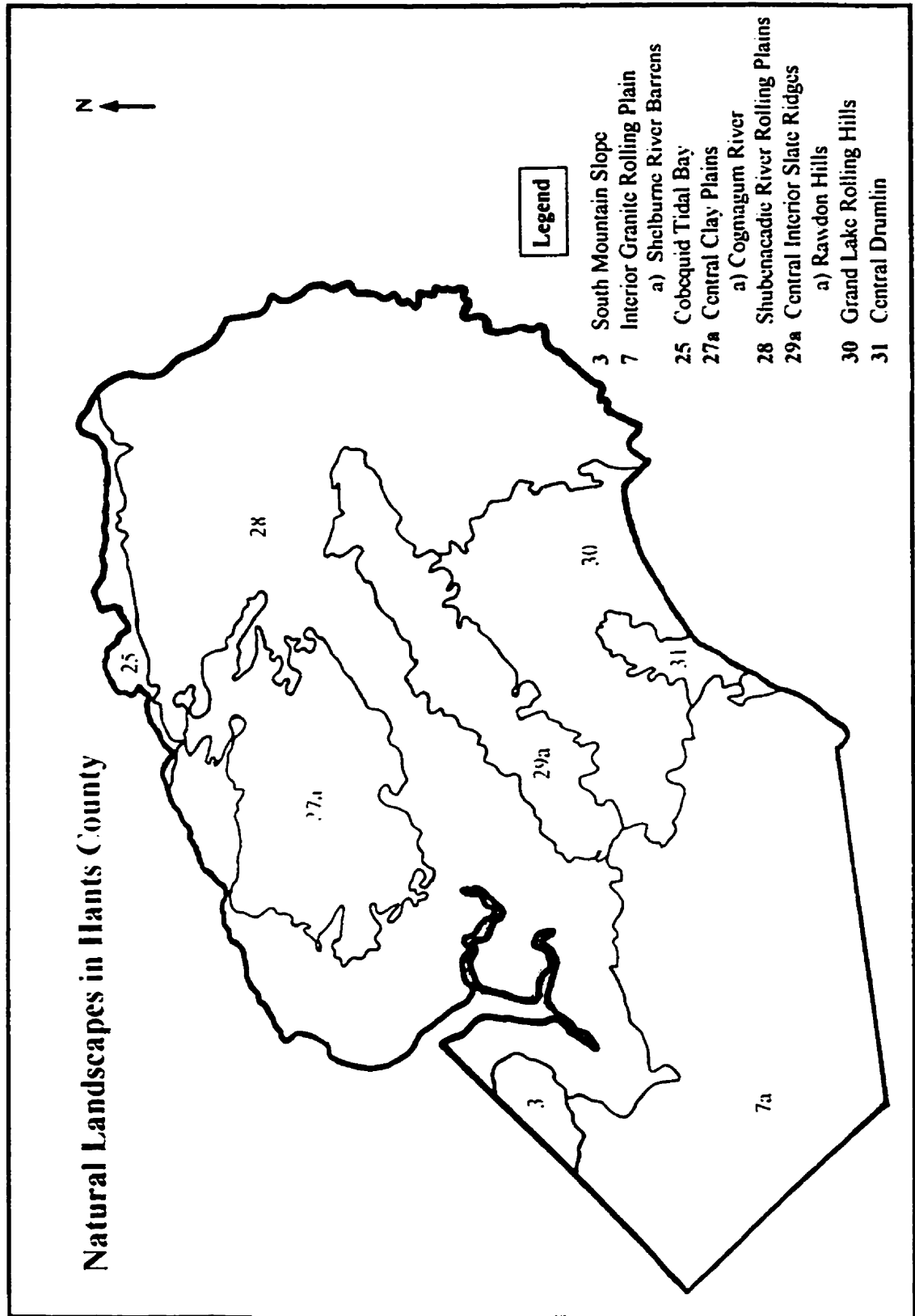
The County has some unique features, including the North Windsor salt marshes, and the gypsum cliffs and other geological formations along the Minas shore. Some of the significant ecological features, such as old forest sites, nesting sites, beaver lodges and wetlands, have been identified and mapped for the County by the Department of Natural Resources, but most remain unprotected. Many of these features occur on private lands (Leefe 1992). All five non-designated I.B.P. sites identified in the County occur exclusively on private lands (MacKinnon, personal communication).

There are several relatively large natural areas remaining in the County, although recent logging activities may have fragmented many of these during the past few years (Lynds, personal communication). Since so much of the County is in private ownership, it is likely that private land conservation will be needed to protect some of these larger areas.

5.1.3 Conservation Activities

Hants West Wildlife Habitat Advocates is one of the conservation groups active in the County. They promote and implement projects to improve habitat for various species of wildlife. Examples of their work include enhancing trout populations, improving abandoned wild apple orchards, planting trees and working on an Adopt-a Stream project (Hants West Wildlife Habitat Advocates 1996). The Windsor Tree Commission focuses on tree planting efforts. The local branch of the Nova Scotia Wildlife Federation focuses primarily on habitat issues related to game species. Although there is some interest in

Figure 8: Natural Landscapes in Hants County



private land conservation, there is not strong institutional support for it at the present time. There is currently no local land trust or group qualified to hold conservation easements within the County.

Hants County has only one designated protected area appropriate for nature conservation. This is Panuke Lake, an area of old forest protected as a nature reserve under the Special Places Act. Hayes Cave is a park reserve, significant for its karst features and rare plants. The only designated parks in the County are 4 provincial parks. Anthony, Mt. Uniacke and Falls Lake are small day use sites. Smiley's Provincial Park is a 100 hectare camping park.

5.1.4 The Need for Private Land Conservation in Hants County

In summary, there is a paucity of protected areas in Hants County. Private lands seem to be important to conservation in Hants County, based on the amount of privately owned land and its ecological significance. The crown lands are not likely to be protected for conservation. They were not selected in the Parks and Protected Areas Systems Plan and they are currently being used, or could potentially be used, for resource extraction activities.

Throughout Nova Scotia, the urgency for private land conservation is increasing as trends in the forest sector force more private landowners to sell off their land or logging rights, or force them to clearcut their lands immediately. Recent mineral finds in East Hants threaten some areas with future strip mining operations. Economic and social trends make it increasingly difficult for younger generations to remain in the area, and increase the likelihood of resource extraction and sale of family lands. Other relevant issues and concerns are discussed in detail in Section 6.3. These issues and concerns illustrate the need for the educational and attitude-related benefits of private land conservation.

5.2 Summary of Questionnaire Results

My research aimed to address the problem of how to enhance private land conservation in Nova Scotia. My primary research questions were, “What the most important issues are that influence private land conservation in Nova Scotia?”, and “What actions can be taken to address these issues?” To find these answers, I used the surveys to first answer the sub-questions:

- 1.1) What are landowner attitudes related to private land conservation?
- 1.2) What is landowner knowledge related to private land conservation?
- 1.3) Which conservation tools are appropriate for Nova Scotia?
- 1.4) Which institutional options are appropriate for Nova Scotia?
- 1.5) What factors encourage participation in private land conservation?
- 1.6) What factors discourage participation in private land conservation?
- 1.7) What are the challenges facing private land conservation efforts?
- 1.8) What recommendations can be made to enhance private land conservation?
- 1.9) What variables relate to participation in private land conservation?

The following section presents a summary of the survey results corresponding with each of these sub-questions. The sections I used to present the results also correspond with the sections of the two questionnaires, so the reader can readily see where the results were obtained. The implications of the results for addressing my main research questions, as well as the sub-questions outlined above, are presented in the discussion in Chapter Six.

For each section, I first present the overall results and patterns in responses related to the particular issue. I then present summaries of the differences in responses between the three survey groups and between sub-groups of conservation professionals. Finally, I summarize the variables which related to each issue.

I rounded off all responses to the nearest whole number, and excluded non-responses from the data tables. I included results showing differences between groups of respondents although I recognize that some of these differences were likely due to the different contexts of responses. Landowners responded about themselves personally, not about landowners in general. Professionals responded about landowners in general and therefore may perceive an issue as important, even if it only affects a small portion of landowners. I

compared the groups to bring together all of the various viewpoints, and to recognize the diverse perspectives of each survey group.

Because of the vast amount of data collected, I only presented the most important and relevant findings in this chapter. For readers interested in more detailed information about the findings, frequency tables for all responses are included in Appendix 3. Tables showing relationships between variables (correlations and differences between sub-groups) for all of the variables in the study are included in Appendix 4. Tables showing significant differences between responses of the sub-groups of professionals are included in Appendix 5. I begin the presentation of results with a general profile of the survey groups.

5.2.1 Profile of Survey Groups

The first survey group consisted of 64 Hants County landowners. The landowners were predominantly married males, over 50 years old, with children. Over 40% worked in resource-based occupations. Incomes and levels of education ranged from low to high, although 20% had incomes under \$15,000. Over 76% had less than post secondary education and 38% had less than high school education. Most Hants County landowners had a rural background and lived year round on their Hants County property. Many of them had been landowners for over 10 years and they depended on their land economically. Over 40% acquired their land through their family.

The 15 respondents in the survey group of landowners involved or interested in private land conservation (“involved landowners”) included a mix of males and females, mostly over 50 years old. Sixty percent of the respondents were married and 80% had children. They were more likely to have higher incomes than Hants County landowners. None of them were in the under \$15,000 income bracket, and most earned above \$35,000. Involved landowners were more likely to have a higher educational level than Hants County landowners. Seventy-three percent had post-secondary education and none had less than high school education. They were also more likely to come from a non-rural background than the Hants County landowners. None of the respondents in this group worked in a resource-related occupation and many were professionals. Some were permanent residents on their rural property, but many were seasonal or absentee owners. They were less likely to be economically dependent on their land and more likely to have purchased their land rather than to have acquired it through family. Table 8 summarizes the profiles of both landowner groups.

Table 8: Profile of Landowners-Personal Characteristics (n=79)

<i>Variable</i>	<i>Possible responses</i>	<i>Hunts landowners (%) (n=64)</i>	<i>Involved landowners (%) (n=15)</i>
Gender	Male	80	53
	Female	11	40
	Both male and female household members responded	8	7
Age	Under 30	0	0
	30-50	27	13
	Over 50	72	87
Marital status	Single	2	13
	Married	92	60
	Other	3	20
Children	Yes	94	80
	No	6	20
Occupation	Resource-based (forestry/farming)	41	0
	Professional	13	27
	Other	31	73
Income	Under \$15,000	20	0
	\$15,000-24,999	20	7
	25,000-35,000	17	13
	Over 35,000	31	60
Education	Primary school	38	0
	High school/trades	38	27
	Post secondary	22	73
Background	Rural	78	33
	Non-rural	22	67
Size of property	Under 50 ha	44	33
	50-200 ha	41	33
	Over 200 ha	16	20
Remaining natural area	Under 25%	13	7
	25-75%	34	27
	Over 75%	42	53
Economic importance of land	Not at all important	36	60
	Somewhat important	34	27
	Very important	28	13
Land of value for conservation	Yes	61	73
	No	31	27
Years of ownership	Less than 5	3	7
	5-10	13	13
	Over 10	84	73
Method of acquisition of land	Through family (bought/inherited)	42	13
	Other method	58	86
Residence	Permanent	70	40
	Seasonal	8	47
	Absentee ownership	20	13

The 39 respondents in the survey of professionals included an even combination of government and non-government individuals. It included people associated with private land conservation academically, professionally, through volunteer work, personal experience as a landowner and personal interest (see Table 9).

Table 9: Profile of Conservation Professionals

<i>Variables</i>	<i>Possible Responses</i>	<i>Responses (%)</i> (n=39)
Involvement with private land conservation	Academic	26
	Professional	74
	Non-governmental organization	46
	Experience as a landowner	31
	Personal interest	51
Affiliation	Government	
	federal	9
	provincial	39
	municipal	<u>3</u>
	<div style="text-align: right;">Total</div>	51
	Non-government	
	land trust	10
	local community group	17
	other	<u>21</u>
	<div style="text-align: right;">Total</div>	48
Resource-orientation	conservation/resource-oriented	26
	preservation-oriented	67

5.2.2 Attitudes Towards Conservation

Summary of Responses

The first section of the questionnaire for both landowner groups (landowners' questionnaire: page 1) asked respondents how much they agreed or disagreed with statements about the environment and conservation. Their responses are summarized in Table 10. Frequency tables of responses are included in Table 42 and 43 in Appendix 3).

(Note: the number preceding each of the statements in the tables in this chapter corresponds to numbered statements in the questionnaire).

Table 10: Conservation Attitudes-Summary of Responses (n=79)

Over 80% of all landowners agreed with the statement:

- 2. The balance of nature is very delicate and easily upset
- 5. Humans are severely abusing the environment
- 7. I am concerned about the future of the natural environment in Nova Scotia
- 8. I think nature conservation is important
- 11. Landowners have a responsibility to take care of their lands to protect nature
- 12. How we use our private land affects other people's land
- 13. I think private lands are important for effective nature conservation in Nova Scotia
- 14. Landowners should be encouraged to manage their resources in a sustainable way
- 15. Landowners should be encouraged to protect and preserve natural features

Over 80% of all landowners disagreed with the statement:

- 16. Landowners should not have to preserve natural areas because we have parks on public lands

Over 70% of all landowners agreed with the statement:

- 4. The earth is like a spaceship with only limited room and resources

Over 60% of all landowners disagreed with the statement:

- 10. Landowners have the right change the natural environment to suit their needs

Over 50% of all landowners agreed with the statement:

- 17. I am interested in practicing conservation on my own land if it does not interfere with resource use

Over 50% of all landowners disagreed with the statement:

- 1. Plants and animals exist mainly to be used by humans

Only involved landowners agreed with the statement:

- 6. We are approaching the maximum number of people the earth can support
- 18. I am interested in practicing conservation on my land even if it means sacrificing land and resource uses

The results suggested that landowners were generally quite positive towards the environment and conservation, although they had some attitudes that may work against private land conservation efforts. Responses suggested that most landowners recognized the need for nature conservation and for private land conservation specifically, and they supported further encouragement of both stewardship and preservation on private land (for frequency tables see Appendix 3).

Comparison of Survey Groups

There were some significant differences in the responses of the two landowner groups (see Table 11).

Table 11: Conservation Attitudes-Comparison of Landowner Groups

<i>Attitudes towards conservation</i>	<i>Statistic</i>	<i>Hants Landowners median (n=15)</i>	<i>Involved Landowners median (n=64)</i>
	<i>KW (df)</i>		
1. Plants and animals exist mainly to be used by humans	12.39 (1)	2	1
4. The earth is like a spaceship with only limited room and resources	5.55 (1)	4	5
7. I am concerned about the future of the natural environment in Nova Scotia	11.36 (1)	4	5
8. I think nature conservation is important	6.63 (1)	4	5
9. I think there are too many restrictions on private landowners due to environmental concerns	12.00 (1)	3	1
10. Landowners have a right to do what they want on their own land	4.18 (1)	2.5	2
11. Landowners have a responsibility to take care of their lands to protect nature	3.92 (1)	4	5
12. How we use our private land affects other people's land	5.27 (1)	4	5
15. Landowners should be encouraged to manage their resources in a sustainable way	9.22 (1)	4	5
16. Landowners should not have to preserve natural areas because we have parks on public lands	7.13 (1)	2	1
18. I am interested in practicing conservation on my own land even if it means giving up resource uses	17.06 (1)	3	5

All responses shown are significantly different between the two landowner groups ($p < 0.05$)

KW=Kruskall Wallace test (df)=degrees of freedom

(Measured on a scale of 1 to 5 with 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Although most respondents were favourable towards the environment and conservation, the involved landowners had much stronger responses for all questions

pertaining to environmental concern and support for conservation. They had almost twice the number of “strongly-agree” responses. Over 80% of involved landowners expressed an interest in preserving nature on their property, even if it involved sacrificing land and resource uses. Fifty-three percent strongly agreed.

Hants County landowners were not in favour of practicing preservation on their lands. Over 80% were interested, however, if they were allowed to continue certain land and resource practices. Their responses suggest that they were more concerned than involved landowners about restrictions on their use of land and resources, and valued landowner rights to do what they want with their land. Although the majority of Hants County landowners felt that private land conservation is an important complement to parks and nature reserves, there was a significant difference between the strength of their response and that of the involved landowner group. As would be expected, there was much higher variability in the responses of Hants County landowners, compared to the relatively homogeneous responses of the involved landowners.

There were additional concerns raised in some Hants County landowners’ comments, which have implications for private land conservation. Many were concerned about the forest industry and its impacts on the environment and on landowners. Another concern was related to perceived inequities and excessive restrictions imposed on landowners by environment and resource programs, and regulations.

Variables Related to Responses

There were several variables associated with conservation attitudes, in that they were related to one or more of the attitude statements in the questionnaire. These variables included: personal (socio-demographic) characteristics, characteristics of the land base, and involvement in nature-related activities (for specific relationship, see Table 52 to 55 in Appendix 4). These variables included: occupation, age, level of education, income, background (urban/rural), residence (permanent, seasonal or absentee), size of property owned, involvement in nature-related recreational activities, membership in conservation organizations, participation in conservation programs, involvement in conservation practices. Conservation/private land conservation knowledge was also related to conservation attitudes. The variables that related to environmental concern questions

specifically were: conservation knowledge, occupation, participation in conservation programs, expressed interest in participation in preservation-oriented private land conservation, and leaving natural areas on their property conservation purposes.

5.2.3 Knowledge Related to Private Land Conservation

Summary of Responses

In the second section of the questionnaire (landowner questionnaire page 2), I asked landowners to rate their level of knowledge on a number of items. In general, they perceived their level of knowledge on private land conservation practices, issues and options to be somewhat low, particularly their knowledge of government preservation-oriented options for landowners (see Table 12). For frequency tables see Table 44 and 45 in Appendix 3.

Table 12: Conservation Knowledge-Summary of Responses (n=79)

More than 50% of landowners did not consider themselves knowledgeable about the item:

6. Nature conservation options offered by the government

More than 50% of Hants landowners did not consider themselves knowledgeable about the items:

1. How to practice nature conservation on private land
 2. The 'science' of nature conservation
 3. Wetland conservation programs offered by Ducks Unlimited
 4. Nature conservation options offered by the private conservation groups
 5. Resource management options offered by the government
 7. Alternatives available for landowners interested in private land conservation
- Overall knowledge (combined score)

Over 50% of Involved landowners considered themselves knowledgeable about the items:

1. How to practice nature conservation on private land
2. The 'science' of nature conservation
4. Nature conservation options offered by private conservation groups
7. Alternatives available for landowners interested in private land conservation

Comparison of Groups

There were some important differences in responses between the two groups (see Table 13). Hants County landowners considered their knowledge related to private land conservation to be low for all questions. Over 70% rated their knowledge low to very low on private organizations, government preservation options, and alternatives for landowners. Involved landowners scored higher on the summed scale of conservation knowledge. They rated themselves as more knowledgeable about private groups, alternatives available, and nature conservation itself. At the same time, however, over 40% of them did not consider themselves knowledgeable in these areas.

Table 13: Conservation Knowledge-Comparison of Survey Groups

<i>Knowledge Related to Private Land Conservation</i>	<i>Statistic</i>	<i>Hunts Landowners median (n=64)</i>	<i>Involved Landowners median (n=15)</i>
4. Nature conservation options offered by the private conservation groups	18.67 (1)	2	4
6. Nature conservation options offered by the government	13.67 (1)	1	3
7. Alternatives available for landowners interested in private land conservation	19.56 (1)	2	4
8. Overall knowledge (combined score)	12.36 (1)	10.5	16

All responses shown are significantly different between landowner groups ($p < 0.05$)

KW=Kruskal Wallance Test (df)=degrees of freedom

(Measured on a scale of 1 to 5 with 1=very low 2=low 3=unsure 4=high 5=very high)

(Overall knowledge is a combined score out of 35)

Variables Related to Responses

There were several variables that appeared to relate with respondents' conservation knowledge. The variables related to one or more knowledge item on the questionnaire included: income, education, method of land acquisition (i.e. through family or through real estate market), involvement in nature-related activities, membership in conservation organizations, participation in natural resource/conservation programs and environmental concern (for specific relationships see Table 56 to 58 in Appendix 4).

5.2.4 Factors Encouraging Participation in Private Land Conservation

Summary of Responses

I asked all three survey groups to rate the importance of a list of factors in encouraging participation in private land conservation (landowners' questionnaire: page 3 and professionals' questionnaire: page 1). As indicated in Table 14, there were some factors that were important to most respondents in the three surveys. Other factors were important only to some groups (for frequency tables see Table 46 in Appendix 3).

Table 14: Factors Encouraging Participation-Summary of Responses (n=118)

<i>Factors considered by all groups to encourage participation</i>	<i>Factors considered by some groups to encourage participation</i>
<p>Over 80% of respondents agreed that these factors encourage participation:</p> <ul style="list-style-type: none">3. Concern about nature7. Protecting wildlife8. Protecting other values (e.g. streams, plants)13. Protecting natural beauty/scenery <p>Over 70% of respondents groups agreed that these factors encourage participation:</p> <ul style="list-style-type: none">1. Protecting land for children in the future9. Feeling of responsibility as landowner <p>Over 60% of respondents agreed that these factors encourage participation:</p> <ul style="list-style-type: none">15. Assurance of protection of land in the future <p>Over 50% of respondents agreed that these factors encourage participation:</p> <ul style="list-style-type: none">2. Family tradition12. Wildlife viewing opportunities17. Community awareness-building	<p>Hants and involved landowners agreed that these factors encourage participation:</p> <ul style="list-style-type: none">14. Protecting useful products16. Opportunity to learn about nature conservation <p>Hants landowners and professionals agreed that these factors encourage participation:</p> <ul style="list-style-type: none">6. Economic Security11. Providing non-consumptive recreation19. Whether friends or neighbours are involved <p>Only professionals agreed that these factors encourage participation:</p> <ul style="list-style-type: none">4. Financial incentives5. Other incentives

Factors encouraging participation in private land conservation which were recognized by all three survey groups included: a desire to protect natural values (including wildlife, other natural features and processes, and scenery), a sense of stewardship responsibility as a landowner, consideration of the future, and the importance of the land to family.

Comparison of Survey Groups

There were also some significant differences in responses between the three survey groups (see Table 15).

Table 15: Factors Encouraging Participation-Comparison of Survey Groups

<i>Factors Encouraging Participation</i>	<i>Statistic KW (df)</i>	<i>Inv.¹ med (n=15)</i>	<i>Hants² med (n=64)</i>	<i>Statistic KW (df)</i>	<i>Inv. med (n=15)</i>	<i>Prof.³ med (n=39)</i>	<i>Statistic KW (df)</i>	<i>Hants med (n=64)</i>	<i>Prof. med (n=39)</i>
2. Family tradition							5.74 (1)	5	4
3. Concern about nature	5.18 (1)	5	5	4.54 (1)	5	5			
4. Financial incentives				8.93 (1)	2	4	7.27 (1)	4	4
5. Other incentives				12.82 (1)	2	4	9.85 (1)	3	4
6. Economic security	9.26 (1)	2	4	4.99 (1)	2	4			
8. Protecting other conservation values (e.g. streams, plants)	3.75 (1)	5	5	8.68 (1)	5	4			
9. Feeling of responsibility	8.07 (1)	5	4						
10. Providing fishing/hunting	5.50 (1)	1	2	7.18 (1)	1	3			
13. Protecting natural beauty/scenery				6.59 (1)	5	4			
14. Protecting useful products				7.05 (1)	5	3.5	18.31 (1)	4	3.5
15. Assurance that land is protected in the future	5.46 (1)	5	4				4.40 (1)	4	4
16. Opportunity to learn about conservation				5.46 (1)	5	3			
17. Community awareness	5.00 (1)	5	4	4.76 (1)	5	4			

Responses shown are significantly different between survey groups ($p < 0.05$)

¹Inv.=Involved landowners ²Prof.=conservation professionals ³Hants=Hants landowners

KW=Kruskal Wallace test (df)=degrees of freedom

(Measured on a scale of 1 to 5 with 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

As indicated in the tables, both landowner groups considered the educational benefits of conservation and the practical benefits of resource protection to be important. The responses of involved landowners, however, showed a higher level of concern for nature conservation issues and stewardship, and were more homogeneous. The responses of Hants County landowners indicated that the same ecocentric, utilitarian, and stewardship values would encourage their participation in private land conservation. However, they rated the importance of these factors lower. Providing land for children in the future, maintaining family tradition, economic security and financial incentives were rated as

important to more Hants County landowners than involved landowners. They were also more concerned about recreational opportunities and whether friends, neighbours or relatives are involved in private land conservation. Some were interested in learning about nature conservation, but they did not consider increasing community awareness to be as important as involved landowners did.

There were also some differences in responses between the landowner groups and the professionals. Conservation professionals agreed with the need for both financial and non-financial incentives. Within the survey of professionals, there were some differences between sub-groups of respondents (see Table 78 in Appendix 5). The responses of preservation-oriented professionals indicated significantly stronger support for financial incentives than the responses of resource conservation-oriented professionals.

Variables Related to Responses

There were several variables that appeared to relate to one or more responses on factors encouraging participation in private land conservation. These variables included: occupation, education, income, background, method of land acquisition, percentage of natural area on the property, length of time of ownership of land and size of the property. Other related variables included involvement in nature-related recreational activities, membership in conservation organizations, expressed interest in participating in preservation-oriented efforts, and involvement in conservation practices (for specific relationships see Table 60 to 62 in Appendix 4).

5.2.5 Disincentives to Private Land Conservation

Summary of Responses

I asked respondents to rate the importance of certain factors in discouraging participation in private land conservation (landowners' questionnaire: page 4 and professionals' questionnaire: page 2). There was a low level of agreement between respondents regarding disincentives to private land conservation (see Table 16 below, and Table 47 in Appendix 3). A lack of trust of government was the only commonly agreed upon disincentive. It was recognized as a disincentive by over 50% of all respondents.

Table 16: Disincentives to Private Land Conservation-Summary of Responses (n=118)

<i>Some groups agreed that these factors act as disincentives</i>	<i>Professionals agreed that these factors act as disincentives</i>
Over 50% of respondents agreed that a disincentive is: 5. Lack of trust of government	Over 80% agreed that disincentives are: 19. Lack knowledge on options 25. Lack of educational incentives
Over 50% of respondents <u>disagreed</u> that a disincentive is: 8. Fear costs to landowner versus benefits for others	Over 70% agreed that disincentives are: 18. Lack of knowledge on values 21. Lack recognition of land value 23. Lack of financial incentives
Only Hants landowners agreed that a disincentive is: 6. Not having thought about conservation before 16. Fear of liability	Over 50% agreed that disincentives are: 20. Lack of conservation ethic 24. Lack of social incentives
Hants landowners and professionals agreed that disincentives are : 1. Need to make money 2. Belief in landowner rights 3. Desire for independence 10. Concern about restricting uses	
Professionals only agreed that disincentives are: 12. Lack of trust that programs will protect land in the future 14. Lack of landowner consultation 15. Tax penalties for donating/selling land 11. Concern about time frame of conservation agreement 13. Competing incentives for land/resources	

Comparison of Groups

There were some significant differences between survey groups (see Table 17).

Table 17: Disincentives to Private Land Conservation-Comparison of Survey Groups

<i>Factors Encouraging Participation</i>	<i>Statistic: KW (df)</i>	<i>Inv.¹ med (n=15)</i>	<i>Hants³ med (n=64)</i>	<i>Statistic: KW (df)</i>	<i>Inv.¹ med (n=15)</i>	<i>Prof.² med (n=19)</i>	<i>Statistic: KW (df)</i>	<i>Hants³ med (n=64)</i>	<i>Prof.² med (n=39)</i>
1. Need to make money	3.96 (1)	2	4	14.54 (1)	2	4	18.25 (1)	4	4
2. Belief in landowner rights	4.45 (1)	2.5	4	12.24 (1)	2.5	5	6.88 (1)	4	5
3. Desire for independence	7.54 (1)	3	4	12.03 (1)	3	5	4.13 (1)	4	5
4. Other priorities				6.42	2	3	5.94 (1)	3	3
5. Lack of trust of government									
7. Fear of cost vs. benefits				9.74 (1)	2	3	5.18 (1)	2	3
8. Difficulty getting family to agree to conservation				14.58 (1)	2	4	22.79 (1)	2	4
9. Concern about restricting use	5.08 (1)	2	4	9.93 (1)	2	4			
10. Concern about time frame				15.05 (1)	3	4			
11. Lack trust of programs	7.41 (1)	3	4						
12. Competing incentives for land				12.31 (1)	1.5	4	23.14 (1)		
13. Lack of consultation				6.61 (1)	3	4			

Responses shown are significantly different between survey groups ($p < 0.05$)

¹Inv.=Involved landowners ²Prof.=conservation professionals ³Hants=Hants landowners

KW=Kruskal Wallance test (df)=degrees of freedom

(Measured on a scale of 1 to 5 with 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

The responses of Hants County landowners again suggested that they were more concerned about economic issues than involved landowners. Many Hants County landowners expressed concern about having to make a living from their land, and the barrier this poses for their involvement in private land conservation. On the other hand, 73% of involved landowners do not consider this an issue. Hants County landowners were also concerned about ownership issues, including landowner rights, fear of restricting land and resource uses, and a desire for independence in how they manage their land. Their responses suggest that they were more concerned than involved landowners about liability and trespass issues, and the time frame of conservation agreements.

Although both landowner groups expressed ambivalent responses about a lack of landowner consultation being a disincentive to their participation, they agreed with

recommendations for such consultation to enhance private land conservation. Several landowners from both survey groups made comments relating to past efforts to become involved in conservation efforts that failed as a result of one of several issues not included in this survey. These issues included: a lack of interest by the groups or agencies they approached, lack of a program at the appropriate level of commitment, lack of financial assistance to carry out a proposed conservation plan, or lack of available information.

Over 50% of conservation professionals agreed that another disincentive was a lack of trust in programs to protect land in the future. They indicated, through comments, that landowners had expressed this concern to them in the past, with a particular fear of government selling off the land at a future time. Professionals, particularly those from non-government organizations, agreed that tax penalties for donating or selling land or land rights for conservation purposes pose a serious disincentive for private land conservation (see Table 79 in Appendix 5). Non-government organizations were more likely to recognize tax penalties for landowners donating or selling land as a disincentive. Preservation-oriented professionals were more likely to consider a lack of the following as a disincentive: a conservation ethic, recognition of value of the land and provision of all types of incentives. Government employees perceived that landowners have other priorities and a general lack of knowledge on the values of conservation.

As illustrated in Table 16, conservation professionals were asked about several other potential disincentives. The most important disincentives were: lack of landowner knowledge about conservation values and private land conservation options for landowners; lack of information and advice available; and lack of incentives (financial, social and educational).

Variables Related to Responses

Variables that were related to responses providing perceptions of disincentives included: income, education, occupation, percentage of natural area on the property, length of time of land ownership, size of property, residence, method of acquisition of the land, and economic importance of the land to the landowner. Environmental concern, involvement in nature-related recreational activities, conservation programs and

membership with conservation organizations also related to some perceptions of disincentives (see Table 63 to 65 in Appendix 4).

5.2.6 Challenges Facing Private Land Conservation Efforts

In the survey of conservation professionals, I asked respondents to rate the importance of several items in limiting or discouraging private land conservation efforts (professionals' questionnaire: page 4). Their responses are summarized in Table 18 (see also Table 49 in Appendix 3).

Table 18: Challenges to Conservation Efforts-Summary of Responses (n=39)

Over 80% of professionals agreed that these are challenges to private land conservation efforts:

- 2. Lack of communication with private landowners
- 5. Lack of coordination of efforts between government and non-governmental and community groups

Over 70% of professionals agreed these are challenges to private land conservation efforts:

- 6. Lack of commitment to private land conservation from groups and agencies

Over 60% of professionals agreed these are challenges to private land conservation efforts:

- 1. Lack of scientific data and information
- 4. Lack of inter-department/agency coordination
- 8. Lack of permanency of private land conservation programs/efforts
- 12. Lack of legal and policy support for private land conservation

Over 50% of professionals agreed these are challenges to private land conservation efforts:

- 3. Varied goals of different organizations for private land and resources
- 7. Lack of skill and experience among personnel of agencies and groups
- 9. Property tax implications for non-governmental groups
- 14. Lack of adequate knowledge about options for private land conservation by conservation personnel

The majority of conservation professionals agreed that the following factors were the most significant challenges to private land conservation efforts: communication; commitment, permanence and coordination among groups and agencies; skill and knowledge among the staff of conservation groups and agencies; legal and policy support for such efforts; and information on private land conservation needs, priorities, tools and strategies.

Comparison of Groups

There were some significant differences between the responses of sub-groups of professionals. The respondents from preservation-oriented and non-governmental groups agreed particularly strongly that there was a lack of legal and policy support for private land conservation. They also agreed that property tax implications for groups pose a challenge. Preservation-oriented professionals agreed that a lack of skill and experience

among personnel was another important challenge (for specific relationships see Table 80 in Appendix 5).

5.2.7 Respondents' Recommendations for Enhancing Private Land Conservation

I asked respondents from all three survey groups for their recommendations to enhance private land conservation in Nova Scotia (both questionnaires pages 5 and 6). Specifically, I asked them to rate the importance of certain factors for ensuring successful private land conservation. Their responses are summarized below (see Table 19 and Table 51 in Appendix 3). Recommendations with which most respondents agreed related to a need for the following: a variety of incentives, particularly tax breaks; increased educational efforts; accessibility for landowners; appropriate infrastructure and tools; and effective approaches to private land conservation.

Comparison of Survey Groups

There were several important differences in responses between the survey groups (see Table 20). For many of the recommendations agreed upon by all survey groups, the involved landowners' level of agreement was strongest. Involved landowners were the only group to agree with recommendations for a variety of conservation organizations to meet different landowner needs and interests.

Table 19: Recommendations-Summary of Responses (n=118)

<i>All groups agreed with these recommendations</i>	<i>Some groups Agreed with these recommendations</i>
<p>Over 80% of respondents agreed with:</p> <ul style="list-style-type: none"> 1a. Providing information on the values of conservation 1b. Providing information on the benefits of private land conservation 1c. Providing information on the areas of importance to conservation on their property 1d. Providing information on how to manage land for conservation 1e. Providing information on options available for landowners 2c. Providing property tax breaks 2d. Income tax breaks 3a. Providing a landowner contact program 3b. Providing a variety of conservation options 3e. Ensuring an easy and uncomplicated process for landowner involvement 3f. Providing knowledgeable advisors 3g. Providing information format allowing independence 3i. Providing a variety of approaches to providing information <p>Over 70% of respondents agreed with:</p> <ul style="list-style-type: none"> 3d. Consulting with landowners in designing programs, options, and incentives 32h. Providing incentives that fit the level of commitment involved <p>Over 60% of respondents agreed with:</p> <ul style="list-style-type: none"> 3h. Coordinating the efforts of various conservation organizations and agencies 3j. Ensuring a strong commitment to private land conservation from conservation organizations and agencies 2b. Providing small grants to landowners <p>Over 50% of respondents agreed with:</p> <ul style="list-style-type: none"> 2g. Providing conservation awards and public recognition to landowners who participate 3l. Ensuring other support for private land conservation (legal, economic, social, political) 3m. Providing flexibility in the length of time involved in a conservation agreement 	<p>Hants landowners and professionals agreed with:</p> <ul style="list-style-type: none"> 2a. Providing cash incentives to encourage landowners to become involved 2f. Providing cost sharing with landowners for management assistance <p>Only involved landowners agreed with:</p> <ul style="list-style-type: none"> 3c. Providing a variety of conservation organizations to meet different landowner needs/interests <p>All groups were unsure about:</p> <ul style="list-style-type: none"> 2e. Providing large grants to landowners to cover land management costs <p>Questions asked only of Professionals</p> <p>Over 80% agreed with:</p> <ul style="list-style-type: none"> 3p. Revise tax laws 3o. Increase and improve communication 3n. Develop innovative approaches to private land conservation (integrated/cooperative) 3q. Provide more training and education of private land conservation staff <p>Over 50% agreed with:</p> <ul style="list-style-type: none"> 3k. Providing government grants for non-governmental organizations

Table 20: Recommendations-Comparison of Survey Groups

<i>Factors Encouraging Participation</i>	<i>Statistic KW (df)</i>	<i>Inv.¹ land (n=13)</i>	<i>Hants.³ land (n=64)</i>	<i>Statistic KW (df)</i>	<i>Hants.³ land (n=64)</i>	<i>Prof.² land (n=19)</i>
1a. Providing information on the values of conservation						
1b. Providing information on the benefits of conservation	6.40 (1)	5	4	3.90 (1)	4	5
1c. Providing information on specific areas/features of value to conservation	5.08 (1)	5	4	16.60 (1)	4	5
1d. Providing information on how to manage land for conservation						
1e. Providing information on options available for landowners	9.09 (1)	5	4	25.29	4	5
2b. Providing small grants to landowners				4.14 (1)	4	4
2c. Providing property tax breaks	7.72 (1)	5	4	11.73 (1)	4	54
2d. Providing income tax breaks				11.67 (1)	4	5
2g. Providing awards and recognition of participation				8.06 (1)	4	4
3a. Providing a landowner contact program				15.30 (1)	4	5
3b. Providing a variety of conservation options	4.31 (1)			15.24 (1)	4	5
3c. Providing a variety of organizational options	5.64 (1)			5.69 (1)	3	4
3d. Consulting with landowners				17.41 (1)	4	5
3e. Ensuring an easy and uncomplicated process for landowner involvement	6.96 (1)	5	4	5.98 (1)	4	5
3f. Providing knowledgeable advisors				5.93 (1)	4	5
3h. Coordinating various conservation efforts	4.81 (1)	5	4			
3i. Providing a variety of information approaches	6.40 (1)	4.5	4	4.75 (1)	4	4
3j. Ensuring a strong commitment from organizations/agencies	13.44 (1)	5	4	10.72 (1)	4	5
3l. Ensuring other support for private land conservation	4.31 (1)	4.5	4	8.37 (1)	4	5

Responses shown are significantly different between survey groups ($p < 0.05$)

¹Inv.=Involved landowners ²Prof.=conservation professionals ³Hants=Hants landowners

KW=Kruskal Wallance test (df)=degrees of freedom

(Measured on a scale of 1 to 5 with 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Non-government groups agreed particularly strongly with recommendations for cash incentives, and property tax breaks for landowners (see Table 81 in Appendix 5). Non-

government and preservation-oriented groups were also both particularly supportive of government grants for non-government groups.

Variables Related to Responses

The variables that related with one or more landowners' recommendations for enhancing private land conservation included the following: level of education, background, occupation, income, percent of natural area on the property, economic importance of the land to the landowner, residence, years of ownership of the property, and involvement in nature-related recreation activities and nature conservation practices, membership in conservation organizations and involvement in natural resource/conservation programs, environmental concern, and expressed interest in participating in stewardship or nature preservation (for specific relationships see Table 67 to 68 in Appendix 4).

5.2.7.1 Preferences for Conservation Agreements

Summary of Responses

I asked both landowner groups, "If you were to enter into a conservation agreement, what time period would you prefer?" (landowners' questionnaire page 6). Their responses are summarized in Table 21 (and see Table 48 in Appendix 3).

Table 21: Preferences for Agreement Time Frame-Summary of Responses (n=79)

<i>Preference for Agreement</i>	<i>Hants Landowners (%) (n=64)</i>	<i>Involved Landowners (%) (n=15)</i>
no interest	27	0
less than 10 years	36	7
10-25 years	17	27
permanent	14	53

Comparison of Landowner Groups

Hants County landowners were more likely to have no interest in an agreement at all, or an interest in a short-term agreement, whereas involved landowners preferred a long-term or permanent conservation agreement (see Table 22). Only three of the involved landowners were currently committed to a conservation agreement, and all three were permanent agreements. Others had donated land for conservation purposes, or were in the process of exploring the potential involvement in a conservation agreement.

Table 22: Preferences for Agreement Time Frame-Comparison of Landowner Groups

<i>Preference</i>	<i>Statistic</i>	<i>Hants landowners median (n=64)</i>	<i>Involved landowners median (n=15)</i>
Preference for Agreement Time frame	KW (df) 15.63 (1)	2	4

Responses shown are significantly different between survey groups ($p < 0.05$)

1=no interest 2=less than 10 years 3=10-25 years 4=permanent

KW=Kruskal Wallance Test (df)=degrees of freedom

Related Variables

The variables that related to landowners' preferences for agreement time-frames included: level of education, background, income and involvement in conservation programs (see Table 66 to 68 in Appendix 4).

5.2.8 Preferences for Institutional Arrangements

I asked all respondents to indicate their preference for institutional options for each of the following roles in private land conservation: providing programs, providing funding, managing the land, and holding conservation agreements (both questionnaires page 7). A summary of their responses is provided in Table 23.

Table 23: Preferences for Institutional Options-Summary of Responses

<i>Institutional Arrangements</i>	<i>Hands landowners (%) (n=64)</i>		<i>Involved landowners (%) (n=13)</i>		<i>Professionals (%) (n=39)</i>	
Providing programs	coalition	41	provincial government	80	private organizations	90
	landowners	38	private organizations	80	local groups	80
	provincial government	38	coalition	76	provincial government	72
	private organizations	28	local community groups	60	coalition	54
	federal government	19	federal government	53	federal government	49
	local community groups	14	landowners	33	municipal government	46
	municipal government	13	municipal government	27	landowners	39
Providing funding	provincial government	45	provincial government	73	provincial government	67
	federal government	38	private organizations	60	private organizations	67
	landowners	28	coalition	60	federal government	56
	coalition	27	federal government	47	coalition	56
	private organizations	27	local community groups	40	local community groups	49
	municipal government	19	landowners	40	municipal government	46
	local community groups	8	municipal government	13	landowners	39
Managing private lands	landowners	80	private organizations	67	landowners	67
	coalition	20	coalition	67	coalition	67
	provincial government	13	provincial government	53	local community groups	62
	private organizations	9	local community groups	40	private organizations	54
	federal government	6	landowners	33	provincial government	46
	local community groups	5	federal government	20	federal government	33
	municipal government	3	municipal government	20	municipal government	33
Holding agreements	provincial government	38	provincial government	73	private organizations	74
	landowners	22	private organizations	67	provincial government	69
	private organizations	19	coalition	53	local community groups	62
	federal government	17	local community groups	53	federal government	46
	coalition	14	federal government	20	municipal government	41
	local community groups	9	landowners	13	coalition	36
	municipal government	8	municipal government	13	landowners	21

There was a wide range of preferences for institutional arrangements amongst the respondents. There was some support for all levels of government involvement in private land conservation, as well as involvement by private organizations, local community groups

and private landowners themselves. There was also support for a coalition of all these interests.

Comparison of Groups

There were some significant differences in preferences of the various survey groups (see Table 24). Professionals and involved landowners were more likely to agree with several options for who should be involved in the various aspects of private land conservation. The Hants County landowners, on the other hand, were more likely to indicate a few preferences. Since these preferences varied between respondents, the overall percentage of landowners supporting any one option was small.

Hants County landowners consistently agreed that landowners themselves should be involved in all aspects of private land conservation efforts. The involved landowners and professionals, however, did not agree with such a central role for private landowners. Involved landowners ranked private landowners particularly low in management of land.

There were a few significant differences between sub-groups of professionals (see Table 82 Appendix 5). Most important, preservation-oriented respondents preferred private organizations for running private land conservation programs, whereas government employees and resource-oriented respondents preferred the provincial government.

Variables Related to Responses

Several variables were related to one or more preferences for institutional arrangements. Variables related to personal and land characteristics included: level of background, age, occupation, economic importance of the land to the landowner, size of property, residence, years of ownership, and method of acquisition of the land. Other variables related to one or more preferences included: involvement in nature-related recreation activities, nature conservation practices, membership in conservation organizations, involvement in natural resource/ conservation programs, environmental concern, and knowledge about private land conservation (for specific relationships see Table 69 to 70 in Appendix 4).

Table 24: Preferences for Institutional Options-Comparison of Survey Groups

<i>Institutional Options</i>	<i>Statistic</i> KW (df)	<i>Inv.¹</i> med (n=15)	<i>Hants²</i> med (n=6)	<i>Statistic</i> KW (df)	<i>Inv.¹</i> med (n=15)	<i>Prof.³</i> med (n=19)	<i>Statistic</i> KW (df)	<i>Hants²</i> med (n=6)	<i>Prof.³</i> med (n=19)
Providing program									
federal government	7.04 (1)	2	1				12.31 (1)	1	1
provincial government	7.62 (1)	2	1				13.83 (1)	1	2
local municipality							17.43 (1)	1	1
private organizations	13.19 (1)	2	1				24.36 (1)	1	2
local community groups	13.95 (1)	2	1				40.03 (1)	1	2
coalition	4.77 (1)	2	1	5.45 (1)	2	2	21.76 (1)	1	2
Providing funding									
federal government									
provincial government									
municipal government				5.30 (1)	1	1	7.90 (1)	1	1
private organizations	5.10 (1)	2	1				14.69 (1)	1	2
local community groups	9.39 (1)	1	1				21.40 (1)	1	1.5
coalition	5.10 (1)	2	1				8.13 (1)	1	2
private landowners									
Managing the land									
federal									
provincial government	11.44 (1)	2	1				9.38 (1)	1	1
municipal government	5.48 (1)	1	1				9.51 (1)	1	1
private organizations	23.40 (1)	2	1				13.85 (1)	1	1
local community groups	14.19 (1)	2	1				35.38 (1)	1	2
coalition	11.74 (1)	2	1				42.25 (1)	1	2
landowners	15.69 (1)	1	2						
Holding agreements									
federal government				3.93 (1)	1	1.5	9.69 (1)	1	1.5
provincial government	4.40 (1)	2	1				9.16 (1)	1	2
municipal government				4.49 (1)	1	1	15.69 (1)	1	1
private organizations	11.32 (1)	2	1				31.01 (1)	1	2
local community groups	13.58 (1)	2	1				31.22 (1)	1	2
coalition	9.02 (1)	2	1				6.08 (1)	1	1
private owners									

Responses shown are significantly different between survey groups (p<0.05)

¹Inv.=Involved landowners ²Prof.=conservation professionals ³Hants=Hants landowners

KW=Kruskall Wallace test (df)=degrees of freedom

(Measured on a 2 point scale with 1=disagree 2=agree)

5.2.9 Preferences for Private Land Conservation Tools

Summary of Responses

I asked respondents to rate their level of preference for various tools for private land conservation (both questionnaires: page 8). A summary of their responses is provided in Table 25 (see Table 50 in Appendix 3).

Table 25: Preferences for Conservation Tools-Summary of Responses (n=118)

<i>Most respondents preferred these tools</i>	<i>Some groups preferred these tools</i>
Over 70% of all respondents preferred: 1. Landowner contact programs	Only Hants landowners and professionals preferred: Management agreements
Over 50% of all respondents preferred: 3. Written agreements 6. Conservation easements 11. Rights of first refusal agreements	Only Involved landowners and professionals preferred: 5. Leases 7. Selling land (or interest in land) to a conservation group 9. Donating land (or interests in land) to a conservation group 10. Donating land (or interests in land) to government 12. Donating land (or interests in land) in will 13. Land use zoning Only professionals preferred: 8. Selling land (or interests in land) to government All groups were unsure about: 2. Handshake/verbal agreements

The most widely accepted and preferred tool for private land conservation was landowner contact, with over seventy percent of all respondents agreeing with this option. Other options accepted by the majority of respondents were: written agreements, easements, and rights of first refusal agreements. Most respondents were unsure about handshake agreements, and were against selling land to the government for conservation.

Comparison of Groups

There were some differences in preferences for conservation tools between the different survey groups (see Table 26).

Table 26: Preferences for Conservation Tools-Comparison of Groups

Factors Encouraging Participation	Statistic: KW (df)	Inv. ¹ med (n=13)	Hants. ³ med (n=64)	Statistic: KW (df)	Inv. ¹ med (n=13)	Prof. ² med (n=17)	Statistic: KW (df)	Hants. ³ med (n=64)	Prof. ² med (n=17)
1. Landowner contact programs	6.54 (1)	5	4				10.01 (1)	4	5
3. Written agreements	3.77 (1)	4	4				10.96 (1)	4	4
4. Management agreements				6.67 (1)	3	4	17.01 (1)	4	4
5. Leases							16.70 (1)	3	4
6. Conservation easements	10.37 (1)	4	4	4.91 (1)	4	5	42.13 (1)	4	5
7. Selling land to a conservation group	13.24 (1)	4	2				23.99 (1)	2	5
8. Selling land to government	6.66 (1)	3	2				19.50 (1)	2	4
9. Donation to conservation group	14.79 (1)	5	3				44.52 (1)	3	5
10. Donation to government	9.76 (1)	4	2				32.44 (1)	2	5
11. Rights of first refusal agreements	10.86 (1)	4	4				14.76 (1)	4	4
12. Donating land in a will	19.28 (1)	5	3				55.07 (1)	3	5
13. Land use zoning	11.38 (1)	4	2				40.08 (1)	2	5

Responses shown are significantly different between survey groups (p<0.05)

¹Inv.=Involved landowners ²Prof.=conservation professionals ³Hants=Hants landowners

KW=Kruskall Wallace test (df)=degrees of freedom

(Measured on a scale of 1 to 5 with 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Support for all conservation tools was significantly higher for involved landowners and conservation professionals, particularly for landowner contact and conservation easements. Eighty-nine percent of professionals and 80% of involved landowners recommended conservation easements. Eighty-seven percent of conservation professionals and over 90% of involved landowners recommended landowner contact. Within the Hants landowner survey, those respondents who were particularly supportive of landowner contact included low income landowners who were permanent residents on their property and those who rely on their land economically.

Flexibility in preferences for conservation options varied. Involved landowners and conservation professionals were more likely than Hants County landowners to accept a range of conservation options. Hants County landowners generally, and particularly those

landowners with lower incomes, lower education levels, and rural backgrounds, were less likely to accept a range of tools for private land conservation.

Some options were acceptable to only certain survey groups. Involved landowners and professionals supported stronger types of conservation options including some which are not voluntary and which take away landowner rights and controls. They supported leasing, selling land to a conservation group, donating land to a group or government agency, and donating land in a will. Eighty-two percent of professionals and 64% of involved landowners favoured zoning for conservation. Preservation-oriented professionals and those respondents who were not landowners themselves were particularly supportive. Professionals, particularly government employees, were the only group in favour of selling land to the government (see Table 81 in Appendix 5). Other conservation professionals and most landowners were opposed to this option.

Command and control approaches, such as zoning, which are based on increased legislation and restrictions were strongly opposed by many Hants County landowners. They preferred voluntary methods that maintain landowner control and ownership of the land.

Variables Related to Responses

The variables that related to one or more preferences for tools for private land conservation included: level of education, age, background, size of the property, economic importance of the land to the landowner, method of acquisition of the land, environmental concern, and expressed interest in participating in nature preservation (for specific relationships see 71 and 72 in Appendix 4).

5.3 Influences on Participation in Private Land Conservation

To determine potential influences on participation in private land conservation, I compared those landowners involved in private land conservation with those who were not involved. Since no landowners in the Hants County survey were officially involved in private land conservation, I compared the Hants County survey group with those in the survey group of landowners involved in private land conservation.

The profiles of each landowner group were discussed in section 5.2.1 (see Table 8). There were significant differences between these groups in terms of land and personal characteristics (see Table 27 and Table 28 below).

Table 27: Land Characteristics-Comparison of Landowner Groups

<i>Land Characteristics</i>	<i>Statistic</i> χ^2 (df)	<i>Hants landowners</i> <i>median</i> (n=64)	<i>Involved landowners</i> <i>median</i> (n=15)
Acquisition (1=obtained through the family 2=obtained outside of family)	7.56 (2)	1	2
Residence (1=permanent resident 2=non- permanent)	13.98 (2)	1	2

Responses shown are significantly different between survey groups ($p < 0.05$)

Table 28: Personal Characteristics-Comparison of Landowner Groups

<i>Personal Characteristics</i>	<i>Statistic</i> χ^2 (df)	<i>Hants</i> <i>landowners</i> <i>median</i> (n=64)	<i>Involved</i> <i>landowners</i> <i>median</i> (n=15)
Gender (1=male 2=female 3=male and female responded together)	7.31 (2)	1	1
Occupation (1=resource 2=other 3=professional)	10.26 (2)	2	3
Income (1=under 15,000 2=15-24,999 3=25-35,000 4=over 35,000)	7.41 (1)	3	4
Education (1=less than high school 2=high school 3=post secondary)	15.03 (1)	2	3
Background (1=rural 2=urban)	11.53 (1)	1	2

Responses shown are significantly different between survey groups ($p < 0.05$)

As indicated in Table 29 and Table 30, there were differences in the level of participation in nature-related activities and practices between the two landowner groups.

Table 29: Involvement in Nature-related Activities-Summary of Responses

<i>Involvement in Conservation</i>	<i>Hants landowners (%) (n=64)</i>	<i>Involved landowners (%) (n=15)</i>
Activities:		
Consumptive activities	9	0
Non-consumptive activities	32	80
Both activities	<u>32</u>	<u>13</u>
Total involved	<u>73</u>	<u>93</u>
Membership:		
Resource-oriented group	10	0
Preservation-oriented group	<u>7</u>	<u>80</u>
Total involved	<u>17</u>	<u>80</u>
Program Involvement:		
Resource-oriented program	20	6
Preservation-oriented program	<u>3</u>	<u>66</u>
Total involved	<u>23</u>	<u>82</u>
Practices:		
Sustainable resource use	46	33
Habitat improvement	26	33
Consideration of nature in how land and resources used	40	60
Leaving natural areas alone for conservation purposes	11	86

Table 30: Involvement in Nature-related Activities-Comparison of Groups

<i>Involvement in Nature-related Activities</i>	<i>Statistics</i>		<i>Hants landowners median (n=15)</i>	<i>Involved landowners median (n=64)</i>
	<i>χ^2</i>	<i>(df)</i>		
Involvement in nature-related activities (1=no 2=consumptive 3=non-consumptive)	12.23	(3)	2	3
Membership in a conservation groups (1=no 2=resource conservation-oriented 3=preservation-oriented)	37.04	(2)	1	3
Leave natural areas alone for conservation purposes (1=no 2=yes)	36.27	(1)	1	2
Involvement in a conservation program (1=no 2=resource conservation-oriented 3=preservation-oriented)	40.21	(2)	1	3

Responses shown are significantly different between survey groups ($p < 0.05$)

Comparison of the two landowner groups suggested that involved landowners were more likely to participate in nature-related activities than other landowners. Eighty percent were involved in non-consumptive recreation activities such as hiking, nature study or reading nature magazines. Many were members of preservation-oriented conservation groups. Involved landowners were more likely to be involved in nature-related land use practices including: habitat improvement, consideration of nature in land management, and

leaving natural areas alone for conservation purposes. Over 80% of involved landowners claimed to leave areas alone for conservation purposes. Overall, their land use practices were more likely to be preservation-oriented rather than resource-use oriented. Finally, involved landowners were more likely to be involved in a conservation program of some kind, particularly a preservation-oriented program such as a land trust or a project with a local environmental group.

Hants County landowners involved in conservation practices represent an important sub-group of landowners. Their responses indicated that they may not necessarily be interested in participating in private land conservation. Some of their responses about participation in conservation practices may have been misleading. Landowners involved in these practices tended to be larger landowners, who acquired their land through the real estate market. Since they were owners of larger properties, there is a greater likelihood that some areas have been left undeveloped. Many also follow the tradition of leaving a woodlot, more for practical and economic reasons than for conservation. They may practice habitat improvement more for the protection of game species than for nature preservation. They do, however, represent a potential market for stewardship type agreements, which can lead to more preservation-oriented involvement.

This chapter has highlighted other significant differences between the two landowner groups. Involved landowners showed greater concern about and support for the environment, conservation and private land conservation. They were more knowledgeable about nature conservation and their options for involvement in private land conservation. They were more motivated by ecocentric and stewardship factors than economic factors. They were more focused on landowner responsibilities than landowner rights. Involved landowners were more supportive of a range of private land conservation tools, including both voluntary tools and stronger tools such as zoning. They preferred long term or permanent agreements. They supported the involvement of a variety of conservation institutions. They made stronger recommendations for education, incentives, commitment from agencies and organizations, and support for private land conservation (i.e. legal, political, social).

Many Hants County landowners' responses suggested that they depend on their land economically, and at the same time, they had low levels of income. They were, therefore, necessarily more focused on the economic implications of private land conservation, and the potential impacts on their land and resource uses. They were not as interested in private land conservation, and were less familiar with the relevant issues.

5.4 Comparison of Responses Based on Survey Method

There was an unexpected variation in the responses when I compared those respondents who chose to complete the survey together with me in an interview, with those who elected to fill in the questionnaire on their own (see Table 76 and 77 in Appendix 4). Fifty-three percent of respondents chose to have an interview. They tended to be owners of large properties, who depended on their land economically, and who have lived on their property for over ten years. They had significantly lower incomes and education than those who were not interviewed. Most had rural background and resource-based occupations.

Respondents who selected interviews had significantly lower perceived knowledge related to private land conservation. They were also more “dominionistic” in their conservation attitudes in that they considered nature to exist for the benefit of humans. Their responses suggested that their need to make money would be a significant disincentive to their participation in private land conservation. Non-interviewed respondents showed more positive environmental concern, recognition of the importance of private land conservation and support for encouraging conservation and preservation efforts. Non-interviewed respondents were significantly more supportive of private land conservation agreements, and particularly longer term agreements.

The responses of those landowners who requested interviews suggested that they were less trusting of government than those of landowners who were not interviewed, and more in favour of private landowners maintaining management of their lands. Non-interviewed respondents favoured the federal and provincial government for land management and the provincial government for holding conservation agreements with landowners significantly more than interviewed respondents.

6. CHAPTER SIX: DISCUSSION

6.1 Introduction

My research identified some of the main issues influencing private land conservation in Nova Scotia, and potential actions to address them, from the perspectives of both landowners and conservation professionals. Hopefully, the results of this study provide important insights and build upon the existing literature. The findings are similar to some previous studies, but somewhat different from others. The study also provides empirical support for previously asserted recommendations for private land conservation in the Province, including the need for education, information-gathering, economic incentives, and legislative changes (e.g. Evans 1992; MacDonald 1990; Milton 1995b). Some specific findings contradict the recommendations of some of these reports that were not based on empirical study. The Wetland Stewardship Strategy for Nova Scotia (MacDonald 1990), for example, recommends verbal agreements and leases for a core stewardship program. My study did not support either of these options. Written agreements, which were one of the most supported options in my study, were not recommended as part of the core program. My study also provides empirical support for other issues discussed in the literature such as the importance of liability issues and a lack of trust of government.

This study was unique in that it was the only research on private land conservation carried out in Nova Scotia, and it provides a case study specific to this context. It was also unique in that I integrated all the variables identified as significant in other studies. I synthesized the responses to different questions, including the perspectives of all relevant interests, represented by my three survey groups, to develop overall recommendations for enhancing private land conservation efforts in the Province. The responses of my three survey groups were quite distinct, and were therefore useful in providing the necessary range of perspectives. This study also examined relationships between variables that earlier studies did not examine including: perceived landowner knowledge of private land conservation issues and options, landowner attitudes about and recommendations for private land conservation, and perceptions of factors encouraging and discouraging

landowner participation. It was also the first study to empirically examine the perceptions of conservation professionals related to private land conservation.

The following section provides a discussion of the study results in terms of the research sub-questions, and how the results relate to the literature. A summary of these findings is provided in Table 84 through Table 90 in Appendix 6. I then discuss the results in terms of the two main research questions:

- 1) What are the important issues influencing private land conservation in Nova Scotia?
- 2) What actions can be taken to address these main issues?

6.2 Discussion of Research Sub-questions

6.2.1 *Landowner Attitudes*

The literature suggests that landowner attitudes have an important influence on private land conservation (Brechtel et al. 1987; Cutting and Cocklin 1992; Haymond 1990; Hilts 1984). Landowner attitudes revealed in my study seem to support this suggestion. Most landowners demonstrated some degree of environmental concern and interest in nature conservation. Over 80% of all landowners agreed with statements indicating that they consider the environment and conservation to be important. These findings are consistent with many previous studies (Kreutzwiser and Pietraszko 1986, Morgan 1985; Moull 1987; Scenic Hudson 1986; Van Patter et al. 1990; Waddell 1990). Responses also indicated that landowners support and recognize the specific need for private land conservation efforts (attitudes that have not been studied previously).

There were some attitudes among the Hants County landowners, however, that may not work favourably for private land conservation. Comparison of the two landowner groups suggested that Hants County landowners, for example, were significantly more likely to agree with the statement that “Landowners should not have to preserve natural areas and special features on their lands because we have parks on public lands for nature preservation.” Hants County landowners had significantly more “dominionistic” and utilitarian attitudes towards nature. For example, they were more likely to agree with statements indicating that nature exists mainly for the benefit of humans and that humans have a right to change the natural environment to suit their needs. Their responses suggest that they were not as accepting of the non-utilitarian and more “ecocentric” and intrinsic values of nature, and less in agreement about the responsibility of landowners to look after their land to protect nature. Their responses also suggest less support for encouraging private land conservation efforts. Some of these findings were consistent with the findings of other studies. Cutting and Cocklin (1992), for example, suggest that there may be landowner attitudes that work against private land conservation, and Kellert (1981a) found that many rural landowners are limited to utilitarian values and dominionistic views. Maass (1992) also suggests that rural communities tend to be more utilitarian in attitudes to

nature than urban dwellers. However, no previous studies have examined attitudes related to private land conservation specifically.

Landowners who had participated in private land conservation and those who responded to a statement indicating their interest in participating, demonstrated a significantly higher degree of environmental concern than other landowners. Both the number of responses, and the strength of their responses to statements about the environment and conservation suggest their level of concern. Specifically, they were more likely to recognize the need for conservation and private land conservation, and to support private land conservation efforts.

More positive conservation attitudes among Hants County landowners were related to the following variables: involvement in conservation programs, nature-related recreational activities, and membership in conservation groups, and conservation knowledge. Some conservation attitudes were more negative in owners of large properties, who were permanent residents on their rural property and landowners with the following personal characteristics: lower levels of education and income; resource-oriented occupations; rural backgrounds and over 50 years old. No previous studies have compared conservation attitudes between participants and non-participants, or examined attitudes about private land conservation specifically. However, some of the relationships my study found between personal variables and conservation attitudes were consistent with the findings of other general conservation attitude studies. The Agency of Environmental Conservation (1982), for example, found that farmers were less appreciative of wetlands and less likely to favour their protection than non-farmers. They also found that college-educated owners were more appreciative and more likely to favour their protection than landowners with less education. Kellert (1981a) found that rural landowners of large properties were less likely to appreciate conservation for reasons other than dominionistic and utilitarian values. Studies have also found relationships between each of these personal, land and participation variables, and general environmental concern. As in previous studies, I found that occupation was related to environmental concern (Agency of Environmental Concern 1982; Kreutzwiser and Pietraszko 1986; Moull 1987; Van Liere and Dunlap 1980). However, some personal and land variables identified in previous

studies were not significantly related in my study (see Table 36, 37 and 38 in Appendix 2). Other variables related to environmental concern in my study included conservation knowledge, involvement in conservation practices, involvement in conservation programs, and expressed interest in participation in preservation-oriented efforts.

Fifty-four percent of conservation professionals, particularly those involved in preservation-oriented efforts, believed that landowners lack an adequate environmental ethic for the sake of private land conservation. Landowners in the study, however, indicated through their responses that they had a strong environmental ethic, as outlined above. This discrepancy may be due to differing perspectives of conservation. From landowner comments on the questionnaire and in the interviews, it seemed that some landowners had a resource-use based perspective of nature conservation and were not aware of preservation as an important component in nature conservation. Some landowners expressed concern that efforts such as Ducks Unlimited and the Department of Natural Resource's woodlot management program shape landowners' views of conservation into one that is too resource-use focused. Others made comments that some landowners equate nature conservation with sustainable forestry. Another indication of this differing perspective relates to the finding that 80% of Hants County landowners expressed interest in participating in private land conservation if it did not involve sacrificing current land and resource uses. This suggests strong support for "stewardship" efforts based on sustainable resource use. Unfortunately, however, there was less interest in participating in private land conservation focused on the preservation of nature. This discrepancy may be due to economic factors, a desire for independence and more control over land uses, and/or the desire to keep options open for future use by other family members. It may, however, also be due to a lack of a preservation ethic or understanding of the importance of preservation.

Although many landowners may want to do what is right for the environment, a primary concern seemed to be maintaining landowner rights. Thirty-nine percent of Hants County landowners (significantly more than involved landowners) agreed with the statement that "Landowners have a right to do what they want with their own land." Landowners with less education and lower incomes were particularly apt to agree with this

statement and the statement that “People have the right to change the natural environment to suit their needs.” Although no empirical studies have examined the impacts of perceptions of landowner rights on private land conservation, the literature does suggest that conservation professionals are encountering this concern, particularly in the United States (Beatley 1994; Cox 1995; Cutting and Cocklin 1992; Evans 1992; Filyk 1992; Hamilton and Baxter 1977; Large 1973; and Samdahl and Robertson 1989). Part of this attachment to landowner rights in Nova Scotia may relate to family history on the land, which has created a strong attachment to the land and a strong sense of ownership..

Results also indicated that 28% of Hants County landowners (significantly more than involved landowners), believed that there are too many restrictions on private landowners due to environmental concerns. Seventy-one percent of Hants County landowners agreed that they fear restrictions on their land use and management, and felt that these restrictions limited their involvement in private land conservation.

Landowner comments provided some potential insight into this concern about restrictions. Some comments suggested that landowners were concerned about the economic burden that these restrictions place on rural landowners, particularly farmers. They were also concerned about how far such restrictions might go. There were some comments which suggested that landowners lump together all programs, policies and regulations related to the environment or natural resources, and there were varied perceptions and even mis-perceptions about the implications of existing regulations for rural landowners. Landowner interest in private land conservation may be affected by their understanding of, and support for, these various other efforts. Respondents’ comments also suggested that they perceive inconsistencies between the strong environmental regulations placed on landowners, who are most economically disadvantaged, and the lenient treatment of industry. Some landowners expressed concern that it is big industry that causes much more substantial damage, particularly the forest industry. They resented this inequity, particularly at a time when they perceive that environmental regulations on private land owners are increasing. Some landowners commented that large companies should pay for their environmental impacts, and that they should pay for private land conservation as compensation. Landowner concerns about

restrictions on their land resulting from involvement in private land conservation have been identified in the literature (Beatley 1994).

Through comments on the questionnaire and through the interviews, some landowners also expressed concerns about the forest industry and related government policies, in terms of their impacts on the environment and on private landowners. Comments echoed concerns in the literature related to the industry domination over the life, politics and economies of many resource towns, and the resulting dependent development and control of prices and markets (Sandberg 1992). The industry, according to these comments, shows little interest in sustainable practices. Funding tends to be production oriented, to support an economic-based political agenda. Some landowners expressed concern that the government is too supportive of mechanization and large-scale operations, through policy, subsidies, and low stumpage fees. These factors work together to keep wood prices extremely low and production high. The literature indicates that forest practices and policies, and the resulting low wood prices may penalize small woodlot owners. They make it difficult for small woodlot owners to compete with large industries, particularly if the landowners are interested in sustainable resource use (Sandberg 1992). As a result, many landowners have been tempted to clearcut their lands, to sell out to these forestry companies, or to accept financial incentives in exchange for logging rights on their land (Land Resource Group 1990). Other landowners may want to hold onto their lands to keep future economic options open. Again, both respondents' comments and the literature suggest that landowners may be resistant to participate in any endeavour with their land, particularly if the government is involved (Land Resource Group 1990).

Some landowners also made comments indicating that large forest companies are destroying the local resource and environment for short term profit, and that local people are not getting the benefit of employment or local economic stimulation. They opposed the amount of clear-cutting that is being done, but felt powerless to do anything about it. Some landowners also feared that, as forest companies use up their lands and the crown lands under timber agreements, leases and licenses, there will be increasing pressures on privately owned land. Some feared that government and industry together will control private wood owners and force them into inappropriate actions. Finally, some landowners

complained that current government approaches to forestry, including their woodlot management program, focus too much on production and not on sustainability and conservation.

Some landowners' comments indicated resentment of the role of the Province in land deals and support of forestry giants. The literature suggests that this role has instilled suspicion and distrust towards the Department of Natural Resources, and the provincial government generally (Land Resource Group 1990). Its role in such deals has also led some landowners to jealously protect their private property and selling rights (Land Resource Group 1990; Sandberg 1992). This attitude may also inhibit interest in conservation on their lands.

6.2.2 Landowner Knowledge

My study revealed that perceived landowner knowledge about conservation, and specifically private land conservation, is limited. Landowners who were involved in private land conservation, and those who expressed interest in participating, were more aware of private land conservation issues, options and organizations than other landowners. However, there were areas where even these landowners were lacking in knowledge, particularly concerning government preservation-oriented efforts. Less than half of the involved landowners rated their level of knowledge high to very high for government resource programs and government preservation programs. Only 54% rate their knowledge on how to practice conservation, private conservation groups, and alternatives available for landowners as high to very high. Although these ratings were higher than those of Hants County landowners, they still indicate that some landowners are not aware of their private land conservation options.

Less than half of the Hants County landowners considered themselves knowledgeable about how to practice conservation or the science of conservation. Over 70% did not consider themselves knowledgeable about institutional options and alternatives available (e.g. agreements etc.) for landowners interested in private land conservation. Some comments from Hants County landowners, however, emphasized the amount of knowledge held by many landowners who have lived sustainably on the land for generations. They emphasized the need to integrate this knowledge into private land conservation efforts.

Existing studies have reported conflicting results about the level of landowner knowledge related to the environment and conservation, likely because of the different ways in which knowledge was measured and defined. Some researchers found that knowledge about the environment and conservation, and about the value of land for conservation purposes was limited (Arcury et al. 1986; Brusnyk et al. 1990; Kellert 1981; Kreutzwiser and Pietraszko 1986; Smutko 1986). Hilts (1989a, 1993a), on the other hand, found that landowners were quite knowledgeable about conservation issues and values.

No studies have examined the influence of knowledge specifically about private land conservation and private land conservation options on participation. My results indicated a significant difference in the perceived private land conservation knowledge of involved

landowners and those landowners not involved in private land conservation. A higher level of perceived knowledge on specific items was also related to higher levels of income and education, land acquisition through the market (not family), as well as involvement in nature-related activities, membership in conservation organizations, participation in natural resource/conservation programs, and environmental concern. The only research that examined relationships between conservation knowledge, and personal and land variables, was a study pertaining to knowledge about specific forestry/resource programs available in Nova Scotia (forest management). That study (Wellstead and Brown 1993) found that knowledge was higher for landowners of large properties and lower for less educated or retired landowners. My results support the claim that landowner knowledge about the environment is related to attitudes (Arcury et al. 1986). My results also seem to support the suggestion in the literature that landowner conservation knowledge may be an important variable influencing participation in private land conservation (Arcury et al. 1986; Gobster and Dickhut 1988; Lichtenberg and Lessley 1992; Smutko 1986).

6.2.3 Factors Encouraging Participation in Private Land Conservation

The study results suggested that there were several important factors encouraging participation in private land conservation. Over 80% of respondents from all survey groups agreed that landowners are encouraged to participate in private land conservation by their concern about nature and a desire to protect it. Over 70% felt that landowners' feeling of responsibility to protect the land, and concerns about protecting land for their heirs were also important encouraging factors. Over 50% felt that other important encouraging factors were family tradition, wildlife viewing opportunities, assurance that land is protected for the future, and the educational benefits of private land conservation.

Involved landowners were more motivated by "ecocentric" and stewardship-related factors, as indicated by the strength of their responses. Hants County landowners felt more strongly than involved landowners about economic security, economic incentives, and providing hunting and fishing opportunities. Ninety-four percent expressed a desire to protect land for their children, while only 73% of involved landowners did, and 82% expressed concern about maintaining family heritage, compared to 42% of involved landowners. Hants County landowners also rated concern about maintaining family heritage significantly higher than conservation professionals did. Both landowner groups also felt that protecting useful products, and an opportunity to learn about conservation were motivating factors. Additional factors that over 50% of conservation professionals and Hants County landowners considered important including to providing non-consumptive recreation opportunities, and whether friends or neighbours were involved.

The only empirical study that has explored factors perceived to encourage participation, supports my findings. The study by Scenic Hudson (1986), indicated that landowners were interested in preserving land for a variety of ecocentric (environmental concern, desire to protect wildlife, a sense of stewardship), financial, practical (resource protection), and family reasons. This study did not examine the incentives of recreational opportunities and educational opportunities, family tradition, or whether friends, neighbours or relatives were participating.

Seventy-four percent of conservation professionals also indicated that financial incentives were important and 59% indicated that other incentives were important.

Comments by some of these conservation professionals suggested that financial incentives may be particularly important for preservation type efforts. There are no financial gains to the landowner with this type of effort, yet the landowner is asked to give up certain land and resource uses. Previous studies did not examine the perspectives of conservation professionals. The literature, however, strongly advocates the use of incentives for encouraging private land conservation (Canadian Advisory Council 1991; Denhez 1992; McNeely et al. 1990; Rubec 1995; World Resource Institute et al. 1992). Empirical studies have also recommended financial incentives (Brusnyk et al. 1990; Kellert 1981; Melinchuk 1987; Russell and Eskowich 1989; Smutko 1986; Van Patter et al. 1990).

There have been no studies examining the variables associated with perceptions of incentives to participation. My results indicated that perceptions of incentives are associated with various personal and land variables, conservation knowledge, and participation in various nature-related activities and programs. Rural landowners, particularly farmers, were particularly motivated by opportunities for wildlife viewing, providing hunting and fishing opportunities, and social incentives.

6.2.4 Factors Discouraging Participation in Private Land Conservation

The only disincentive to which all respondents agreed was a lack of trust of government. Fifty-four percent of involved landowners, 56% of Hants County landowners and 85% of conservation professionals indicated that a lack of trust of government was an important disincentive to participation. This lack of trust was particularly prominent in the 76% of landowners with lower levels of education. Landowners' comments provide some possible insight into this issue. Some landowners indicated that they did not trust the government to keep its word and to follow through with conservation efforts. Others felt that the government has too much power and is abusing it to the detriment of the environment. Others indicated that the government is too supportive of big industry and too lenient with their environmental regulation of industry. Some landowners felt that the government is hypocritical and does not set a good example for landowners. Others cited the inconsistencies within government as their reason for concerns with government. Still other landowners did not trust the government based on negative experiences with the woodlot management program. They felt that this program worked against nature conservation and sustainable resource use. They also felt that the government did not address their concerns with the program. No other empirical studies have examined this issue, nor most of the disincentives to participation found in my study. These disincentives, however, have been discussed in some of the literature (e.g. Hilts 1989; Mitchell and Labaree 1991).

Seventy percent of Hants County landowners felt that liability issues were an important disincentive. Through their comments, some landowners also related concerns about hunters, ATV users and other recreationists using their property because of privacy invasion, intentional and unintentional vandalism, and safety issues. They expressed concern that they do not have adequate power and legislative support to control others' use of their land. Some landowners indicated that they feel social pressures to allow unlimited access to their lands. They feared that involvement in private land conservation efforts might increase such access and use of their land, and therefore increase liability and damage to the property. The Trails Act (S.N.S. 1988 c.20), was revised to reduce the liability of landowners or occupiers of privately owned lands, but only when they give their

consent to designate a trail through their property. The Occupiers of Land Liability Act ("Liability Act" 1977 R.S. c.322) may not provide adequate protection for landowners involved in private land conservation. The literature also suggests that liability and trespass issues are a disincentive for landowner involvement (Farris 1981; Lacey et al. 1988; Wildlife Advisory Council 1993).

The majority of Hants County landowners agreed that another disincentive was that they had never really given thought to conservation issues on their land. The majority of both Hants County landowners and conservation professionals agreed that other disincentives related to a need for landowners to make money from their land, and a fear of the implications of restrictions on their land uses because of the economic implications. Significantly more Hants County landowners than involved landowners agreed with statements indicating concern about economic issues. Hants landowners most likely to agree with these statements were those who own large properties, depend on their land economically, live permanently on their rural property, work in resource-based occupations, or those who have lower levels of education and/or income. On the other hand, 73% of involved landowners did not consider economic concerns an issue. Similarly, 64% of Hants County landowners, significantly more than involved landowners, were concerned about the time frame of conservation agreements. It is probable that this concern stems from their economic dependence on their land. Morgan's landowner study (1985) also found that landowner concerns about the time frame of agreements could impede participation.

The majority of both Hants County landowners and conservation professionals agreed that landowner concerns about imposition on landowner rights is a disincentive to participation, as discussed previously. Seventy-five percent of Hants County landowners also agreed that their desire for independence in their land management influences participation. Eighty-seven percent of conservation professionals agreed that a desire for independence can impede participation in private land conservation. Respondents' comments suggest that there is some general landowner resistance to any "outsider" control, including environmentalists, and that this resistance is increasing. Some landowners made comments expressing concern about maintaining as much control as

possible during private land conservation efforts, and maintaining the ability to change their land use and resource use with changing market conditions.

Fifty-four percent of conservation professionals agreed that another disincentive is a lack of trust that programs will protect land in the future. Some conservation professionals commented that landowners had expressed this concern to them in the past, with a particular fear of government selling off the land. Sixty-four percent of conservation professionals agreed that a lack of landowner consultation was another disincentive, and this issue has not been identified previously in the literature.

Over 65% of conservation professionals considered tax issues to be a disincentive to participation in private land conservation. Landowners who participate in private land conservation are required to pay property taxes, despite giving up particular rights, such as development and resource extraction rights. There is no precedent in the Province, and therefore there is uncertainty about whether removing land from tax-reduced status (forest land or agricultural land) to protect it for conservation value might increase the tax rate on the land. If it does, this disincentive would further inhibit participation in private land conservation. More involved landowners agreed with concern about property tax issues than Hants County landowners. It is likely that they have had direct experience with the tax issues through their involvement, or attempts to become involved, in private land conservation. Current income tax barriers and uncertainties about the tax implications of some private land conservation efforts were also significant. Even though the majority of involved landowners were in the over \$35,000 income bracket, and do not face the same economic challenges as many of the other landowners in the study, they agreed that income tax issues are a disincentive to participation. Their comments indicate that capital gains tax implications of donating land were particularly important to these landowners.. One landowner spent several months exploring options for donating or selling a significant property for conservation purposes. The tax issue was not resolved and may have ended attempts at private land conservation in this case. Two other landowners made comments suggesting that tax issues impeded their efforts to become involved. Some concerns were also expressed about the need to pay deed transfer taxes on properties given conservation

status. Although tax issues as a disincentive have not been studied empirically, the need for incentives is expressed widely in the literature (Denhez 1992).

The majority of conservation professionals agreed that competing incentives (e.g. forestry) could impede participation, as proposed by Caza (1993). Conservation professionals indicated that other disincentives were: a lack of landowner knowledge on options, conservation values, recognition of land of conservation value and a lack of conservation ethic, as well as a lack of educational, social and economic incentives. Literature supporting these concerns was discussed previously. Preservation-oriented conservation professionals were more likely to consider the lack of a conservation ethic and relevant knowledge, as well as incentives, to discourage participation. Individuals from non-government organizations were more likely to see tax penalties as a disincentive. Although the majority of landowners did not indicate that any of these factors were disincentives to them personally, they did agree with recommendations to address these issues. This response suggests that they may perceive these issues as disincentives to other landowners.

Variables related to perceptions of disincentives to participation have not been examined previously. In my study personal and land variables, as well variables related to participation in nature-related activities and programs, were associated with perceptions of disincentives.

6.2.5 Challenges Facing Conservation Efforts

Conservation professionals were asked about challenges facing private land conservation efforts. No other empirical studies have explored this perspective. One challenge to which most conservation professionals in this study agreed, related to coordination of efforts. Over 80% agreed that there is a lack of coordination of efforts between government, non-government and community groups. Over 50% agreed that the varied goals of different agencies challenges efforts. Over 60% agreed that there is a lack of inter-department/agency coordination. The literature emphasized this challenge (Mitchell and Labaree 1991; Munro 1989; and Moull 1987). Over 80% also agreed that the lack of communication with private landowners impedes private land conservation efforts.

Over 70% of conservation professionals agreed that another challenge is the lack of commitment to private land conservation from groups and agencies, including staff, time and financial commitment. Part of this lack of commitment has led to a lack of scientific data and information, which was also recognized by 60% of the conservation professionals. Over 60% agreed that there is a lack of legal and policy support for private land conservation efforts, and respondents from preservation-oriented and non-government groups indicated particularly strong agreement. Comments by respondents suggest that part of this lack of support might be due to a lack of political will to act for private land conservation, including making necessary policy and legislation changes. Other comments suggest negative attitudes in government agencies that view private land conservation as taking away from the local tax base, and tying up valuable land and resources. This attitude was also suggested in the literature (Elfring 1989). A general lack of commitment, particularly adequate legal support and funding, was expressed as a concern by Mitchell and Labaree (1991), Moull (1987) and Munro (1989). Caza (1993), and Rubec (1995) emphasized the impacts of land and resource policies on the use of private land. None of these issues, however, have been studied empirically.

Another challenge with which over 60% of conservation professionals agreed, was the lack of permanency of private land conservation programs/efforts, as volunteer efforts and funding levels fluctuate. Rakowski and Massey (1993) and Moull (1987) also indicate concerns about the permanence of programs. Over 50% of conservation professionals

agreed that a lack of skill and experience among personnel of agencies and groups, and specifically a lack of adequate knowledge about options for private land conservation, challenged private land conservation efforts. This finding is echoed in the work of Mitchell and Labaree (1991). Property tax implications for non-government groups were seen as a challenge by the majority of conservation professionals, particularly individuals from preservation-oriented and non-government groups. The conservation literature also discusses these challenges (Denhez 1992).

Conservation professionals, as well as respondents from the two landowner groups, also commented that there were challenges posed by local social, economic and resource use trends. They suggested, for example, that there are pressures on rural lands resulting from urban sprawl and recreational property development. They suggested that at the same time there is a decrease in the number of family members interested in taking over family farms and rural properties, largely because they do not consider farming economically feasible. Once landowners give the land to the next generation, it is likely that many lands may be sold to development or resource extraction interests, or they may be independently logged, to deal with economic challenges. They also suggested that there is a high degree of land flipping and speculation, which has negative consequences for private land conservation efforts. Another issue that was suggested related to the persistent lack of employment opportunities for local people, which may create a social and economic climate that may inhibit private land conservation efforts. The extent and nature of forestry activity in the Province was also suggested to be a challenge to private land conservation efforts. Such activity may make the decision to become involved in private land conservation more difficult for landowners. There were also concerns expressed about the negative consequences of the forest industry for landowners, woodworkers, the environment and private land conservation efforts. These issues are also discussed in the literature (Filyk 1992). Although there may be little private land conservation professionals can do to address these issues, they should at least be aware of their influence on private land conservation and should be open to creative approaches to addressing them.

6.2.6 Respondents' Recommendations for Enhancing Private Land Conservation

This study was unique in that it identified respondents' recommendations for enhancing private land conservation. A few particular items were examined in previous studies, including preferences for incentives, institutional options and conservation tools. However, most recommendations examined in this study were not examined previously. The results of this study suggest that the most important recommendations, agreed upon by over 80% of respondents, related to a need for a variety of incentives, increased educational efforts, accessibility for landowners, appropriate infrastructure and tools, and effective approaches to private land conservation. Specific recommendations are discussed in Section 6.3 as they relate to potential actions to address the main issues influencing private land conservation in the Province.

6.2.7 Preferences for Institutional Options

This study revealed that, unlike in previous studies, preferences for institutional arrangements varied considerably, with no clear separation between the most and least preferred options (Kreutzwiser and Pietraszko 1986). Similar to previous studies, there was interest in all three levels of government, and in non-government groups and local community groups, as well as a coalition of all interest groups (Agency of Environmental Conservation 1982; Scenic Hudson 1986).

Responses by Hants County landowners suggest that this group felt particularly strongly that landowners should be involved in all aspects of private land conservation including programs, funding, and holding conservation agreements, and most importantly, managing their land. This result has not been found in other studies. Over 80% of Hants County landowners, particularly those who working in resource-based occupations, felt strongly that private landowners should be involved in land management. The low level of agreement with this by involved landowners may be because these landowners were familiar with the idea of donating or selling land for nature preservation purposes. They may, therefore, be more comfortable with the landowner taking a less active role in the land management.

One somewhat unexpected result was the support for government involvement, particularly the provincial government, in private land conservation efforts. This result seems somewhat contradictory since both landowners and conservation professionals indicated a strong landowner distrust of government. They were both concerned that such distrust could inhibit participation in private land conservation efforts. Many of the same landowners who supported government involvement in private land conservation also revealed their own lack of trust in government and their resistance to participating in government programs. It is possible that respondents were familiar with the provincial role in other programs such as resource management and provincial park management. Government programs may be the only prior contact some landowners have had with land and resource issues. Some landowners may not have been as familiar with alternatives such as coalitions and private organizations. Those landowners who did not support

government involvement in programs and land management were more likely to have rural backgrounds, and to have owned their land for over 10 years.

Flexibility in preferences for institutional arrangements was linked with several variables. Hants County landowners were much less flexible than involved landowners and conservation professionals in their preferences for institutional arrangements. Within the groups of Hants County landowners, those individuals who were less likely to be flexible in their preferences were older, had resource-based occupations, and rural backgrounds. Those landowners who were long time owners, who depended on their land economically, those who acquired their lands through family and/or who were permanent residents on their rural land, were also less flexible in their preferences. Finally, landowners with low levels of environmental concern and conservation knowledge were less flexible in their preferences. It is possible that these less flexible individuals were unfamiliar with certain institutional arrangements and were, therefore, less open in their preferences. Specifically, acceptance of coalitions and private conservation organizations for different roles in private land conservation was stronger for those landowners who were younger, who had urban backgrounds, who not acquired their land through their family and who were not permanent residents on their rural property. Alternatively, the lack of interest in various institutional arrangements may indicate a lack of interest in being involved. Landowners may want to keep to themselves and do what they want with the land.

Sixty-seven percent of conservation professionals expressed concerns about the permanence of institutional arrangements. They commented that some landowners had expressed concerns to them in the past about the security of lands donated or held in conservation agreements. The landowners, according to these comments, feared that conservation groups may dissolve or that policies or priorities may change, and that conservation land may then be sold or developed.

Variables related to preferences that were found in previous studies included education, occupation, size of property and economic importance of the land (Agency of Environmental Conservation 1982; Kreutzwiser and Pietraszko 1986; Scenic Hudson 1986). New variables identified in this study were: age, income, background, conservation knowledge, method of acquisition of the land, residence, and participation in nature-related

activities and programs. Specifically, some of the relevant relationships between these variables included one in which older landowners, or landowners who had been owners for longer periods and were permanent residents on their rural property were less supportive of coalitions and private organizations. Landowners of rural backgrounds were less likely to support government involvement. Landowners of larger properties and who worked in resource-based occupations were more likely to agree that private landowners should manage their own land.

The results of the survey, and interviews with individuals from conservation agencies and organizations suggested that there may be a lack of adequate institutional arrangements for private land conservation. Several landowners from both survey groups made comments about negative experiences in their attempts to become involved in private land conservation because there was not an organization or group suited to their needs. The literature suggests that narrowly defined institutions focus on a particular subset of landowners, and limit participation by others (Edwards and Sharp 1990).

6.2.8 Preferences for Conservation Tools for Private Land Conservation

The most preferred tool for private land conservation was landowner consultation, with over 70% of all respondents supporting this option. Previous studies support this finding (Agency of Environmental Conservation 1982; Hilts 1989; Kreutzwiser and Pietraszko 1986). Other options supported by the majority of all respondents were written agreements, conservation easements and rights of first refusal agreements. Although other studies have found landowner support for these options (Gobster and Dickhut 1988; Moull 1987; Scenic Hudson 1986), some studies found that landowners are not in favour of highly committing options such as conservation easements (Hilts 1989a; Van Patter et al. 1990).

A surprising and particularly noteworthy result was that respondents did not support verbal agreements, which have been one of the most popular tools in other landowner studies (Hilts 1989; Kreutzwiser and Pietraszko 1986; Waddell 1990). Comments made by respondents suggest that verbal agreements may be too weak, that they could lead to misunderstanding, and that they would not be honoured. Most respondents also did not support large government grants for landowners. Comments suggest that landowners abuse too many grants currently available, or use them inappropriately. Although this particular option was not studied previously, findings have suggested that landowners find some expensive incentives for landowners to be excessive (Van Patter et al. 1990). Hants County landowners did not support leases for conservation purposes, although both involved landowners and conservation professionals did, and leases were popular in other landowner studies in the prairies (Melinchuk 1987).

Landowners did not support zoning for conservation. This result is similar to findings of other studies that landowners strongly opposed command and control approaches, based on increased legislation and restrictions (Van Patter et al. 1990). The literature suggests that these approaches would likely evoke public opposition and controversy. Comments by landowners in this study suggested that some of the opposition to zoning may relate to a concern about insufficient resources to police such an effort. Other comments suggested that since the land is privately owned, it is not a responsibility of the municipality, and that landowners fear that zoning is too permanent. Some farmers

reported experience with agricultural zoning that has made it difficult to sell their land or to let their children have options for using the land. Overall, the responses of Hants County landowners suggested a preference for voluntary methods that maintain landowner control and ownership of the land.

Also similar to previous findings, most landowners supported short term and flexible agreements. Landowners with higher levels of education, and income, and who had urban backgrounds, and landowners who were involved in or exploring involvement in private land conservation efforts were more likely to support longer term agreements. Some involved landowners made comments indicating that agreements are only valid if they are long-term. Others commented that although long-term agreements are vital for preservation of nature, shorter term agreements may be an important first step in achieving long term protection. They suggested that in other cases such agreements may provide a buffer of sustainably managed lands to complement the protected areas network. The majority of all respondents agreed with recommendations for flexible agreements. Such agreements would enable a step-by-step process through which landowners could become increasingly involved and committed over time as they learned more and gained confidence and trust in the private land conservation effort. Newer landowners and those with lower incomes and education and rural backgrounds were particularly concerned about agreements that would tie up their land and resources over a long period. Although involved landowners were more interested in longer term agreements than Hants County landowners, their comments suggest that flexible agreements and trial periods could encourage cooperation from a large number of landowners.

Hants County landowners and conservation professionals supported management agreements. Moull (1987) also found that landowners supported this option. It is possible that involved landowners were less supportive of this option since they were more likely to support and to consider participation in preservation-oriented efforts that do not involve active management of the land. They may also be less familiar with woodlot management programs (based on management agreements) than rural landowners.

Most landowners did not support sale or donation of land to the government for conservation purposes. It is possible that this result relates to the lack of trust of

government discussed previously. Some of the conservation professionals did support this option, particularly government employees.

Some variables influencing preferences for conservation tools were similar to previous studies including age (Gobster and Dickhut 1988), and land uses and proportion of natural area on the property (Kreutzwiser and Pietraszko 1986). In this study, other variables related to preferences included: education, background, size of property, method of acquisition of the property, economic importance of the land, and environmental concern.

There was a fairly high level of variation in preferences. This variation differs from previous studies in which there was homogeneity in responses and a clear separation between the most and least preferred options (Kreutzwiser and Pietraszko 1986). Support for tools was significantly higher for conservation professionals and involved landowners, possibly because these groups are more familiar with the tools and more interested in private land conservation. They supported almost all conservation tools, including options for donating or selling land and interests in land for conservation, as well as zoning for conservation. Although the perspectives of these two groups have not been studied empirically, the literature suggests that the tools they supported are important in meeting the needs of all landowners (Board on Environmental Studies and Toxicology and Commission of Life Sciences 1993; Evans 1992; Hilts and McLellan 1984; Van Patter and Hilts 1990).

6.2.9 Variables Related to Participation

My study found that Hants County landowners and involved landowners differed in terms of many of the study variables. Hants County landowners were significantly more likely to be male, engaged in resource-based occupations, to have lower income and education, and to have a rural background. They were more likely to have attained their property through their family, and to be permanent residents on their rural property. They were less likely to be members of conservation groups, or to be involved in a conservation program, or to practice conservation activities on their land. They were significantly different in their attitudes, knowledge, preferences and recommendations. Overall, Hants County landowners were more focused on economic concerns, and control of their land resource uses and management.

Within the Hants County landowner group, a sub-group was identified that was similar to the involved landowners in terms of socio-economic status and attitudes, knowledge and preference. This sub-group expressed more interest in participating in private land conservation, and may be more likely to participate than other Hants County landowners. The involved landowners, and this sub-group of Hants County landowners represent an important sub-group with particular needs, interests, and concerns, distinct from those of other landowners. Brusnyk et al. (1990) found that landowners who participation in private land conservation programs tended to be more highly educated, to have higher net income levels, and more family employed off the farm. Hilts (1991) also found that landowners who donated conservation easements were more likely to be fairly wealthy individuals, over 50 years old, whose primary motivation was a love of the land, and who were not residents of their rural property.

6.3 The Main Issues Influencing Private Land Conservation and Recommended Actions

Patterns in the survey responses suggest several overall themes that were used to identify the main issues influencing private land conservation. These issues, which must be addressed to ensure successful conservation efforts in Nova Scotia, are:

- Information needs
- Economic issues
- Landowner concerns
- Conservation tools
- Institutional options
- Educational needs
- Integrated planning and coordination
- Approach-related issues

Recent social science research on community-based social marketing suggests that in attempting to change behaviours related to the environment, the multiple barriers or issues influencing a behaviour must be addressed simultaneously (McKenzie-Mohr 1996). This includes those barriers internal (e.g. attitudes, knowledge) and external (e.g. economic obstacles, convenience) to the individuals whose behaviour is of interest. The following section provides a discussion of the survey results in terms of each of these main issues, as well as how the results suggest addressing each issue. Relevant insights from the literature, background research, and respondents' comments from the questionnaires and personal interviews are also discussed.

6.3.1 Information Needs

Background study on the current status of private land conservation in Nova Scotia revealed that data bases, scientific information and other resources are lacking. Specifically, the information about significant features on private lands, which is the information upon which private land conservation efforts should be based, is inadequate. Over 60% of conservation professionals felt that this lack of sufficient information was an obstacle to effective private land conservation. The necessary actions to address this lack of information include efforts by the Department of Natural Resources to extend its field study of crown lands to include all private lands in the Province. These efforts must identify and map significant habitats, ecologically-significant sites and areas in need of protection, based on a provincial system of representative natural landscapes. In other provinces, such as Ontario and Prince Edward Island, a significant effort has been made to study and document all areas of conservation value. This information must then be synthesized in a common database and made available to the various private land conservation interests so that a strategic plan and priorities can be established. Maps could be produced that demonstrate the importance of private land to effective private land conservation in Nova Scotia. These maps could then be used in promotional events and activities and public consultation. At the same time, a private conservation group, such as the Nova Scotia Nature Trust, should initiate an effort to collect local knowledge about significant features on private land, through community-based groups. Other information gathering efforts, such as the Department of Fisheries and Oceans and Nova Scotia Department of Fisheries efforts to support community based activities should also be encouraged and the information integrated with existing information. Non-government groups may achieve greater success in these efforts than government agencies because of the lack of trust of government revealed in the study results.

6.3.2 Economic Issues

The results of the study suggested that there are economic obstacles to both landowner participation in private land conservation, and to the administration of conservation efforts.

6.3.2.1 Economic Influences on Participation

Landowners may want to do what is best for the environment and for conservation, but my study suggested that they are limited by economic realities. Over 60% of Hants County landowners were at least somewhat economically dependent on their land, or needed it as financial security for the future. Responses suggested that many landowners could not afford any decrease in income from their land, nor could they afford extra expenses for conservation, such as the cost of negotiating agreements, paying deed transfer taxes, or monitoring and enforcing agreements. Over 40% of landowners in the survey had household incomes under \$25,000. Over 50% indicated that they need to make money from their land, and that this could be a disincentive to their participation. Some respondents also expressed a concern about the implications of recent increases in activity in the forest sector, and the pressures on financially stressed rural landowners to sell logging rights or land to forest companies, or to partake in non-sustainable harvesting for immediate profit. Seventy-seven percent of conservation professionals feared that these competing incentives could undermine private land conservation efforts. Income and property tax implications of private land conservation also add to the economic obstacles for landowners.

If landowners are to risk losing future economic gains by giving up certain land use rights, to maintain the property without economic return from the resources, and to incur additional expenses, the marginal costs of conservation, including its magnitude and the distribution of costs, must be lowered. Conservation literature suggests that this can be achieved by lowering costs to the landowner or increasing the benefits of protection (Danielson and Leitch 1986; Edwards and Sharp 1990; Maynard 1995; Van Vurren and Roy 1993).

To offset costs and increase benefits of conservation, the majority of respondents agreed with recommendations to provide financial, educational and social incentives. The most preferred incentives were education and tax incentives supported by over 80% of respondents. These incentives should, therefore, be the focus of an incentive program. Seventy-seven percent of conservation professionals indicated that a lack of these incentives is an important challenge to private land conservation efforts. Over 70% of all respondents agreed with recommendations that these incentives be matched to the level of conservation commitment involved. A stewardship award, for example, may be appropriate for a resource-conservation type written agreement, whereas property and tax breaks may be appropriate for the donation of a conservation easement.

Over 80% of respondents from all survey groups recommended property tax breaks to encourage participation in private land conservation. Removal of land taxes would not likely burden municipalities greatly since the number of such properties would be small. Yet a tax break would provide an important symbolic and psychological impetus for landowners. Tax breaks have been used successfully to encourage participation in private land conservation in other areas, such as in the Natural Heritage Tax in Ontario (Hilts 1989). Over 80% of respondents also recommended income tax breaks as an incentive for private land conservation. This could be achieved by amending the Federal Tax Act to eliminate capital gains taxes on donations or even sale of land or interests in land (easements) for conservation purposes (Denhez 1992).

Sixty percent of respondents, including 80% of conservation professionals, agreed with recommendations for small grants for landowners. Hants County landowners (particularly those with rural backgrounds) and conservation professionals (particularly those from non-government groups), supported the idea of cash incentives. Unfortunately, it is unlikely that grants or cash incentives would be economically feasible in Nova Scotia.

Economic issues were particularly relevant to certain landowner groups and particular conservation efforts, based on analysis comparing sub-groups of landowners and examining correlation between variables. Economic incentives were most important for large rural landowners who were economically dependent on their land, individuals employed in resource-based occupations, and landowners in lower income brackets. These

landowners indicated concern about economic issues. Respondents' comments suggested that some landowners also felt that they were being pressured into unwanted exploitation of their land and resources for economic reasons. Economic incentives may also be important for landowners familiar with the woodlot management program because comments suggest that they may expect a similar type of financial benefit to accrue from private land conservation. Economic incentives are important for preservation-oriented efforts. Conservation professionals commented that efforts should be made to ensure that preservation is as economically attractive as resource conservation efforts. This is important to compensate for the more significant sacrifice of land and resource uses or rights required, including traditional sources of income from resource extraction activities. It would appear from these results that there is a need for a program of targeted incentives to ensure that resources are allocated efficiently and that all landowner needs are addressed.

Another approach to reducing the cost of private land conservation to landowners is through organization and program related mechanisms. For example, over 50% of respondents agreed with the recommendation for flexible agreements that allow economic security for the future, and stewardship agreements that allow for some economic use of resources. Flexible agreements were particularly important to Hants County landowners with lower incomes. Sixty-seven of Hants County landowners and conservation professionals agreed with recommendations for cost-sharing efforts to encourage private land conservation and to help overcome economic barriers. Cost sharing was particularly supported by landowners who were permanent residents of their rural property, and those who were economically dependent on their land. Institutions could provide services such as legal and survey services and advice, to minimize costs to the landowner.

The cost of private land conservation for landowners can be offset by providing additional non-monetary benefits. Over 80% of all respondents agreed with recommendations to provide educational incentives. In existing landowner contact work, landowners have been enthusiastic to learn that they owned something considered to be ecologically significant. They appreciated receiving information about their land (Hilts et al. 1991).

Although not as many landowners recommended social incentives, almost 60% of Hants County landowners indicated that involvement of their friends, relatives and neighbours might motivate their own participation. The lack of Hants landowner support for social incentives may be due to a lack of familiarity with them, or a lack of understanding of the concept. Other landowner contact programs throughout Canada have used social incentives and recommend them strongly (Hilts 1993a). Sixty-seven percent of involved landowners, and 78% of conservation professionals agreed with recommendations to provide social incentives. Social incentives that involve public display of participants' names can also serve another purpose. They increase the likelihood of landowners honouring their commitment to private land conservation (McKenzie-Mohr 1996).

6.3.2.2 Economic Obstacles to Conservation Efforts

There were important economic issues facing the implementation of private land conservation efforts. First, 79% of conservation professionals agreed that there is inadequate financial commitment to private land conservation efforts. There is, therefore, a need for creativity in funding such efforts. Respondents' comments included recommendations for increased partnerships between government and private groups, and fund-raising by private groups. Partnerships are strongly recommended in other research (Filyk 1992). The literature has suggested other creative funding mechanisms for private land conservation such as trusts and endowment funds, tax programs, and encouraging participating landowners to provide funding or to assist with securing funding for on-going management and monitoring costs (Cox 1995; Edwards 1994).

My review of research indicated that there is an inadequate amount of research supporting the economic rationale for private land conservation efforts generally, and specifically in the Nova Scotian context. Some respondents suggested conducting research on the costs and benefits of alternative methods of protecting private lands for conservation purposes. The economic arguments favouring private land conservation could then be used as leverage to obtain additional funding.

The literature suggests that private conservation organizations face specific economic challenges (Filyk 1992). They are subject to land taxes, which can be significant, particularly if an organization acquires a large number of properties. The majority of conservation professionals agreed that property tax issues for conservation groups are serious disincentives for private land conservation. Over 80% of conservation professionals agreed with recommendations to amend property tax rules to ensure that municipalities exercise their option to remove this tax burden. These amendments could eliminate or significantly reduce property taxes for conservation organizations holding lands for conservation purposes. There are, however, specific attitudes within municipal governments that may work against conservation (Elfring 1989). There are fears related to a loss of tax dollars and a loss of land and resources for the community. Municipalities, therefore, may be resistant to encouraging private land conservation efforts and resistant to providing tax exemptions.

Private organizations may also face several liability issues, related to people (officers, staff, members and individuals using their property), as well as property (including the environment). In response to the high cost of insurance, some respondents' comments suggested changes to the Liability Act to protect conservation groups, and the provision of information about liability issues for these groups. The majority of conservation professionals supported grants for non-government organizations to assist in setting up private land conservation efforts and overcoming some of the economic barriers that they face, including insurance costs. Respondents from non-governmental organizations and from preservation-oriented efforts strongly supported the idea of such grants. They commented that preservation efforts in particular need funding assistance since they are based more on acquisition of land than resource-conservation efforts are.

6.3.3 Landowner Concerns

There were several important landowner concerns that may inhibit private land conservation efforts. These concerns were not important to involved landowners, but were significant for Hants County landowners. Since woodlot owners own 50% of the Province's forested land, and private landowners own almost three quarters of the total land in the Province, the potential impact of these concerns is significant.

Trespass and Liability Issues

As discussed above, 70% of Hants County landowners were concerned about liability issues. One action to address this issue is to clarify and make the necessary amendments to the Liability Act, if required, to ensure that landowners participating in private land conservation are not unduly burdened with additional liability. Another possible action is to provide recognition of the issue and information for landowners on the most likely sources of liability, through a landowner education program.

Concern About Heirs

The concerns of Hants County landowners about preserving land for their children and maintaining their family heritage on the lands have implications for private land conservation. Many landowners may be hesitant to enter into conservation agreements perceived to restrict future family use of the land and resources. To address this issue, landowners must be provided with information about private land conservation options that enable family use of the land, and that provide advantages to heirs of the property.

Concern About Landowner Rights and Control

Landowners' responses reflected their concern about their rights as landowners, and their desire for independence in how they use and manage their land. To address these concerns, private land conservation professionals must work to ensure that their efforts are not perceived as restrictions being imposed on landowners. Information must be provided on how involvement in private land conservation can still allow for landowner independence and control. To address concerns about the restrictions of various land and resource programs, policies and legislation for rural landowners, educational efforts should

include information about, or access to sources of information about these issues and initiatives.

Lack of Trust of Government

Another issue of concern to landowners is a lack of trust of government. Over 65% of all conservation professionals and involved landowners recommended a range of institutional options for private land conservation, and this must include non-government options. The roles government plays in private land conservation efforts should be carefully considered. The results of this study suggest that landowner contact work and community-based information-gathering and sharing should probably be the responsibility of non-government groups.

6.3.4 The Need for Adequate Tools for Private Land Conservation

Preferences for conservation tools varied considerably among respondents. There is, therefore, a need to make a variety of options available, including options to donate, sell and maintain ownership of the land. Over 80% of all landowners and conservation professionals recommended a variety of options for private land conservation. Many respondents also recommended flexibility in the use of these tools. The most widely accepted option was landowner contact. Over 70% of Hants County landowners supported this tool, and over 85% of all other respondents. The finding that the majority of respondents to the Hants County landowner survey chose to have a personal interview rather than to answer the questionnaire on their own, may also give further indication of the importance of landowner contact.

Other options accepted by the majority of respondents in all survey groups were: written agreements, easements, and rights of first refusal agreements. Involved landowners and conservation professionals supported other options for donating or selling land, and these options should also be made as attractive as possible. Although many options should be made available to landowners, the most preferred options should be made as attractive as possible. Unless future study or pilot testing indicates support for sale of land to government, zoning for conservation, verbal agreements, and leases for private land conservation, these options should not be the focus of private land conservation efforts. They were not supported in the study. Further study may be warranted for verbal agreements, based on their success in private land conservation efforts elsewhere in Canada (Hilts 1993a; Waddell 1989). A pilot landowner contact program, for example, could explore landowner attitudes about and support for verbal agreements.

Considering respondents' comments, and background research and interviews, it seems that there may be inadequate tools available to meet landowners needs. Several landowners in the study made comments about attempting to become involved in private land conservation only to find that there was no agreement or arrangement appropriate for their needs. In particular, there appears to be no intermediate type agreements for those landowners without large or provincially significant properties. There are currently no agreements for landowners interested in private land conservation, but who wish to

maintain some economic uses of their land and resources (other than specific agreements for woodlot management or protection of a wetland). Over 50% of all landowners in the survey, including over 80% of Hants County landowners, expressed interest in a stewardship type agreement that involves resource conservation rather than preservation. The results suggest that there may be a market for this type of agreement. Without such an alternative, interested landowners may be turned away by a conservation group (such as a land trust or conservancy), even though their commitment and interest would likely have grown had they been offered a more flexible agreement. Lands under stewardship type agreements may also be an important complement to strongly protected lands.

There is a need for a range of agreement time frame options, including short term, flexible agreements as well as long term, permanent ones, to meet all landowner needs and concerns. A range of options would ensure that there is at least one option available that most landowners would support. This is important so that private land conservation efforts can begin in a positive way, by focusing on landowners' interests. In community-based social marketing research, it has been shown that commitment to a behaviour change can be enhanced by beginning with obtaining a small initial commitment (McKenzie-Mohr 1996).

Eighty percent of respondents from all survey groups favoured making the process for landowner involvement in private land conservation easy and accessible, by streamlining the process for involvement and ensuring that tools are easy to understand, efficient to complete and accessible to all landowners. Standardized agreement forms for all private land conservation efforts could help to ensure that conservation tools are effective and responsive to landowner needs. The forms should clearly define roles and responsibilities (such as who is responsible for monitoring the land). At the same time, over 50% agreed with recommendations to make agreements flexible, so that they allow graduated involvement, through a step-by-step process, and address concerns about economic security for the future. Social science research supports the need for a graduated approach, to allow the individuals (landowners) to slowly build their level of commitment, trust and interest (McKenzie-Mohr 1996).

To date, there has been minimal landowner contact work undertaken in the Province, and little information shared about the potential options available. This lack of information may relate to the lack of interest in some options. Educational efforts focused on private land conservation tools could be important in enhancing private land conservation. They were recommended by over 80% of respondents. Education could also be used to provide landowners with information on the rationale for longer term conservation agreements.

6.3.5 The Need for Adequate Institutional Options for Private Land Conservation

Considering the diverse preferences for institutional options found in the study, it would seem that a range of options must be made available in the Province. Sixty-seven percent of involved landowners agreed with recommendations for such a range. A more flexible and dynamic arrangement, involving more local groups, could spread the private benefits of protection across a greater cross-section of landowners. Such an arrangement would also provide more opportunities for the evolution of alternatives and creative solutions for private land conservation issues. A range of options would also ensure that at least one option is available that is credible in the eyes of most landowners. Credibility of the information source has been shown to be an important influence on receptivity to environment/sustainability information (McKenzie-Mohr 1996).

The lack of flexibility in preferences for institutional options may be because some individuals were unfamiliar with certain institutional arrangements and were, therefore, less open in their preferences. Educational efforts about options available could be very beneficial. They were recommended by over 80% of all respondents. These efforts would be particularly important for rural landowners, (having a rural background, employed in resource-based occupations, owners for over 10 years, economically dependent on the land) since they were less supportive of some options than other landowners.

To address concerns about the long-term viability of private conservation groups, some respondents made comments recommending expansion of the institutional framework to increase the likelihood of long-term success of the institutions. They also suggested providing support to smaller local groups that are less likely to be long-term. Programs and arrangements could be put in place to provide a back-up to ensure that conservation agreements and properties donated to these smaller groups can be held in perpetuity by another group, such as a provincial land trust.

In response to the lack of community level non-government options currently available to landowners in the Province, there should be a network of private efforts. Such a network could share resources, information and expertise and provide the necessary support for emerging efforts.

Respondents' comments suggested that the government take on the following roles in private land conservation: provide data and information on priority areas for conservation, provide technical support, ensure that adequate mechanisms are in place to support private land conservation efforts, provide educational materials for landowners and for conservation professionals, ensure stewardship of areas under their control (such as corporate stewardship); and provide funding and support for non-government groups to facilitate private land conservation initiatives. They felt that the government groups should not work directly with the landowners and local communities.

Recommended roles of non-government agencies include: provide a non-government alternative; develop private land conservation strategies and programs at the appropriate scale; provide landowner contact work and other education and promotion, provide networks to support and encourage other private efforts; acquire properties for conservation purposes; and undertake fund-raising efforts (including providing matching funds and leverage of public funds).

6.3.6 Education and Promotion Issues

Landowner Education Needs

My study revealed that perceived landowner knowledge about conservation, and specifically private land conservation, is limited. The results also revealed a difference in the perceived level of knowledge of Hants County landowners compared to involved landowners. Over 80% of conservation professionals agreed that a lack of landowner knowledge of options, and a lack of adequate conservation values, were important challenges facing private land conservation. Eighty-two percent also agreed that a lack of educational incentives discouraged participation in private land conservation. Some respondents made comments expressing concern that present services, such as extension of government agencies, are already declining.

The survey results related to conservation attitudes also suggested the need for landowner education. The results indicated that involved landowners had more positive attitudes than Hants County landowners, and that some existing attitudes of Hants County landowners may work against private land conservation. Specifically, Hants County landowners were not as concerned about the environment, some had a narrow resource-use and utilitarian perspective of conservation, and many had concerns about landowner rights, a desire for independence and a concern about restrictions on their use and management of the land.

Respondents recognized the need for educational efforts in that over 80% agreed with recommendations to provide landowners with relevant information about private land conservation. Specifically, they agreed with recommendations to provide information on how to practice conservation. Since there were numerous landowner comments about the forest industry, clearcutting and concerns about the woodlot management program, additional information about environmentally-friendly and responsible land management, considerations for sensitive habitats and sustainable resources use could be provided as a complement to specific information on private land conservation. Over 80% of respondents agreed with recommendations to provide information on the 'science' of nature conservation. Many landowners also made comments, however, about existing landowner knowledge and experience on the land. Traditional knowledge should be

acknowledged and promoted, and integrated into conservation efforts. Over 80% of respondents agreed with recommendations to provide information on the value of specific properties for private land conservation. Locally relevant information such as aerial photographs, maps and biophysical data can be used to supply this information, and to increase local interest (Hilts 1993). Over 80% of all respondents also agreed with recommendations to provide information on how to become involved in private land conservation efforts through information on landowner options and contacts within various conservation groups or agencies.

Considering the results related to attitudes, it is important to design education programs that encourage more supportive attitudes by increasing landowners' sense of stewardship and personal responsibility for the land. Over 80% of respondents agreed with recommendations to provide information on the benefits of private land conservation to change these negative attitudes. Over 80% of all respondents also recognized the need for providing education on the diverse values of nature conservation. This could include the differences between resource conservation/sustainable resource development and preservation of nature, and the need for both types of conservation. The literature strongly advocates landowner education to enhance attitudes (Griffin 1991; Smutko 1986), and one paper even suggests that there is no culture of preservation in Atlantic Canada (Harvey 1993). My results suggest that education to address attitudes and to increase support for private land conservation may be less important for landowners who have already expressed an interest in such conservation. Their attitudes were generally already sympathetic to conservation concerns.

Educational Approaches

The results suggested that the approaches used in educational efforts must be appropriate to landowner needs and interests, and information must be accessible to landowners. Specifically, over 80% of respondents in all survey groups agreed with using a diverse range of approaches to providing information. The preferred method was overwhelmingly one-on-one contact, through personal meetings held in the landowners' homes. This is a familiar form of information sharing for many rural landowners. It allows

them to feel comfortable. Over 70% of all respondents agreed with recommendations for a landowner contact program. Social science research suggests that personal exchange is the most effective way to change behaviour (McKenzie-Mohr 1996).

Respondents' comments suggested that many respondents favoured alternatives to written material for receiving information about private land conservation. Most rural landowners did not have a high level of education, and their comments suggested that they were not familiar with or interested in reading complex or long documents. Over 80% also agreed with recommendations for providing information in a format that allows them to find the answers they need to make decisions on their own.

Respondents also supported information sharing through public meetings, and small group meetings to encourage local groups to coordinate efforts, and to begin the word-of-mouth process that is important in rural areas. Many comments included recommendations to ensure local support for private land conservation by bringing on side many of the existing local groups such as farming and forestry groups. Landowners suggested that their support was vital to the success of an effort because of their traditional influence in the community. Their support is also recognized as important in other conservation programs (Atkinson 1986; Morgan 1987). These groups also provide an accepted vehicle for communication and as a source of information. Since 70% of the landowners were permanent residents on their rural properties in Hants County, it would seem that working with local groups and existing networks of support and communication could be a feasible option. In particular, community-based networks may be an important connection to those landowners most in need of education about the rationale for conservation, and education aimed at attitude change. These tend to be the large landowners, involved in resource-based occupations, who live permanently on their rural property.

The differences in land characteristics, personal characteristics and attitudes of landowners who chose to complete the questionnaire on their own and those who chose to complete the questionnaire in an interview may have implications for educational efforts (see Table 76 and Table 77 in Appendix 4). Landowners who preferred one-on-one contact for information exchange may have different needs and concerns than other landowners, based on their lower education levels, and attitudes and knowledge that were

not necessarily supportive of conservation. Specifically, they may require more emphasis on the wide array of conservation values, and the benefits of private land conservation. These efforts may require greater care in providing information at a level appropriate for landowners with less education.

The results suggested that landowners had varied educational needs. They may, therefore, require targeted educational efforts. The literature suggests that it is important for education efforts aimed at instilling behaviour change to provide vivid information that clearly relates to the individuals' prior knowledge, experience and interests (McKenzie-Mohr 1996). Efforts should be made in private land conservation to ensure that information is tailored to specific landowners, and presented in a format that is relevant and accessible.

Landowners who expressed an interest in participating in private land conservation, for example, were more likely to require only information on the options available, the advantages and disadvantages of each option and contact information for becoming involved. Supplementary literature that provides background information on why private land conservation is important, why nature conservation is important, and information on specific conservation needs and values of various landscapes in Nova Scotia could also be made available. It should, however, be a secondary focus.

Knowledge about the different factors that motivate landowners in general, compared to those factors that motivate landowners who are already committed to conservation, should also be used in promotional efforts to target specific landowner groups. Promotional efforts for landowners who express interest in participating, for example, should focus on the following: a sense of stewardship (responsibility for the land and the need to protect land for the future); the importance of private land conservation in ensuring protection of lands for the family; lifestyle incentives including preserving land for personal pleasure and heirs; an opportunity to learn about nature conservation; and environment-centered incentives including the desire to protect nature, wildlife and scenery.

The results suggest that for educational efforts aimed at a general landowner group, information should be provided to instill a conservation ethic and sense of responsibility and support for the environment and conservation. These efforts should include rationale

for private land conservation, as well as information about the options and institutional arrangements for landowners. Participation should be encouraged by emphasizing the full range of landowner benefits in advertising and promotion. These benefits include: the economic, and practical benefits of private land conservation (such as increased wildlife viewing, opportunities for recreation and the protection of economically valuable resources), the learning opportunities, the opportunity to ensure continued family tradition by passing on their land as their forefathers did; and the opportunity to protect natural heritage and historical aspects of their local area, as well as the essential ecological role of private land conservation and the importance of landowner stewardship.

There should also be specific educational efforts aimed at rural landowners. These efforts should include all the issues and incentives that are important for general educational efforts, but should be carried out through landowner contact, using existing local networks and other techniques appropriate for rural landowners. This type of information and educational approach may be particularly important for those landowners who are permanent residents on their rural land, owners of large properties, and those who are economically dependent on their land. It is also important for landowners with resource-based occupations, rural backgrounds and those having low incomes and levels of education.

The results suggest that rural landowners should also have access to information about the current restrictions on landowners due to environmental concerns. Since landowners with less education were particularly concerned about such restrictions, it seems that this information should be shared with landowners through alternative educational approaches since they may not find written materials appropriate. Such approaches include: personal contact, public meetings and informal information sharing through established networks in the community such as farming and forestry groups.

Since landowners involved in nature-oriented recreational activities, conservation groups and programs were more likely to be supportive of nature conservation generally, and more interested in private land conservation on their own land, such groups could be targeted for educational efforts. These efforts should focus on providing information on

access to options to private land conservation programs and contact information for interested landowners.

Large rural landowners showed greater likelihood to practice sustainable resource use and habitat improvement, to consider natural areas when planning and managing land and resources, and to leave natural areas alone for conservation purposes. Special efforts could be targeted for these landowners. Such efforts should emphasize their current efforts and work to increase their commitment to stronger preservation. Access to this group may be possible through local resource-based groups such as farming, forestry and game associations.

Although only 11% of the survey respondents were not resident in Nova Scotia, there should be some strategy for addressing the needs and interests of these absentee landowners.

Educational Needs for Conservation Professionals

The majority of conservation professionals agreed that conservation professionals generally lack adequate knowledge and experience for private land conservation, and that this is a challenge to private land conservation efforts. Background study on private land conservation efforts in Nova Scotia revealed that there is some information on stewardship philosophy, rationale, methods and techniques, within the Department of Natural Resources, however this information is not very accessible. Government agencies, non-government groups and community groups interested in private land conservation require information on the specific methods and tools for private land conservation. This information is important so that programs can be designed, organized and carried out in the most efficient and effective way. It is also important in light of agreement by 80% of respondents that there should be knowledgeable advisors in conservation groups and organizations to support landowners. Seventy-five percent of conservation professionals also agreed with recommendations for training for individuals involved in providing programs. A manual providing necessary information for conservation professionals and others involved in private land conservation program administration and support could be developed and made available through the Department of Natural Resources. The literature suggests that such a manual should outline the following: private land conservation philosophy and background; private land conservation tools and incentives; agencies and groups involved in private land conservation and their roles and resources; strategies and techniques for landowner contact; procedures for various conservation agreements; and the legal and tax implications of various agreements (Natural Heritage League, undated; Hilts and Reid 1993).

Some respondents made comments indicating that within conservation efforts, there is a disparity of attitudes between those who take a resource-conservation approach and those oriented towards nature preservation. This disparity is evident both within and between agencies. It leads to conflicts that can, in extreme cases, lead to irrational policy. A good example of this is evident in the recommendations for a wetland stewardship strategy for Nova Scotia (by MacDonald 1990). The report questioned the appropriateness of involving naturalist and wildlife groups, or land trusts, in provincial

wetland stewardship efforts because of their preservationist orientation. The proprietary attitude taken by various groups and agencies involved in conservation has led to a fragmentation of efforts. It can ultimately lead to a weakening of the effect of conservation efforts and a weakening of public support for conservation (World Resources Institute et al. 1992). Other comments suggested that individuals in various government agencies may see private land conservation working against other resource and land use goals, such as taxation income, resource extraction or urban development. These attitudes have been identified in other studies as well, and educational efforts are recommended to address them (Elfring 1989).

Comments from conservation professionals, and follow-up interviews with individuals from the non-government conservation groups in the Province revealed that there is also a lack of information available for groups such as local land trusts who are interested in initiating local efforts. Some interested respondents, for example, were uncertain about how to proceed with forming such a group, how to fund private land conservation efforts and what is involved in becoming responsible for private lands. Some respondents were somewhat unclear about their options for involvement with private land conservation, the tools that they could make available to landowners, and the financial and other implications of various options. There has not been much networking among the separate efforts in the Province, yet the experiences of each could provide a wealth of information and experience for others. There is also a vast amount of information available through larger land trust networks, particularly in the United States, and through the "internet". These resources could easily be shared among Nova Scotian efforts. A network of private conservation groups should be formed to provide the necessary support, advice and access to resources for new private groups. Information could be provided on how to create a private land conservation group, information on promotion and fund-raising, contacts in other conservation groups, and other information relevant to getting an effort started.

Public Education/Promotion Needs

Respondents considered social, economic, political and legal commitment as essential for effective private land conservation. Yet 79% of conservation professionals agreed that there is a lack of such commitment, with both government and non-government efforts. Preservation-oriented professionals and non-government groups were particularly concerned about this issue, likely because they felt that preservation-oriented efforts are less supported than resource conservation efforts. Over 75% of involved landowners and 50% of Hants County landowners also recognized the lack of such support and its crucial role in private land conservation efforts. Some respondents expressed concern about ensuring that private land conservation becomes more prominent on the political agenda, and they expressed frustration with a lack of progress on this front. To address complaints about a lack of political will to act for private land conservation, respondents suggested that initiative is needed from the community to show the need for changes, before the government can respond. Government employees in particular indicated that the government needs to hear from lobby groups and individual concerned citizens. Other comments focused on concerns about existing resource policies that encourage resource exploitation, such as tax breaks for land used for forestry or agriculture. Respondents' comments also highlighted the significance of the broader issues influencing private land conservation, the most important being general social attitudes and values. The prevalence of economic concerns, a tradition of resource exploitation, and a focus on a short-term perspective, for example, work against sustainability generally, and nature conservation and private land conservation efforts specifically.

Over 66% of Hants County landowners, and over 90% of all other respondents agreed with recommendations to ensure that there is a strong commitment to private land conservation, including time, human and financial resources. There is, therefore, a need for educational efforts aimed at government agencies and policy makers to increase awareness of private land conservation issues and options, and the benefits of private land conservation. One Nova Scotian study suggests that specific educational efforts should be aimed at municipal planners, since they have access to several tools that could support

private land conservation efforts (Evans 1992). The document outlines numerous initiatives for using land use planning tools to address conservation issues.

Considering concerns about the lack of support for private land conservation efforts and some attitudes that may work against conservation, it seems that there is a need for educational efforts aimed at the general public. Such education should aim to increase understanding of conservation concerns and interests, and awareness of the importance of nature conservation. It should also aim to increase awareness of the role of private lands in nature conservation (Prince Edward Island Department of Environmental Resources 1994; Rousseau 1993). Continued public education efforts aimed at instilling an environmental ethic are also important, and are recommended throughout the literature (Biodiversity Working Group 1994; Burnett and Hundert 1994; Canadian Environmental Advisory Council 1991; Dottavio et al. 1990; Hamilton 1993; Public Review Committee 1995). Conservation professionals should be cognizant of the issues limiting support for private land conservation. Where possible, they should develop innovative ways to use their private land conservation efforts to work towards addressing the underlying issues. An example is offering land trust properties for use by school groups (Hilts and Reid 1993).

Many of the respondents' comments stressed the need to promote private land conservation efforts with diverse approaches including the media, advertising, public events, and written materials. Public recognition of existing efforts, and sharing information about success stories, are also effective in promoting private land conservation. Some conservation professionals advocated pilot projects to use for motivation, education and promotion. One pilot project currently underway involves a cooperative effort between the Parks Division and the Margaree Environmental Association (Livingston, personal communication). The government is providing scientific data and performing a field study to identify significant ecological features, while the community works together to determine private land conservation strategies and approaches. The results of this pilot project could be significant for promoting private land conservation in the Province. Pilot projects and advertising of success stories can help to create the perception of a social norm around private land conservation. Social norms play a key role in influencing environmental behaviour (McKenzie-Mohr 1996).

6.3.7 The Need For Cooperation and Integration of Efforts

Institutional Integration

Integration of conservation efforts on several levels is essential to effective private land conservation (Beatley 1994; Filyk 1992; Hilts 1989b; Keith 1993). Over 60% of all respondents recommended coordination of conservation efforts, and 80% agreed with recommendations for innovative, cooperative approaches. Specific actions to address the need for coordinating efforts were synthesized from the literature and from landowner comments. First, there is a need for integration and cooperation within government agencies and divisions. Different departments and divisions have their own resource and land management goals, mandates and priorities. Some respondents suggested that forestry and game-related issues predominate provincial priorities and Department of Natural Resources operations. Sixty-seven percent of conservation professionals, felt that an important obstacle to effective private land conservation efforts relates to territorial issues of mandate within different departments and a lack of trust and cooperation between them. The majority of respondents agreed with recommendations to enhance cooperation within agencies. Such recommendations are advocated also in the conservation literature (Carruthers 1989; Edwards and Sharp 1990; Goodier 1986). Senior managers in the government who were interviewed to provide background information, indicated that there is a need for increased cooperation on land management issues. They indicated that there have already been efforts to move in this direction within the Department of Natural Resources. Such coordination could happen through an integrated approach, or through some coordinating mechanism between different government efforts.

Respondents comments also indicated the need for cooperative and integrated efforts between various governments and non-government groups. Some landowners related personal experiences of having more than one agency or organization approach them about their land. This resulted in confusion and frustration for the landowner, and inefficiency and ineffectiveness of the conservation efforts. Even if an integration of all private land conservation interests is not feasible or desired, partnerships between various interests could be significant. The literature supports the need for integration between government and private efforts (Carruthers 1989; Edwards and Sharp 1990; Maynard 1995).

Partnerships can bring unique perspectives to problems, and create motivation and synergism (Filyk 1992). They can also increase the credibility of a particular effort. Partnerships can provide an opportunity to give landowners full benefit of all the advantages of different conservation interests including both non-government organizations and government agencies in protecting their lands (see Table 7). An alternative to partnerships is a coalition of all interest groups, including government and non-government interests on a national, provincial and community scale. Landowners could then be provided with a more holistic and complete information package in the landowner contact work, and efforts would be more efficient and effective. Alternatively, one conservation group could take on primary responsibility for private land conservation efforts in the Province, and they could be responsible for some coordinating mechanism to ensure adequate coordination between different efforts.

Because of the limited resources available in the Province for non-government groups, there are significant challenges in securing funding, technical resources, and expertise. It is therefore important for these groups to cooperate and provide mutual support for each other. Private land conservation coalitions and cooperative approaches have been used successfully in Prince Edward Island (Waddell 1989), and Ontario (Hilts 1989).

Cross-Sector Integration

Some respondents made comments suggesting the need to coordinate all efforts addressing resource and environment issues on private lands including both resource conservation and preservation efforts. This would enable the attainment of common goals and to avoid competition and redundancy. Such coordination is also recommended in the conservation literature (Beatley 1994; Filyk 1992). Other respondents felt that such coordination is not feasible because of the different goals and agendas of different groups resulting in possible incompatibilities, the potential inequities in the influence of certain interests, and a belief that a cooperative effort is not worth the time and energy required. Some respondents stated that power differences between preservation-oriented interests and resource-oriented interests impede cooperative efforts because of fears that resource

conservation interests might dominate at the expense of preservation interests. The literature also agrees with these potential challenges to this type of coordination (Dottavio et al. 1990; Moull 1987).

There is also a need for more integrated efforts in planning and management of lands and resources more generally (Carruthers 1989). Examples include roundtables and other cooperative efforts that focus on overall environmental health and bring together all interest groups and stakeholders such as integrated land management on crown lands, land use working groups, and watershed management planning.

Integration of Scales

As in protected areas system planning, there must be hierarchical integration of efforts on various scales, to ensure adequate representation of significant local, regional and provincial ecological areas and features (National Biodiversity Working Group 1994). The magnitude of privately owned lands in the Province and the small size of many parcels also dictates the need for integrated planning. Such planning is important in determining priorities at each scale and focusing efforts on the most important lands. To add even two percent more land to the protected areas system of the Province would require protection of 100,000 hectares (Milton, personal communication). There should be a provincial level private land conservation strategy, which integrates both local and provincial priorities. This strategy could include the development of an inventory of private land conservation initiatives to enable coordination and to use as examples of successful efforts. Efforts at the provincial level should focus on the development of a strategic framework for private land conservation, including identification of priority areas, and the development of a landowner contact program. Efforts on a local level should focus on gathering public input on an inventory of important lands and features in the community, as well as interested individuals and community leaders and groups who may wish to become involved. They should also focus on providing local landowner contact programs. Focus groups, to explore relevant private land conservation issues further, and the establishment of local private land conservation leaders could also be initiated on a local scale. These latter two efforts have been very successful in other environmental projects (McKenzie-Mohr 1996).

Integration of Approaches

Because of the amount of private land in the Province, it would be a huge effort to protect the thousands of individual parcels of land through landowner contact and voluntary conservation tools. Respondents suggested that there should be diverse and innovative approaches taken to private land conservation efforts, which respond to particular local needs and interests. Over 80% of conservation professionals recommended encouraging innovative approaches to protecting nature on private land. Some conservation professionals made comments recommending continued exploration of other alternatives for protecting private land such as municipal stewardship, zoning, municipal planning, community and regional development. Some conservation professionals also commented on the need for integration of private land conservation concerns into more holistic approaches to land management including watershed planning, roundtables on land use, and community and regional development efforts. Efforts in corporate stewardship must also continue, since corporate interests (particularly the forest industry), own or lease a significant portion of land in the Province.

6.3.8 Important Considerations for the Approach to Private Land Conservation

The Need for a Landowner-centered Approach

The majority of conservation professionals agreed that a lack of consultation and communication with landowners discourages participation in private land conservation. Many landowners, particularly those who were permanent residents on their rural property, commented on the lack of consultation and communication with landowners about issues that affect them and their land directly. Through these comments they indicated that not enough effort had been made to involve them and take advantage of their knowledge, in important land and resource decisions, including the implementation of resource/land programs. Considering that 84% of landowners in Hants County have owned their land for more than 10 years (and many for much longer), and that many live and work on their land and have done so for generations, the amount of knowledge available from these landowners is substantial.

Some landowners stated that they did not feel respected or valued when they were involved in past resource management projects. Many landowners resented dealing with field staff who had no personal experience living or working on the land, nor any experience with land issues. They felt that inexperienced people, particularly people from the city, do not understand the real issues from the landowner perspective.

There were also comments about the ineffectiveness of some existing environmental policies and programs, because landowners were not consulted about the issues. They were not provided with enough information to understand the issues and the implications of programs and policies on landowners. There was, for example, confusion about the Environment Act and Department of Fisheries and Oceans guidelines in terms of their implications for certain farming practices.

Over 80% of conservation professionals agreed with recommendations for increased communication with landowners. Such communication was considered vital to the success of private land conservation efforts in other studies (Hilts 1993). Over 70% of all respondents recommended increased landowner consultation in designing programs, options and incentives. To ensure adequate landowner involvement, the central focus of

all efforts must be the landowners, and efforts to recognize, acknowledge and address their needs, interests and concerns, even if these are not the priorities of conservation professionals. Landowners should be respected and commended for their existing knowledge and land management. The literature emphasized the need for genuine and meaningful participation and partnership, not merely consultation (Caza 1993; Herman 1993; Prince Edward Island Department of Environmental Resources 1995; Public Review Committee 1995), and for the conservation process to have integrity and credibility in the eyes of the community (Harvey 1993). Landowners should be provided with many opportunities for involvement in or information about all stages of the planning, development and administration of private land conservation efforts.

To ensure that consultation and communication with landowners is effective, the literature offers several suggestions. First, documentation on standard landowner contact procedures is available and should be followed (Natural Heritage League, undated). Special consideration should be given to the selection and training of staff to ensure that they are knowledgeable about environmental issues, the local area, and landowners. They should be supportive, sensitive and sympathetic to landowner concerns, needs and interests (Hilts 1993a). The aim of private land conservation efforts should be to build a long term relationship of trust with landowners (Hilts 1993a). The literature also suggests that private land conservation efforts accentuate the positive in emphasizing the owner's generosity and civic-mindedness (Hoose 1991). Regular communication with participants, such as through a newsletter, is also recommended (Hilts 1991a).

The literature suggests that ultimately, landowners wonder what they have to give up for private land conservation, what will be involved, why they should be involved and the relevance for their own life (Comozzi 1991). Therefore, there should be a local context for efforts, including personal site visits, working together with local communities, tapping local knowledge and establishing local support. A local context, and encouragement of a local sense of pride in a conservation effort, is recognized as an important element in building support for conservation in rural areas (Atkinson 1986). Landowner comments about the need for involvement of local groups in the private land conservation process points to the need for a community-based approach. The literature suggests that a

community-based approach can help build a sense of community responsibility (Herman 1993). Locally based efforts are often more successful because local people are more likely concerned with conservation interests of local significance than are distant governments (Hobbs et al. 1993).

The results suggest that to enhance the approach taken to private land conservation efforts, conservation professionals must keep in mind that there are at least two distinct groups of landowners: those who are involved in private land conservation or other conservation efforts, and other rural landowners who represent the majority of the Provinces' landowners. These groups were very distinct in their concerns, priorities, interests and needs. There is also variation in the feasibility and ease with which these different groups become involved in private land conservation. Considering these differences, there may need for completely different approaches to deal with the different groups. Conservation tools and institutional arrangements and incentives must be designed to fit landowner needs and interests. The study also demonstrated the varying viewpoints held by various conservation professionals. Conservation efforts must integrate all of these diverse concerns if all relevant issues are to be addressed.

Other important considerations for the approach to private land conservation recommended in the literature include ensuring that there is flexibility and ongoing monitoring and modification of programs, techniques and conservation tools as required (MacDonald 1990). Finally, the process involved in private land conservation efforts should be dynamic, flexible and responsive to current situations (McKenzie-Mohr 1996). Pilot testing of educational materials and approaches, conservation tools, and incentives, for example, could be used to modify major efforts.

7. CHAPTER SEVEN: CONCLUSIONS

Private land conservation is an integral part of the combined efforts needed to ensure that natural heritage is protected in perpetuity, and that we meet our provincial conservation goals. This study suggests that the necessary landowner support exists to build a private land conservation effort. The majority of landowners in this study expressed concern about the future of the natural environment in Nova Scotia and recognition of the importance of private lands in the overall conservation picture. They supported efforts to encourage stewardship of all private lands and the preservation of ecologically significant private lands. Some landowners, however, may not be willing or able to participate in private land conservation because of the issues identified in this study. My study also identified possible actions that could be taken to address these main issues.

The research was unique in that it is, to date, the only research related to private land conservation carried out in Nova Scotia, and it provides a case study specific to this context. It was unique in that I integrated all the variables identified in previous studies to provide a more holistic picture of private land conservation issues and needs in the Province. My research builds upon existing literature in that my results reconfirm some of the findings, and differ from others. It is the only study to provide an empirical analysis of the perspectives of conservation professionals related to private land conservation, and to integrate their perspectives with those of both a random sample of landowners, and a sample of landowners involved in private land conservation in some way. I also studied several variables that had not been examined previously including: attitudes and knowledge specific to private land conservation, landowners' perspectives on disincentives to participation, and recommendations for enhancing private land conservation, and conservation professionals' perspectives of challenges facing private land conservation. The study provides empirical support for ideas proposed in the literature. It also provides empirical support for some of the recommendations made in other reports in Nova Scotia, including the need for landowner education, amendments to federal income and provincial property tax legislation that impedes private land conservation efforts, and increased cooperation and coordination of private land conservation efforts.

Because of the quantity of information collected in my survey, I focused the discussion on the results that I considered most relevant to enhancing private land conservation in Nova Scotia. The results include many other details that may have potential applications for people interested in private land conservation. My study, for example, provides insight into the landowners already involved in private land conservation, and those who represent landowners who are likely to be targets of future private land conservation efforts. The results include details about these landowners and the variables influencing their attitudes and behaviour, which could be used for targeting and marketing private land conservation efforts, and personalizing these efforts.

Although all of the issues and recommended actions identified in my research may be important in addressing private land conservation issues in Nova Scotia, several can be prioritized based on the strength of the responses in the study, the necessary sequence and timing of the actions, and the feasibility of the actions in the current political and economic climate in the Province. The most pressing and significant issues identified in my research are:

A. The Lack of Information on Private Lands of Conservation Value

B. The Lack of Adequate and Appropriate Supporting Mechanisms for Private Land Conservation Efforts

- Funding
- Incentives
- Institutional options
- Conservation tools
- Training for conservation professionals

C. The Need for Educational Efforts

- Education for landowners to address attitudes and conservation knowledge
- Public education and promotion to increase social, political, legal and economic support for private land conservation

D. The Need for an Appropriate Approach to Private Land Conservation Efforts

- Coordination and integration of private land conservation efforts
- A Landowner-centered and community-based approach

A. ACTIONS TO ADDRESS INFORMATION NEEDS

Both the government and private conservation groups should prioritize the gathering of necessary data about significant private lands, to enable the planning and administration of effective private land conservation efforts.

The Department of Natural Resources has conducted field studies to identify significant areas on crown lands in need of protection. Similar efforts should now be made to collect information on private lands. At the same time, since there may be a significant lack of trust of government in the Province, a private conservation group should organize an effort to collect local knowledge through relevant community-based groups. This information should then be integrated into a common data base including all significant features of conservation value on private lands, the ownership of the lands, the natural landscapes of the province, and existing protected areas. Some of this data is currently being gathered and collated in Geographic Information System (GIS) format by various government departments. It should be a priority project for the Department of Natural Resources (possibly the Parks Division as part of its mandate under the Parks and Protected Areas Systems Plan). Once gathered and synthesized, the information should then be made available to the relevant conservation interests, to establish priorities and to develop a provincial private land conservation strategy.

B. ACTIONS TO PROVIDE SUPPORTING MECHANISMS

The second priority suggested by this research is to put in place all the necessary mechanisms to support private land conservation efforts, including funding, incentives, institutional options, conservation tools and training opportunities for conservation professionals.

There must be adequate funding for private land conservation, through partnerships between government and private groups, and through a major fund-raising campaign initiated by private conservation groups. To reduce costs to private conservation groups, and therefore to decrease the funding required, changes should be made to property tax legislation in the Province (the Assessment Act). These changes should ensure that municipalities exercise their option to provide tax exemptions to conservation groups holding lands for conservation purposes.

To address economic obstacles facing landowners, both government and private conservation groups should work together to develop and implement a targeted incentive program, including education, social and financial incentives. The most important financial incentives are income and property tax breaks, as well as cost sharing opportunities. Federal and Provincial tax legislation (the Income Tax Act and the Provincial Assessment Act) should be amended to enable the appropriate income and property tax breaks. Conservation groups and agencies should also explore opportunities for cost sharing in private land conservation efforts, such as providing legal and survey services or technical advice for participating landowners. The most important disincentive to private land conservation that should be addressed is landowner concern about liability issues. Provincial liability legislation (the Liability Act) should be reviewed and amended if necessary to address these concerns.

There must be a range of institutions available for landowners, including government and non-government options on the national, provincial and local level. To encourage the development of more community-level options, private conservation groups should develop a network to provide the necessary support, information, advice and access to resources

for these new efforts. Recommended resources to assist in such efforts are included in Appendix 7.

The provincial government and private conservation groups should ensure that a variety of conservation tools are made available in the province. These tools should be standardized and streamlined to ensure that they are accessible, efficient and easy to use. Priority should be placed on written agreements, conservation easements and rights of first refusal agreements. There should be a range of options including stewardship as well as preservation-oriented agreements, and there should be flexible and short-term agreements as well as permanent ones.

Finally, the Department of Natural Resources should coordinate training opportunities for conservation professionals and access to resources on providing programs and services. Private conservation groups should also organize their own training and resource-building opportunities, and work cooperatively in these efforts with other private interests.

C. ACTIONS TO ADDRESS EDUCATION AND PROMOTION NEEDS

Both the Provincial Government and private conservation groups should initiate educational efforts aimed at landowners, the general public and relevant government decision-makers.

There should be a landowner contact program at both the provincial level and on a more local scale. The study results suggested that this type of program should be the responsibility of non-government groups. The results also suggested that educational efforts should be targeted for specific landowner groups. Both the content and the educational approach should be appropriate for landowner needs, interests and concerns. Educational efforts should address both knowledge and attitude-related issues. They should provide alternatives to printed materials, including one-on-one interviews, public meetings, contact with local community groups and publicity events.

Both the government and private conservation groups should organize and initiate a provincial level promotional effort to increase awareness of private land conservation, and to increase social, economic, political and legal support for private land conservation efforts. Promotional efforts should include advertising, model projects and public recognition of existing efforts and success stories to inform and motivate the general public. Special educational efforts should be designed for government agencies and other decision-makers whose actions influence private land conservation.

RECOMMENDED APPROACH TO CONSERVATION EFFORTS

All types and levels of private land conservation efforts should be coordinated and integrated. All private land conservation efforts should be landowner-centered and community-based.

Private land conservation efforts should be coordinated and integrated on an institutional level, within government agencies, between government and non-government groups, and between the various non-government groups. Different types of private land conservation efforts (such as resource-conservation and preservation efforts), should be coordinated as well as different approaches to protecting nature on private land (such as land use planning tools and corporate stewardship), and different scales of planning and administration of conservation efforts (local and provincial). There should be a coalition of all interest groups, or at least some coordinating mechanism between the various interest groups. This central or coordinating body could bring together the broad range of interests and ensure that efforts are not conflicting or overlapping with each other. Such a body could also develop and implement a provincial private land conservation strategy, coordinate private land conservation efforts and plans on the various scales, and provide networking opportunities.

The approach used in all aspects of private land conservation efforts should be landowner-centered and community-based. Conservation efforts should provide opportunities for genuine landowner involvement in all aspects of private land conservation, and regular communication with interested landowners. It should ensure respect and recognition of landowners, and their own knowledge and experience on the land. The approach must also recognize the distinct needs, interests and concerns of some of the different landowner groups identified in this research. Finally, private land conservation efforts should aim to work on a community level as much as possible, and to provide opportunities for the involvement of a range of local interests.

7.1 Further Research

There are several research needs suggested by the results of my study that would further private land conservation efforts in Nova Scotia. The first need is for research that involves working with local community groups and landowners to determine appropriate strategies for providing education about private land conservation for rural landowners. Strategies must be found that are sensitive to the needs and concerns raised in my study. The recent research on community-based social marketing may be very applicable to private land conservation efforts (see McKenzie-Mohr 1996 and Kassirer 1996).

Another priority is for further research to field test the findings of my study. Preferably, this research could be done in conjunction with a pilot landowner contact program, and the overall approach could be modified as necessary. Further study could help to confirm priorities amongst the various issues. Alternative methods of exploring private land conservation issues further could also be explored, such as focus groups and specific studies focusing on particular issues to be addressed (e.g. conservation tools, or incentives).

The 23% of private lands that are under corporate ownership in Nova Scotia require very different private land conservation approaches than those addressed in this research. There is a need for research on the issues influencing this type of private land conservation, and the recommended approaches to addressing these issues. At the same time, there is a need to explore other alternative approaches to protecting nature on private lands, such as through regional development projects, watershed planning, integrated resource management and land use planning.

There is also a need for research on the economic rationale for private land conservation. This information could then be used in securing public funds for private land conservation efforts. Although there may be little private land conservation professionals can do to address the broader socio-economic, policy and land/resource use issues impacting private land conservation efforts, the connections between these issues and private land conservation should be explored further. Such research should aim to provide

recommended actions that could be taken to mitigate negative impacts and to enhance positive influences on private land conservation.

Finally, the results of my research were aimed at assessing overall issues facing private land conservation in the Province, based on a case study in an area where there have been minimal private land conservation efforts. Research based on specific case studies of private land conservation efforts underway in Nova Scotia would enrich my findings. Examples of potential case studies include the Kingsburg Coastal Conservancy, the Margaree Environmental Association, the Nature Conservancy of Canada (Atlantic) or the Nova Scotia Nature Trust.

7.2 Concluding Remarks

With a conscientious effort and cooperative spirit, and an effort to recognize and address the issues identified in my research, I believe that private land conservation has immense potential in Nova Scotia. In some ways, we are in an ideal position for developing such an effort because organized private land conservation is a relatively new concept here. We have the opportunity to approach our efforts pro-actively, with the benefit of adequate background information and direction.

Initiating a concerted private land conservation effort in the Province offers an opportunity for cooperative efforts between conservation professionals, landowners and other interested individuals. Such cooperative efforts can be more sensitive to local needs, and are more likely to be supported by a broad range of Nova Scotians. The educational and hands-on approach of private land conservation also provides an important opportunity to develop a conservation ethic in our communities, so that we recognize the importance of nature, the impacts of our actions on its sustainability, and our role as stewards of the natural world, including our own private lands.

8. APPENDIX 1: SURVEY CORRESPONDENCE

School for Resource and
Environmental Studies
Dalhousie University
1312 Robie Street
Halifax, NS
B3H 3E2

12/12/96

Dear John:

I am a graduate student in Environmental Studies at Dalhousie University, and I am doing research on private land conservation in Nova Scotia. Part of my research involves a study of landowners and other people involved in or with an interest in private land conservation. The study aims to find out attitudes, concerns and issues which may create obstacles to such conservation in Nova Scotia and to find ways of enhancing private land conservation and supporting interested landowners.

Your participation in this study is important and would be greatly appreciated. It would involve meeting with me for about one hour to answer questions and share your ideas and opinions about nature conservation and private land. I have enclosed a copy of the interview questionnaire. We could go through the questionnaire together during the interview. Or, if you would prefer, you could fill in the questionnaire on your own time, and I will arrange to pick it up and answer any questions or concerns. I will telephone you in a few days to schedule a convenient time for us to meet if you are interested.

Since I am only selecting a small number of landowners for this survey, the results are only meaningful and useful if people like you respond. Your opinions are important, whether favourable or unfavourable about conservation, and whether or not you have had any experience with conservation. Your responses will be kept strictly confidential and anonymous.

Thank you in advance for your participation.

Sincerely,

Bonnie Sutherland

9. APPENDIX 2: TABLES OF RELATED STUDIES

Table 31: Studies on Attitudes About Conservation

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
A.E.C.	1982	<ul style="list-style-type: none"> • Farmers were less appreciative of wetlands and less likely to favour their protection than non-farmers • Small wetland owners and college-educated owners were more likely to see wetland protection as important and to value wetlands
*Bretchtl et al.	1987	<ul style="list-style-type: none"> • Landowner attitudes are important in private land conservation
Brusnyk et al.	1990	<ul style="list-style-type: none"> • There was a relationship between positive attitudes towards the environment, greater support for nature conservation, a higher degree of concern about wildlife, and participation in non-consumptive recreation, and participation in private land conservation
*Cutting and Cocklin	1992	<ul style="list-style-type: none"> • There is a need for greater understanding of landowner attitudes to conservation (effects success of program) • There is disparity in findings in terms of degree of conservation ethic present, environmental attitudes and priority issues • There are negative attitudes and antipathy towards conservation
Farris	1981	<ul style="list-style-type: none"> • Landowners are unaware of the values of their land for wildlife
Fortman and Kusel	1990	<ul style="list-style-type: none"> • New residents provide a new voice for existing beliefs not new attitudes • Some studies indicate conflict between commodity use views of rural residents and preservation-oriented views of new residents
Haymond	1990	<ul style="list-style-type: none"> • Landowner attitudes are important to private land conservation • There was a correlation between wildlife enhancement management practices used and the professed importance of hunting
Hilts	1984	<ul style="list-style-type: none"> • Knowing the position of the landowner enables agencies to set priorities for resources and funds
Hilts	1993a	<ul style="list-style-type: none"> • Many non-participant landowners were still considered quite "conservation-minded" but not interested in a formal commitment for conservation
Kellert	1981a	<ul style="list-style-type: none"> • Attitudes ranged on a continuum from negative to dominionistic, neutralistic, ecologicistic, aesthetic and utilitarian • Such diverse attitudes affect the feasibility and likelihood of success of conservation efforts, and the need for particular approaches to conservation • Many landowners (particularly large rural landowners) are limited to utilitarian values and dominionistic, and do not appreciate other potential values including more ecological, scientific and aesthetic.
Kreutzwiser and Pietraszko	1986	<ul style="list-style-type: none"> • Landowners placed a higher than anticipated value on resources and nature conservation
Mitchell and Labaree	1991	<ul style="list-style-type: none"> • People in the Atlantic region have the highest degree of public concern toward environment relative to other regions
Morgan	1985	<ul style="list-style-type: none"> • Most landowners showed concern about the land they farm • Many landowners were forced by economics to do harm to their land

(Table 31 continued)

Moull	1987	● There is generally a positive attitude towards private land conservation
*Munro	1989	<ul style="list-style-type: none"> • There are attitudes in the general public working against conservation including an attitude of dominance over nature, and a lack of general environmental awareness • Some people believe that there is plenty of wilderness and biodiversity already protected, a philosophy of human dominance over nature, and the problem of conservation being more of a "motherhood issue" than an ongoing concern
Russell and Eskowich	1989	<ul style="list-style-type: none"> • In non-cultivated areas attitudes and wildlife interests were important influences on participation in conservation
Scenic Hudson Inc.	1986	<ul style="list-style-type: none"> • Landowners were anxious to maintain open space characteristics of their land
Ungar	1994	<ul style="list-style-type: none"> • Attitudes do not successfully predict actual environmentally related behaviour
Van Patter et al.	1990	<ul style="list-style-type: none"> • Landowners placed a higher than anticipated value on resources and nature conservation • Most landowners supported conservation
*Waddell	1990	<ul style="list-style-type: none"> • Landowners generally support conservation

* indicates a non-empirical study

Table 32: Studies on Knowledge of Conservation

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
Arcury et al.	1986	<ul style="list-style-type: none"> • Knowledge about conservation affects attitudes • Knowledge about the environment was generally low
Brusnyk et al.	1990	<ul style="list-style-type: none"> • Landowners were unaware of the environmental problems on their land
C.W.S. et al.	1993	<ul style="list-style-type: none"> • Nova Scotians have a high level of awareness about wildlife issues relative to citizens of other parts of Canada
Farris	1981	<ul style="list-style-type: none"> • Landowners were largely unaware of the value of their land for wildlife and the environmental problems on their land
Gobster and Dickhut	1988	<ul style="list-style-type: none"> • Problem salience (knowledge about the problem and sympathy) was an important influence on participation in conservation activities
*Griffin	1991	<ul style="list-style-type: none"> • Landowner education, and education of children are important
Hilts	1989a 1993a	<ul style="list-style-type: none"> • Landowners were quite knowledgeable about conservation issues
Kellert	1981	<ul style="list-style-type: none"> • There is limited public awareness of wildlife and natural environment values • The public was only aware of obvious utilitarian values of nature, and not other values including ecological, "scientific," aesthetic, moralistic and humanistic
Kreutzwiser and Pietraszko	1986	<ul style="list-style-type: none"> • Landowner knowledge about conservation was low • Many wetland owners were unable to give a particular reason for the value of wetlands, and few could suggest even one value related to wildlife or water resources
Lichtenberg and Lessley	1992	<ul style="list-style-type: none"> • Knowledge is important • Education is important to increase conservation knowledge • Landowners were largely unaware of the value of their land for wildlife and the environmental problems on their land
*Mitchell and Labaree	1991	<ul style="list-style-type: none"> • There is a lack of knowledge about landowner contacts and programs
*O'Connell and Noss	1992	<ul style="list-style-type: none"> • There is a lack of information for landowners on management for conservation and options for protection • There may be a lack of adequate and appropriate information and advice for landowners
Smutko	1986	<ul style="list-style-type: none"> • There was a lack of knowledge about wetland values • Landowners need more information about programs
Wellstead and Brown	1993	<ul style="list-style-type: none"> • Knowledge about resource programs for landowners was higher for larger landowners and lower for less educated or retired landowners • Knowledge was linked with intent to manage private woodlot

* indicates a non-empirical study

Table 33: Studies on Landowner Concerns

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
*Beatley	1994	<ul style="list-style-type: none"> Landowners fear that conservation interferes with land uses and livelihood Landowners are concerned about restrictions causing low land values, and private property rights issues
*Cutting and Cocklin	1992	<ul style="list-style-type: none"> Landowners claim absolute dominion over their land
*Cox	1995	<ul style="list-style-type: none"> Landowners holding to their rights even more in response to perceived loss of rights and increased restrictions
*Evans	1992	<ul style="list-style-type: none"> Landowner attitudes about their rights and responsibilities is an important variable in private land conservation issues
*Filyk	1992	<ul style="list-style-type: none"> Landowner attitudes about their rights and responsibilities is an important variable in conservation issues
*Hamilton and Baxter	1977	<ul style="list-style-type: none"> Many landowners hold tenaciously to the view of rights of dominion over their own land
Kellert	1981b	<ul style="list-style-type: none"> We need to understand landowner concerns
*Lacey et al.	1988	<ul style="list-style-type: none"> Landowners fear negative consequences of private land conservation such as damages from trespassing and liability
*Land Resource Group	1990	<ul style="list-style-type: none"> Relevant land use trends: rapid acquisition of recreational land by non-residents, inflated land prices so locals cannot buy, Government support for non-resident land ownership, and close relationship with big corporations has created distrust These trends led landowners to jealously protect own private property rights and to guard their right to sell to whoever they wish, whenever they wish
*Large	1973	<ul style="list-style-type: none"> People are increasingly viewing land as private property
Morgan	1985	<ul style="list-style-type: none"> Concern about time commitments for agreements Prevalence of other priorities for landowners
Samdahl and Robertson 1989	1989	<ul style="list-style-type: none"> Dominant social values including private property rights were negatively correlated to environmental concern
*Wildlife Advisory Council	1993	<ul style="list-style-type: none"> Landowner concerns are an inability to protect private land from trespass, damages, danger, disturbance and liability

* indicates a non-empirical study

Table 34: Studies Related to Conservation Tools

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
A.E.C.	1982	<ul style="list-style-type: none"> • Landowners preferred advisory services, lower taxes and education • College-educated owners were more apt to support various strategies and to support wetland protection • Farmers were more resistant to outside involvement, and less appreciative of wetlands and their protection • There are relationships between occupation and preferences
Bourke and Luloff	1994	<ul style="list-style-type: none"> • Socio-demographics, use of the forest and ownership status had little influence on attitudes towards private forest land management approaches
Cockerham and Blevins	1977	<ul style="list-style-type: none"> • Newer residents generally supported legal government control • Older residents and large landowners favoured landowner control • The size of property owned influenced strategies preferred
Cutting and Cocklin	1992	<ul style="list-style-type: none"> • Strategies provided may limit or bias participation • Landowner preferences for strategies vary • Little is known about landowner preferences
Gobster and Dickhut	1988	<ul style="list-style-type: none"> • Moderate acceptance for sale of development rights or donating easements • Least preferred option was donation • High acceptance of land use controls (61%), then rights of first refusal • Less acceptance of strategies as landowners reach closer to retirement age • Willingness to accept strategies increased with length of land ownership • Gender, education, income, place of upbringing, and number of acres owned were not significant in predicting acceptance of strategies • Acceptance of strategies varies with perceived importance of tax deduction and other non-monetary benefits, education and income • Younger farmers with smaller farms and more education were more willing to innovate and adopt conservation farming practices • There is a critical gap in knowledge of landowner acceptance of various tools
Hilts	1989 1991a	<ul style="list-style-type: none"> • Least restricting methods are preferred particularly volunteer options with the least government interference • Landowner support and involvement decrease with increasing cost and commitment
*Hilts et al.	1991	<ul style="list-style-type: none"> • Leasing is familiar to farmers and potentially valuable for conservation • Characteristics of typical people donating easements are: over 50, fairly well-off (with income other than land), love for the land is primary motivation factor, able to use tax advantages, non-resident owners, accustomed to land use restrictions

(Table 34 continued)

Kreutzwiser and Pietraszko	1986	<ul style="list-style-type: none"> • Least restricting methods are preferred-particularly volunteer options with the least government interference • High level of agreement between respondents about strategies • Clear separation between most and least preferred strategies • Difference in perception of power of each option and preferences • Occupation is related to acceptance of conservation strategies (especially for farmers/non-farmers) • Preferences for conservation strategies and incentives vary with land base characteristics including predominant land uses, proportion of the property in a natural state and previous conversion of natural areas • Preferred options were advisory programs and property tax incentives
Melinchuck	1987	<ul style="list-style-type: none"> • Landowners preferred financial and program incentives including leases
Morgan	1985	<ul style="list-style-type: none"> • Landowner preferences vary between regions • Landowners favoured property tax breaks (73%), lease (56%), paid easements • Limited support for outright purchase, easements
Moull	1987	<ul style="list-style-type: none"> • Many landowners were interested in stewardship awards, a small number wanted management assistance, then conservation easement, donation and sale • Young farmers were the least receptive to voluntary protection since they have highest liabilities and need stronger compensation
Scenic Hudson	1986	<ul style="list-style-type: none"> • 33% of landowners preferred rights of first refusal, 33% preferred sale of easement and 20% preferred donation of easements • Landowners were interested in preserving land for a variety of conservation, financial and family reasons
Van Patter et al.	1990	<ul style="list-style-type: none"> • Least restricting methods were preferred-particularly volunteer options with the least government interference • Landowners reacted negatively to legal options and would require stronger incentives to participate in them • There is a need to be flexible with options
*Waddell	1990	<ul style="list-style-type: none"> • Least restricting methods were preferred-particularly volunteer options with the least government interference • Verbal agreements are popular

*indicates a non-empirical study

Table 35: Studies Related to Institutional Arrangements

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
A.E.C.	1982	<ul style="list-style-type: none"> • Overall, there was support for landowners, private organizations and all levels of government • College-educated owners were more likely to favour government involvement • Farmers are more resistant to any outside involvement in wetland protection, particularly at state and federal levels • Small wetland owners are more favourably disposed to government involvement in protection
*Edwards and Sharp	1990	<ul style="list-style-type: none"> • Inappropriate arrangements and institutional rigidity can create obstacles to participation and bias participation to certain groups
*Elfring	1989	<ul style="list-style-type: none"> • Some landowners have a negative view of trusts and perceive elitism
Gobster and Dickhut	1988	<ul style="list-style-type: none"> • Participation is influenced by who contacts the landowners and provides information
Kellert	1981a	<ul style="list-style-type: none"> • Many resource managers do not represent landowners well, they do not work to understand landowner objectives and environmental interests, and they do not communicate well with them • More research is needed on landowner attitudes
Kreutzwiser and Pietraszko	1986	<ul style="list-style-type: none"> • Perceptions of effectiveness of various institutional arrangements differ from preferences • Preferences for conservation strategies and incentives vary with land base characteristics including predominant land uses, proportion of the property in a natural state and previous conversion of natural areas • Non-farm respondents favoured federal involvement • Landowners with college education favour regional conservation authorities • Landowners with small properties favoured provincial government
Mitchell and Labaree	1991	<ul style="list-style-type: none"> • Staff turnover and skill, time/effort/frustration in cooperative ventures, and lack of organizations to coordinate stewardship can inhibit private land conservation efforts • Some landowners distrust government, private land trusts or groups from outside community • There are obstacles related to the commitment, attitudes, capability, and knowledge of agency staff
Morgan	1985	<ul style="list-style-type: none"> • Local advisors are needed • Inter-agency cooperation is needed
Moull	1987	<ul style="list-style-type: none"> • There is a lack of long-term commitment and concerns about permanence of programs • There is a lack of coordination and planning can inhibit conservation
Scenic Hudson	1986	<ul style="list-style-type: none"> • Landowners prefer a combination of landowners and non-profits or the local town

*indicates a non-empirical study

Table 36: Studies on Personal Characteristics of Landowners and Private Land Conservation

<i>Author</i>	<i>Date</i>	<i>Variables</i>	<i>Major Findings</i>
A.E.C.	1982	Education Occupation	<ul style="list-style-type: none"> • College-educated owners were more apt to support various strategies and to support wetland protection • Farmers were more resistant to outside involvement, and less appreciative of wetlands and their protection • There are relationships between occupation and preferences
Bardecki	1984	Socio-demographics	<ul style="list-style-type: none"> • Landowner characteristics are associated with preferences for and acceptance of conservation strategies/incentives
Bourke and Luloff	1994	Socio-demographics	<ul style="list-style-type: none"> • Socio-demographics, use of the forest and ownership status had little influence on attitudes towards private forest land management approaches
Brusnyk et al.	1990	Education Income Off-farm employment	<ul style="list-style-type: none"> • Landowners who participate in private land conservation programs tended to be better educated, to have higher net income levels and more family employed off the farm
Cockerham and Blevins	1977	Years of ownership	<ul style="list-style-type: none"> • Newer residents generally supported legal government control • Older residents and large landowners favoured landowner control
Featherstone and Goodwin	1993	Age	<ul style="list-style-type: none"> • Older people invest less in conservation
Gobster and Dickhut	1988	Age Education Income	<ul style="list-style-type: none"> • Less acceptance of strategies as landowners reach closer to retirement age • Acceptance of strategies varies with education and income • Younger farmers with more education were more willing to innovate and adopt conservation farming practices
*Hilts et al.	1991	Age Income Residence	<ul style="list-style-type: none"> • Characteristics of typical people donating easements are: over 50, fairly well-off (with income other than land), love for the land is primary motivation factor, able to use tax advantages, non- resident owners, and accustomed to land use restrictions
Kreutzwiser and Pietraszko	1986	Occupation	<ul style="list-style-type: none"> • Occupation influences participation in private land conservation and acceptance of conservation strategies (especially for farmers/non-farmers)
Moull	1987	Age Occupation	<ul style="list-style-type: none"> • Young farmers were the least receptive to voluntary protection since they have highest liabilities and need stronger compensation

* indicates a non-empirical study

Table 37: Studies on Personal Characteristics and Environmental Concern

<i>Author</i>	<i>Date</i>	<i>Variables</i>	<i>Major Findings</i>
Arbuthnot	1977	Personality traits Politics	<ul style="list-style-type: none"> • Personality traits associated with environmental orientation are liberal attitudes,, flexible beliefs and less traditional-orientated views
Arcury et al.	1986	Age Education Gender Income Background	<ul style="list-style-type: none"> • Age is inversely related to environmental concern • Socioeconomic status (income and education), gender and ruralness of background are important variables
Arcury	1990	Age Education Background	<ul style="list-style-type: none"> • Age is inversely related to environmental concern • Higher education, urban living and being male are related to increased environmental concern
Bourke and Luloff	1984	Socio-demographics	<ul style="list-style-type: none"> • Socio-demographic characteristics, ownership status and management practice were not related to attitudes towards management of private lands for conservation
Buttelli	1979	Age Residence size	<ul style="list-style-type: none"> • Age is inversely related to environmental concern • Size of residence area is related to environmental concern
Buttelli	1979/ 87	Background Politics	<ul style="list-style-type: none"> • Political orientation, and ruralness of background are important variables in environmental concern
Christenson	1978	Ruralness Size residence area	<ul style="list-style-type: none"> • Ruralness of background and size of residence area are important variables in environmental concern
Dunlap	1975	Political orientation	<ul style="list-style-type: none"> • Political orientation is related to environmental concern, but results of other studies are ambiguous
Edgell and Nowell	1989	Ruralness Size of residence area	<ul style="list-style-type: none"> • Ruralness of background and size of residence area are important variables in environmental concern • There are strong utilitarian and less protective attitudes in rural areas
Fortman and Kusel	1990	Education Gender Ruralness	<ul style="list-style-type: none"> • Higher education and gender (women) are related to increased environmental concern • There is no relationship between ruralness and attitudes towards the environment
Mohai and Twight	1987	Education	<ul style="list-style-type: none"> • Higher education is related to increased environmental concern
Mohai and Twight	1992	Gender	<ul style="list-style-type: none"> • Women show higher environmental concern than men but less activism
Rickson and Stabler	1985	Ruralness Size Residence area	<ul style="list-style-type: none"> • Ruralness of background and size of residence area are important variables in environmental concern
Samdahl and Robertson	1989	Political ideology Socio-demographics	<ul style="list-style-type: none"> • Socio-demographic variables are ineffective in explaining environmental concern, other than political ideology (pro-regulatory liberalism)
Schahn and Holzer	1990	Gender	<ul style="list-style-type: none"> • Women show higher environmental concern than men

(Table 37 continued)

Scott and Willit	1994	Age Education Income Politics	<ul style="list-style-type: none"> • Education, age, income and political ideology are all predictive of environmentally oriented behaviour in general
Tremblay and Dunlap	1978	Ruralness Size residence	<ul style="list-style-type: none"> • Ruralness of background and size of residence area are important variables in environmental concern and rural farmers are less concerned
Van Liere and Dunlap	1980/81	Age Education Gender Income Occupation Ruralness Size of residence	<ul style="list-style-type: none"> • Age is inversely related to environmental concern • Education, ruralness of background and size of residence area and gender (women) are important variables influencing environmental concern • Income was ambiguous as an important variable in environmental concern • Occupation was only weakly related to environmental concern • There is a high level of variation in study results about environmental concern

Table 38: Studies on Land Characteristics

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
A.E.C.	1982	<ul style="list-style-type: none"> • Small wetland owners are more favourably disposed to government involvement in protection • Farmers were less appreciative of wetlands and less likely to favour their protection than non-farmers
Bardecki	1984	<ul style="list-style-type: none"> • Preferences for conservation strategies and incentives vary with land base characteristics
Bourke and Luloff	1994	<ul style="list-style-type: none"> • Use of the forest and ownership status had little influence on attitudes towards private forest land management approaches
Cockerham and Blevins	1977	<ul style="list-style-type: none"> • Newer residents generally supported legal government control • Older residents and large landowners favoured landowner control • The size of property owned influenced strategies preferred
Farris	1981	<ul style="list-style-type: none"> • Few practical incentives exist for large economically dependent private landowners for managing lands for wildlife • Farmers receive little economic return for wildlife
Gobster and Dickhut	1988	<ul style="list-style-type: none"> • Willingness to accept strategies increased with length of land ownership • Size of property was not significant in predicting acceptance of strategies • Younger farmers with smaller farms were more willing to innovate and adopt conservation farming practices
*Hilts et al.	1991	<ul style="list-style-type: none"> • Leasing is familiar to farmers and potentially valuable for conservation • Characteristics of typical people donating easements are: Income other than from the land, non- resident owners
Kellert	1981a	<ul style="list-style-type: none"> • Many landowners (particularly large rural landowners) are limited to utilitarian values and dominionistic, and do not appreciate other potential values including more ecological, scientific and aesthetic. • Large rural landowners may need practical and economic incentives
Kreutzwiser and Pietraszko	1986	<ul style="list-style-type: none"> • Preferences for conservation strategies and incentives vary with land base characteristics including predominant land uses, proportion of the property in a natural state and previous conversion of natural areas • Non-farm respondents favoured federal involvement • Landowners with small properties favoured provincial government
Russell and Eskowich	1989	<ul style="list-style-type: none"> • Economic incentives were most important in rural areas • In non-cultivated areas, attitudes and interest in wildlife were more important determinants of participation • The need for incentives depends on land base characteristics
Van Patter et al.	1990	<ul style="list-style-type: none"> • Financial incentives were preferred by landowners already considering converting their natural areas
Wellstead and Brown	1993	<ul style="list-style-type: none"> • Knowledge about resource programs for landowners was higher for larger landowners and lower for less educated or retired landowners

* indicates a non-empirical study

Table 39: Studies on Participation in Nature-related Activities

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
Brusnyk et al.	1990	<ul style="list-style-type: none">• Participation in non-consumptive wildlife-related activities was higher among those landowners participating in private land conservation than for non-participants
Dunlap and Heffernan	1975	<ul style="list-style-type: none">• Environmental concern is associated with appreciative rather than consumptive or mechanized recreational activities
Geisler et al.	1977	<ul style="list-style-type: none">• The theory that environmental concern is more highly associated with “appreciative” rather than with “consumptive” recreational activities is questioned
Haymond	1990	<ul style="list-style-type: none">• There is a correlation between wildlife enhancement management practices used and the professed importance of hunting
Jackson	1986	<ul style="list-style-type: none">• Environmental concern is more highly associated with “appreciative” rather than with “consumptive” or “mechanized” recreational activities

Table 40: Studies on Incentives for Conservation

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
Bardecki	1984	<ul style="list-style-type: none"> • Preferences for conservation strategies and incentives vary with land base characteristics and personal characteristics
Brusnyk et al.	1990	<ul style="list-style-type: none"> • Landowner preferences for incentives varied • Incentives are an important influence on participation • Participants considered incentives less important than non-participants
Farris	1981	<ul style="list-style-type: none"> • Few practical incentives exist for large economically dependent private landowners for managing lands for wildlife • Farmers receive little economic return for wildlife
Kellert	1981	<ul style="list-style-type: none"> • Large rural landowners may need practical and economic incentives more than others • Limitation of public awareness of wildlife and natural environment values
*Maynard	1995	<ul style="list-style-type: none"> • There is a need for financial incentives and technical advice
*MacDonald	1990	<ul style="list-style-type: none"> • The appropriateness of using an incentive for a particular situation must be determined based on landowner preferences, and the strength of protection provided by the proposed strategy
Melinchuck	1987	<ul style="list-style-type: none"> • Landowner preferences for incentives varied • Incentives are an important influence on participation • Landowners preferred incentives as the strategy for increasing their participation
*Mitchell and Labaree	1991	<ul style="list-style-type: none"> • There is a lack of tax and financial incentives for private land conservation
Russell and Eskowich	1989	<ul style="list-style-type: none"> • Economic incentives were most important in rural areas • In non-cultivated areas, attitudes and interest in wildlife were more important determinants of participation • The need for incentives depends on characteristics of the land base and landowner attitude
Shelton	1981	<ul style="list-style-type: none"> • There is a need for incentives including recognition, cost-sharing and financial incentives, liability relief and tax benefits
Smutko	1986	<ul style="list-style-type: none"> • Landowner preferences for incentives varied • Incentives are an important influence on participation • A lack of incentives was a concern to non-participants • There was a lack of landowner understanding about incentives
Van Patter et al.	1990	<ul style="list-style-type: none"> • Financial incentives were preferred by landowners already considering converting their natural areas • The more expensive incentives were rated as excessive by many landowners • Landowners reacted negatively to legal options and would require stronger incentives to participate in them
World Resources Institute et al.	1992	<ul style="list-style-type: none"> • International strategies to protect biodiversity call for increasing incentives

* indicates a non-empirical study

Table 41: Studies on Additional Variables

<i>Author</i>	<i>Date</i>	<i>Major Findings</i>
*Caza	1993	<ul style="list-style-type: none"> • Competition from other uses of private lands can be an obstacle • Importance of impacts of policies on land use
*Elfring	1989	<ul style="list-style-type: none"> • There is fear that private land conservation will reduce the tax income to the community
*Mitchell and Labaree	1991	<ul style="list-style-type: none"> • Staff turnover and skill, time/effort/frustration in cooperative ventures, and lack of organizations to coordinate stewardship can inhibit private land conservation efforts • Some landowners distrust government, private land trusts or groups from outside community • There are obstacles related to the commitment, attitudes, capability, and knowledge of agency staff • A lack of appropriate legislation (i.e. easements) can inhibit private land conservation • There is inadequate long term funding and commitment
Morgan	1985	<ul style="list-style-type: none"> • There is concern about time commitments for agreements • There is a prevalence of other priorities for landowners
Moull	1987	<ul style="list-style-type: none"> • There is a of lack long-term commitment • There are concerns about the permanence of programs • Lack of coordination and planning can inhibit conservation
*Munro	1989	<ul style="list-style-type: none"> • There is a lack of integrated planning • There is lack of data and funding for data collection and analysis • There is a lack of adequate funding for conservation • There are resource conflicts and inadequate legislation
Rakowski and Massey	1993	<ul style="list-style-type: none"> • How can interest be converted into effective programs • There are concerns about the permanence of programs
*Rubec	1995	<ul style="list-style-type: none"> • Policy change is needed for effective private land conservation
*Sandberg	1992	<ul style="list-style-type: none"> • The market structure in forestry industry works against conservation

* indicates a non-empirical study

10. APPENDIX 3: FREQUENCY TABLES

Table 42: Frequency Table for Conservation Attitudes

<i>Attitudes</i>		<i>Involved landowners (n=15)</i>					<i>Hunt landowners (n=64)</i>				
		1*	2*	3*	4*	5*	1*	2*	3*	4*	5*
Plants and animals exist mainly to be used by humans	AC1	73	27	0	0	0	28	31	8	27	6
The balance of nature is delicate and easily upset	AC2	7	0	7	47	40	8	2	9	39	42
Humans have the right to change the natural environment to suit their needs	AC3	40	20	33	7	0	25	41	16	16	2
The earth is like a spaceship with only limited room and resources	AC4	0	0	0	33	60	8	9	2	45	33
Humans are severely abusing the environment	AC5	0	0	7	47	47	2	5	5	42	45
We are approaching the maximum number of people the earth can support	AC6	0	20	13	33	27	3	22	31	25	16
I am concerned about the future of the natural environment in Nova Scotia	AC7	0	0	0	20	80	0	8	5	55	32
I think nature conservation is important	AC8	0	0	0	20	80	0	0	2	55	42
I think there are too many restrictions on private landowners due to environmental concerns	AC9	53	27	7	0	7	8	39	23	22	6
Landowners have a right to do what they want with their land	AC10	27	40	7	13	7	3	47	11	31	8
Landowners have a responsibility to take care of their lands to protect nature	AC11	0	0	0	47	53	0	3	3	66	28
How we use our private land affects other people's land	AC12	0	0	0	47	53	2	6	9	55	27
I think private lands are important for effective nature conservation in Nova Scotia	AC13	0	0	13	33	53	0	2	3	72	23
Landowners should be encouraged to manage their resources in a sustainable way so that the resources are available for future generations	AC14	0	0	0	27	73	0	3	0	47	50
Landowners should be encouraged to protect and preserve important natural features on their lands because we have Parks Department on public lands for nature preservation	AC15	7	0	0	13	80	0	3	8	58	31
Landowners should not have to preserve natural areas and special features on their lands because we have Parks Department on public lands for nature preservation	AC16	53	20	0	7	7	13	59	14	9	3

Table 42 continued

I am interested in conservation on my own land if it does not interfere with my use of resources (e.g. woodlot use)	AC17	7	7	7	20	33	0	11	8	67	14
I am interested in practicing conservation on my land strictly for nature's sake, even if it means giving up certain land and resource uses	AC18	0	7	13	27	53	3	42	22	27	5

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 43: Frequency Table for Environmental Concern

<i>Environmental Concern Score</i>	7	11	12	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Involved landowners	7				7		7	7	20	7	33	13							
Hants Landowners		2	2	3	6	2	5	5	3	14	8	8	11	9	8	8	3	5	

(percent of responses on a composite of 5 scores from 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree. Maximum possible score was 30)

Table 44: Frequency Table for Knowledge on Private Land Conservation

<i>Knowledge</i>		<i>Involved landowners (n=15)</i>					<i>Hants landowners (n=64)</i>				
		1*	2*	3*	4*	5*	1*	2*	3*	4*	5*
How to practice conservation	KC1		20	27	27	27	9	30	17	39	5
The science of conservation	KC2	0	13	20	53	13	3	34	17	38	6
Ducks unlimited	KC3	7	20	27	40	7	9	38	14	30	9
Private groups	KC4	7	13	27	40	13	41	39	13	5	2
Government resource programs	KC5	13	13	33	40	0	22	27	14	34	2
Government preservation programs	KC6	7	27	33	27	7	52	22	16	8	0
Alternative for landowners	KC7	0	20	20	27	27	48	25	16	8	2

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 45: Frequency Table for Total Knowledge on Private Land Conservation

<i>Conservation Knowledge Score</i>	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Hants landowners					7	7	7	7					27	7	7	7	13		13
Involved Landowners	2	5	11	5	9	9	9	5	11	9	8	3	6	2		2	2	2	2

(percent of responses on a composite of 7 scores from 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree. Maximum score possible was 35)

Table 46: Frequency Table for Factors Encouraging Participation in Private Land Conservation

<i>Incentives</i>		<i>Involved landowners (n=15)</i>					<i>Hants landowners (n=64)</i>					<i>Professionals (n=39)</i>				
		1*	2*	3*	4*	5*	1*	2*	3*	4*	5*	1*	2*	3*	4*	5*
Protecting land for children	INC1	0	7	7	20	53	0	3	0	31	63	0	8	3	41	49
Family heritage/tradition	INC2	7	20	0	13	27	3	5	6	34	48	3	8	13	51	23
Concern about nature	INC3	0	0	0	13	80	0	0	3	42	50	0	3	5	39	54
Financial incentives	INC4	20	40	7	7	13	14	13	19	31	17	8	13	5	28	46
Other incentives	INC5	33	33	7	13	0	27	20	13	25	8	8	8	23	41	18
Economic security	INC6	33	13	20	13	7	9	6	16	30	34	13	15	13	31	26
Wildlife protection	INC7	0	0	0	20	73	0	5	2	39	53	0	3	5	41	49
Other conservation values	INC8	0	0	0	13	80	0	2	6	33	58	0	5	8	46	39
Feeling of responsibility	INC9	0	0	7	13	73	0	3	8	55	31	0	8	21	18	49
Hunting, fishing and trapping	INC10	60	7	0	0	13	27	23	6	30	11	15	26	21	28	5
Other recreation	INC11	0	27	13	20	20	8	20	6	44	13	5	15	23	46	8
Wildlife viewing	INC12	7	7	7	27	33	5	19	6	45	19	3	21	18	44	13
Natural beauty	INC13	0	0	7	20	67	0	2	5	53	41	0	5	13	51	28
Useful products	INC14	0	7	7	27	47	0	2	3	55	36	10	23	15	31	18
Protection of land in future	INC15	0	7	13	0	67	9	6	11	42	30	0	8	5	36	46
Opportunity to learn	INC16	7	7	7	20	47	6	14	8	50	19	8	21	23	33	13
Community awareness	INC17	7	7	0	27	53	8	11	19	36	22	8	18	18	31	23
Value of land for conservation	INC18	0	13	7	20	40	6	8	17	42	27	3	8	18	39	31
Whether others involved	INC19	7	13	13	20	27	17	8	14	39	19	3	21	21	31	23

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 47: Frequency Table for Disincentives for Private Land Conservation

<i>Disincentives</i>		<i>Involved landowners (n=15)</i>					<i>Hants landowners (n=64)</i>					<i>Professionals (n=39)</i>				
		1*	2*	3*	4*	5*	1*	2*	3*	4*	5*	1*	2*	3*	4*	5*
Need to make money	DIS1	40	33	0	7	13	20	22	5	39	14	5	5	0	44	46
Belief in landowner rights	DIS2	40	7	20	20	7	16	20	6	30	27	8	8	8	26	51
Desire for independence	DIS3	27	13	27	7	13	9	9	5	44	31	5	5	3	36	51
Other priorities	DIS4	40	0	20	13	0	22	14	22	17	5	5	5	49	21	10
Lack of trust of 'government'	DIS5	20	7	13	27	27	11	9	16	17	39	3	0	13	44	41
Not thought about it	DIS6	20	7	13	13	0	9	13	22	27	8	0	0	0	0	0
Lack of time	DIS7	13	20	33	20	0	11	23	14	31	13	5	23	36	31	5
Fear cost vs. benefits	DIS8	40	20	7	13	0	22	30	14	17	11	3	31	23	30	12
Difficulty with family	DIS9	40	13	13	7	0	34	28	11	11	6	3	13	28	54	3
Concern about restrictions	DIS10	33	7	13	40	0	9	16	11	36	25	0	8	10	69	10
Concern about time frame	DIS11	40	13	20	13	0	14	11	13	25	19	0	10	26	49	15
Lack trust of programs	DIS12	13	27	20	27	0	5	14	22	23	23	3	21	23	41	13
Competing incentives	DIS13	47	20	0	7	13	31	22	5	17	9	3	8	13	44	33
Lack of landowner consultation	DIS14	13	13	47	0	13	11	5	20	22	20	3	8	21	46	18
Tax penalties	DIS15	7	13	33	13	20	6	8	20	19	17	0	15	15	26	39
Fear of liability	DIS16	20	20	13	20	20	8	13	5	27	33	10	10	10	44	26
Discontent with options	DIS17	13	7	20	27	13	9	8	22	13	8	0	18	46	28	8
Discontent with programs	DIS18	13	13	20	27	7	9	5	31	6	8	3	13	56	18	10
Lack of knowledge on values	DIS19	0	0	0	0	0	0	0	0	0	0	3	5	15	39	39
Lack knowledge on options	DIS20	0	0	0	0	0	0	0	0	0	0	3	0	5	41	49
Lack of conservation ethic	DIS21	0	0	0	0	0	0	0	0	0	0	8	21	15	41	13
Lack recognition of land value	DIS22	0	0	0	0	0	0	0	0	0	0	0	8	10	49	31
Complexity of agreements	DIS23	0	0	0	0	0	0	0	0	0	0	3	15	36	36	8
Lack of financial incentives	DIS24	0	0	0	0	0	0	0	0	0	0	3	8	10	41	36
Lack of social incentives	DIS25	0	0	0	0	0	0	0	0	0	0	3	23	21	39	13
Lack of educational incentives	DIS26	0	0	0	0	0	0	0	0	0	0	0	5	10	49	33

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 48: Frequency Table for Preferences for Agreement Time Frame

<i>Agreement Time frame</i>		<i>Involved landowners (N=15)</i>	<i>Hants landowners (N=64)</i>
No interest	REC26	0	27
Less than 10 years	REC26	7	36
10 to 25 years	REC26	27	17
Permanent	REC26	53	14

Table 49: Frequency Table for Challenges Facing Private Land Conservation

<i>Challenges</i>		<i>Professionals</i>				
		1*	2*	3*	4*	5*
Lack of data	CHAL1	5	15	10	41	26
Lack of communication	CHAL2	0	3	5	44	46
Varied goals	CHAL3	3	26	18	36	15
Lack of inter-dept. cooperation	CHAL4	5	10	15	31	36
Lack of coordination	CHAL5	3	5	8	54	28
Lack of commitment	CHAL6	3	5	8	46	33
Lack skill and experience	CHAL7	5	13	28	41	10
Lack of program permanency	CHAL8	3	5	23	44	23
Property taxes for groups	CHAL9	5	10	23	28	28
Complexity of agreements	CHAL10	0	26	36	26	10
Lack of common ground	CHAL11	10	15	23	33	15
Lack of legal/policy support	CHAL12	3	15	5	46	21
Lack of scientific knowledge	CHAL13	10	26	21	31	8
Lack of knowledge of options	CHAL14	3	23	13	49	10

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 50: Frequency Table for Preferences for Tools for Private Land Conservation

<i>Tools</i>		<i>Involved landowners</i>					<i>Hants landowners</i>					<i>Professionals</i>				
		1*	2*	3*	4*	5*	1*	2*	3*	4*	5*	1*	2*	3*	4*	5*
Landowner contact	STR1	0	0	7	40	53	2	5	22	48	22	0	3	10	33	54
Handshake agreement	STR2	13	27	33	20	0	23	25	16	30	5	10	36	13	28	10
Written agreement	STR3	7	0	7	60	27	9	11	17	45	13	3	8	8	36	44
Management agreement	STR4	7	13	33	27	20	9	9	22	45	9	0	5	5	46	39
Lease	STR5	7	20	13	33	20	22	25	14	34	3	0	18	8	51	21
Easement	STR6	0	0	20	33	47	14	17	13	42	8	0	5	0	15	74
Sale to group	STR7	7	0	20	33	40	20	31	14	28	3	5	13	8	21	49
Sale to government	STR8	13	13	27	27	20	36	25	13	19	3	15	8	10	28	26
Donation to group	STR9	0	0	20	27	53	20	16	20	36	6	0	3	5	18	72
Donation to government	STR10	13	7	7	47	27	27	25	17	23	2	8	5	8	24	55
Rights of refusal	STR11	0	0	7	53	40	14	11	16	42	9	0	8	8	45	40
Donation in will	STR12	0	0	13	20	67	17	14	19	42	5	0	0	0	21	77
Land use zoning	STR13	7	7	20	27	40	28	25	20	16	8	0	5	8	26	56

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 51: Frequency Table for Recommendations for Private Land Conservation

<i>Recommendations</i>		<i>Involved landowners</i>					<i>Hunts landowners</i>					<i>Professionals</i>				
		1*	2*	3*	4*	5*	1*	2*	3*	4*	5*	1*	2*	3*	4*	5*
Information on values	REC1	0	7	0	13	73	0	2	2	41	56	0	8	5	26	62
Information on benefits	REC2	0	7	0	7	80	0	3	6	47	44	0	3	3	31	64
Information on land value	REC3	0	7	0	20	67	2	3	3	58	34	0	3	0	21	77
Information on management	REC4	0	13	0	20	60	3	2	3	55	38	0	3	10	26	62
Information on options	REC5	0	0	0	20	73	0	2	8	56	34	0	0	3	10	87
Cash incentives	REC6	7	0	47	27	7	8	16	23	38	14	13	23	10	28	26
Small grants	REC7	7	0	20	33	27	8	9	14	44	23	3	8	8	39	41
Property tax breaks	REC8	0	0	0	20	73	2	5	6	48	38	5	3	0	15	77
Income tax breaks	REC9	0	0	7	40	40	0	5	8	52	36	3	3	3	18	74
Large grants	REC10	7	13	33	13	13	19	14	22	30	13	13	18	28	26	13
Cost sharing	REC11	7	7	27	20	27	5	11	13	52	13	8	13	13	44	21
Social incentives	REC12	7	7	7	40	27	13	22	11	36	17	5	8	10	39	39
Incentives matching commitment	REC13	0	7	0	60	20	3	3	17	47	27	5	5	10	39	41
Landowner contact	REC14	0	0	13	27	53	0	3	11	50	31	0	0	5	21	74
Variety of options	REC15	0	0	7	33	53	2	5	8	59	27	0	0	8	23	69
Variety of organizations	REC16	0	7	13	27	40	13	16	22	30	17	8	8	10	36	33
Consultation with landowners	REC17	0	0	13	20	53	0	6	11	47	34	0	0	5	15	77
Easy process	REC18	0	0	7	7	80	2	3	8	44	42	0	5	0	21	74
Knowledgeable advisors	REC19	0	0	7	20	60	3	6	3	45	38	0	3	8	23	67
Information for independence	REC20	0	0	7	13	73	0	3	0	45	50	0	0	3	33	64
Coordination of efforts	REC21	0	0	20	13	60	2	11	23	33	28	0	13	8	39	41
Variety of information approaches	REC22	0	0	0	47	47	3	9	5	61	20	0	8	5	44	44
Commitment by groups	REC23	0	0	0	20	73	8	6	17	41	25	0	3	5	40	53
Other support	REC24	0	7	7	33	47	6	11	23	28	25	0	0	23	26	51
Flexibility in agreements	REC25	0	0	40	33	20	2	5	16	41	27	3	13	18	36	31
Innovative approaches	REC27											3	0	15	41	41
Improved communication	REC28											0	0	13	26	62
Revision of tax law	REC29											3	3	5	21	69
Training and education	REC30											0	5	10	28	51
Government grants for groups	REC31											5	5	21	28	26

(* Measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

11. APPENDIX 4: RELATIONSHIPS BETWEEN VARIABLES

This appendix contains tables of relationships between variables. It includes tables comparing subgroups of respondents on specific variables and also tables of correlations between variables.

Table 52: Relationships Between Conservation Attitudes and Participation Variables

<i>Conservation Attitudes</i>		<i>Involvement in a conservation program</i>	<i>Involvement in nature-oriented activity</i>	<i>Membership in conservation or resource management groups</i>
Nature exists for humans	AC1	7.57 (2)		6.26 (2) (2)
Limited room and resources	AC4	6.66 (2)		
Concerned about NS	AC7		3.78 (1)	3.72 (1)
Too many restrictions	AC9			3.79 (1)
Landowner responsibility	AC11		5.36 (1)	
Use of land effects others	AC12	10.14 (2)		8.83 (2)
Parks are adequate	AC16	8.16 (2)	8.16 (2)	
Environmental concern	EC	8.43 (1)		

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was Kruskal Wallace Test (df)=degrees of freedom

Table 53: Relationships Between Conservation Attitudes and Personal and Land Variables

<i>Conservation Attitudes</i>		<i>Age</i>	<i>Income</i>	<i>Education</i>	<i>Background</i>	<i>Occupation</i>	<i>Property Size</i>	<i>Residence</i>
Right to change environment	AC3	6.49 (1)						
Limited room and resources	AC4		11.66 (3)	11.45 (2)		6.15 (2)		
Concerned about Nova Scotia	A7						7.32 (2)	
Importance of conservation	AC8			5.91 (2)				
Too many restrictions	AC9			6.82 (2)				
Landowner rights	AC10		8.05 (3)					
Landowner responsibility	AC11			10.13 (2)				
Use of land effects others	AC12		11.11 (3)	13.79 (2)	6.63 (1)	16.34 (2)		
Encourage sustainability	AC14			9.52 (2)			5.96 (2)	
Encourage preservation	AC15			6.47 (2)				
Environmental Concern	EC					6.32 (2)		9.50 (2)

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was Kruskal Wallance Test (df)=degrees of freedom

Table 54: Correlations Between Conservation Attitudes and Personal and Land Variables

<i>Conservation Attitudes</i>		<i>Income</i>	<i>Education</i>	<i>Economic Importance of land</i>	<i>Property size</i>	<i>Residence</i>
Limited room and resources	AC4	.392	.331			
Humans abusing environment	AC5				-.228	
Maximum population	AC6	.239				
Concerned about Nova Scotia	AC7		-.283			
Landowner rights	AC10	.225				
Use of land effects others	AC12	.386	.430		-.249	
Encourage sustainability	AC14	.263	.290			
Parks are enough	AC16				-.225	.356
Interested in conservation	AC17			-.2491		

Responses shown indicate a significant correlation ($p < .05$) using Kendall's Correlation

Table 55: Relationships Between Conservation Attitudes and Practices, Knowledge, and Environmental Concern Variables

<i>Conservation Attitudes</i>		<i>Involvement in Conservation practices (Leave natural areas alone for conservation)</i>	<i>Conservation Knowledge</i>	<i>Environmental Concern</i>	<i>Interest in preservation</i>	<i>Interest in stewardship</i>
Balance is delicate	AC2	4.94 (1)		14.82 (1)		
Right to change environment	AC3	5.11 (1)				
Limited room and resources	AC4		9.75 (2)	23.36 (1)		
Humans abusing environment	AC5	4.12 (1)		4.46 (1)	9.37 (4)	
Maximum population	AC6			15.26 (1)		
Too many restrictions	AC9	6.99 (1)				
Landowner responsibility	AC11		7.05 (2)	8.04 (1)	5.78 (2)	
Private lands are important	AC13				14.76 (4)	
Encourage sustainability	AC14				9.99 (4)	
Encourage preservation	AC15				16.80 (4)	
Interested in conservation	AC17				14.87 (4)	
Environmental Concern	EC			4.80 (1)		9.09 (3)

Responses shown indicate significant difference between subgroups for each variable (p<(0.05)
Statistic used was Kruskal Wallace Test (df)=degrees of freedom

Table 56: Relationships Between Conservation Knowledge and Participation Variables

<i>Conservation Knowledge</i>		<i>Membership in Conservation group</i>	<i>Involvement in program</i>	<i>Involvement in nature-related activities</i>
How to practice conservation	KC1	4.50 (1)	3.82 (1)	
Science of conservation	KC2	5.26 (1)		
Ducks unlimited	KC3	6.27 (2)	6.86 (1)	
Private organizations	KC4	8.35 (1)	9.11 (1)	5.12 (1)
Government-resource	KC5		7.52 (1)	
Alternatives for landowners	KC7		5.61 (1)	5.82 (1)
Total conservation knowledge	KC8		10.55 (2)	4.39 (1)

Responses shown indicate significant difference between subgroups for each variable (p<(0.05)
Statistic used was Kruskal Wallace Test (df)=degrees of freedom

Table 57: Relationships Between Conservation Knowledge and Personal, Land and Concern Variables

<i>Conservation Knowledge</i>		<i>Method of Land Acquisition</i>	<i>Education</i>	<i>Environmental Concern</i>
How to practice conservation	KC1	4.19 (1)		
Private organizations	KC4		5.76 (2)	
Government-resource	KC5		6.86 (2)	
Total conservation knowledge	KC8			7.09 (1)

Responses shown indicate significant difference between sub-groups for each variable ($p < 0.05$)

Statistic used was Kruskal Wallace Test (df)=degrees of freedom

Table 58: Correlations Between Conservation Knowledge and Personal and Land Variables

<i>Conservation Knowledge</i>		<i>Age</i>	<i>Income</i>	<i>Education</i>
How to practice conservation	KC1			
Ducks unlimited	KC3	.252	.252	
Private organizations	KC4			.258
Government-resource	KC5			.293
Total conservation knowledge	KC8			.209

Responses shown indicate a significant correlation ($p < .05$) using Kendall's Correlation

Table 60: Relationships Between Perceptions of Incentives and Participation Variables, and Conservation Knowledge

<i>Incentives</i>		<i>Involvement in nature-related activities</i>	<i>Membership in Conservation group</i>	<i>Involvement in program</i>	<i>Interest in preservation</i>	<i>Conservation knowledge</i>	<i>Conservation Practices (leave areas for conservation purposes)</i>
Financial incentives	INC4			4.70 (1)			
Other incentives	INC5		4.05 (1)				
Wildlife protection	INC7	13.09 (2)					
Providing fishing/hunting	INC10	10.86 (2)			10.50 (4)		
Providing other recreation	INC11	11.73 (2)					
Wildlife viewing	INC12	9.22 (2)	5.39 (1)				
Opportunity to learn	INC16				8.63 (2)		
Community awareness	INC17		3.96 (1)		12.11 (4)	7.56 (2)	
Interest in preservation	INC18				6.07 (2)		5.01 (1)

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was Kruskal Wallce Test (df)=degrees of freedom

Table 61: Correlation Between Perceptions of Incentives and Personal and Land Variables

<i>Incentives</i>		<i>Income</i>	<i>Education</i>	<i>Land Area</i>	<i>% Natural Area</i>	<i>Years of ownership</i>
Other incentives	INC5				-.251	
Providing fishing/hunting	INC10	-.252	-.345			
Providing other recreation	INC11					-.280
Wildlife viewing	INC12					-.300
Natural beauty/scenery	INC13			-.362		
Future protection	INC15			-.230		

Responses shown indicate a significant correlation ($p < .05$) using Kendall's Correlation

Table 62: Relationships Between Perceptions of Incentives and Personal and Land Variables

<i>Incentives</i>	<i>Occupation</i>	<i>Education</i>	<i>Background</i>	<i>Land Area</i>	<i>Years of membership</i>	<i>Method of Acquisition</i>
Other incentives	INC5					
Feeling of responsibility	INC9	7.34 (2)	4.93 (1)			
Providing fishing/hunting	INC10	9.36 (2)	4.07 (1)			11.68 (2)
Providing other recreation	INC11		4.01 (1)			
Wildlife viewing	INC12		4.53 (1)		6.53 (2)	
Natural beauty/scenery	INC13			10.41 (2)		
Opportunity to learn	INC16		5.62 (1)			6.91 (2)
Community awareness	INC17			5.92 (2)		
Whether others involved	INC19					

Responses shown indicate significant difference between subgroups for each variable (p<0.05)
Statistic used was Kruskal Wallance Test (df)=degrees of freedom

Table 63: Relationships Between Perceptions of Disincentives and Participation, Concern and Knowledge Variables

<i>Disincentives</i>	<i>Involvement in nature-related activities</i>	<i>Membership in Conservation group</i>	<i>Involvement in program</i>	<i>Interest in preservation (A18)</i>	<i>Interest in conservation (A17)</i>	<i>Environmental Concern</i>	<i>Conservation Knowledge</i>
Need to make money	DIS1	5.87 (2)					
Desire for independence	DIS3	4.26 (1)					
Other priorities	DIS4	4.60 (1)	6.32 (2)				
Lack of trust of government	DIS5	3.68 (1)			7.73 (3)	5.02 (1)	
Not thought about it	DIS6	7.14 (2)					
Lack of time	DIS7	4.64 (1)					
Difficulty with family	DIS9			13.66 (4)			9.05 (2)
Concern about restrictions	DIS10	8.61 (2)					
Concern about time frame	DIS11	8.12 (2)					
Competing incentives	DIS13			11.98 (2)			
Discontent with options	DIS17	7.23 (2)					
Discontent with organizations	DIS18	5.36 (1)					

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was Kruskal Wallance Test (df)=degrees of freedom

Table 64: Relationship Between Perceptions of Disincentives and Personal and Land Variables

<i>Disincentives</i>		<i>Land area</i>	<i>Importance of land</i>	<i>Method of Acquisition</i>	<i>% Natural Area</i>	<i>Years of Ownership</i>	<i>Residence</i>	<i>Occupation</i>	<i>Education</i>
Need to make money	DIS1	6.78 (2)	13.47 (2)				7.62 (2)	10.65 (2)	7.65 (2)
Desire for independence	DIS8								7.56 (2)
Fear cost vs. benefits	DIS8	6.69 (2)		3.80 (1)				6.70 (2)	
Concern about restrictions	DIS10							5.98 (2)	
Concern about time frame	DIS11					7.60 (2)			
Lack of trust for long term protection	DIS12				6.11 (2)				
Competing incentives	DIS13		7.07 (2)						
Lack of consultation with landowners	DIS14						9.59 (2)		

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was Kruskal Wallance Test (df)=degrees of freedom

Table 65: Correlation Between Perceptions of Disincentives and Personal and Land Variables

<i>Disincentives</i>		<i>Land area</i>	<i>Importance of land</i>	<i>% Natural Area</i>	<i>Years of Ownership</i>	<i>Income</i>	<i>Education</i>
Need to make money	DIS1	-.221	.391			-.220	
Desire for independence	DIS3						-.316
Lack of trust of government	DIS5						-.260
Fear cost vs. benefits	DIS8	-.260					
Concern about time frame	DIS11				-.345		
Lack of trust for long term protection	DIS12			-.311			
Competing incentives	DIS13		.301				

Responses shown indicate a significant correlation ($p < .05$) using Kendall's Correlation

Table 66: Relationships Between Recommendations and Participation, Concern and Knowledge Variables

<i>Recommendations</i>	<i>Involvement in nature-related activities</i>	<i>Membership in Conservation Group</i>	<i>Involvement in program</i>	<i>Conservation Practices (Leave areas for conservation purposes)</i>	<i>Environmental Concern</i>	<i>Interest in preservation (AIC18)</i>	<i>Conservation Knowledge</i>
Information on values	REC1	7.80 (2)					
Information on benefits	REC2		4.09 (2)				
Information on areas of value	REC3		6.44 (2)				
Information on management	REC4		8.95 (2)				
Information on options	REC5					12.89 (4)	
Cost sharing	REC11	7.75 (2)	5.70 (2)			11.67 (4)	
Social incentives	REC12			5.91 (1)	3.91 (1)		
Landowner contact	REC14	8.16 (2)		4.13 (1)			
Variety of options	REC15	8.66 (2)	4.34 (2)				
Variety of organizations	REC16	6.77 (2)	6.70 (2)				
Consultation with landowners	REC17	10.24 (2)				14.34 (4)	9.76 (2)
Easy process	REC18		7.27 (2)	3.05 (1)			
Knowledgeable advisors	REC19		5.99 (2)				
Information for independence	REC20		4.47 (2)				
	REC21		5.10 (2)				
Variety of approaches	REC22					6.64 (2)	
Commitment by organizations	REC23	6.14 (2)				11.39 (4)	
Other support	REC24						
Preference for agreement time frame	REC26					10.96 (4)	
						11.33 (4)	

Responses shown indicate significant difference between subgroups for each variable (p<0.05)

Statistic used was Kruskal Wallace Test (df)=degrees of freedom

Table 67: Relationships Between Recommendations and Personal and Land Variables

<i>Recommendations</i>	<i>% Natural Area</i>	<i>Importance of Land</i>	<i>Years of Ownership</i>	<i>Residence</i>	<i>Occupation</i>	<i>Income</i>	<i>Education</i>	<i>Background</i>
Information on benefits	REC2	12.38 (2)					8.67 (2)	8.83 (1)
Information on areas of value	REC3	6.82 (2)					7.94 (2)	4.71 (1)
Information on management	REC4				6.53 (2)		12.01 (2)	5.91 (1)
Information on options	REC5				10.69 (2)	8.31 (3)	14.34 (2)	8.38 (1)
Cash incentives	REC6				9.56 (2)			
Small grants	REC7							6.74 (1)
Income tax breaks	REC9				6.43 (2)			6.08 (1)
Large Grants	REC10						6.47 (2)	6.98 (1)
Cost sharing	REC11	9.36 (2)		10.22 (2)				
Varied incentives	REC13				7.42 (2)			7.76 (1)
Landowner contact	REC14			3.92 (1)		8.88 (3)		
Variety of options	REC15		5.98 (2)		6.33 (2)			9.19 (1)
Variety of organizations	REC16							7.05 (1)
Consultation with landowners	REC17						7.84 (2)	
Easy process	REC18						8.29 (2)	
Information for independence	REC20							5.58 (1)
Variety of approaches	REC22						12.09 (2)	
Other support	REC24	5.88 (2)						
Flexibility in agreements	REC25					9.32 (3)		

Responses shown indicate significant difference between subgroups for each variable (p<0.05)

Statistic used was Kruskal Wallace Test (df)=degrees of freedom

Table 68: Correlation Between Recommendations and Personal and Land Variables

<i>Recommendations</i>	<i>Years of Ownership</i>	<i>Income</i>	<i>Education</i>
Information on benefits	REC2	.241	.342
Information on areas of value	REC3		.335
Information on management	REC4		.389
Information on options	REC5	.318	.429
Variety of options	REC15		
Consultation with landowners	REC17		.319
Easy process	REC18		.339
Commitment by organizations	REC23		.243
Preference for agreement time frame	REC26	.288	.376

Responses shown indicate a significant correlation ($p < .05$) using Kendall's Correlation

Table 69: Relationships Between Preferences for Institutional Arrangements and Participation, Concern and Knowledge Variables

<i>Institutional Arrangements</i>	<i>Involvement in Conservation Activities</i>	<i>Membership in Conservation Organizations</i>	<i>Involvement in programs</i>	<i>Conservation practices (consider habitat in land use)</i>	<i>Conservation practices (sustainable resource use)</i>	<i>Conservation practices (leave areas for conservation purposes)</i>	<i>Environmental Concern</i>	<i>Conservation Knowledge</i>
Program								
Provincial government								
Municipal government				4.12 (1)				
Local community groups		4.25 (1)						
Coalition	7.98 (3)	3.74 (1)	3.90 (1)					
Private landowners							10.75 (1)	
Funding								
Federal government	9.50 (3)					5.62 (1)		
Provincial government					6.11 (1)	7.90 (1)		
Municipal government	5.67 (1)	6.46 (2)	8.51 (2)	10.35 (1)	4.03 (1)			
Local community groups		8.07 (2)						
Coalition	12.28 (3)	7.26 (2)	7.01 (2)					
Management								
Federal government								6.72 (2)
Municipal government		10.32 (2)	12.63 (2)					
Private conservation groups			10.47 (2)					
Local community groups		5.05 (1)	8.55 (2)					
Coalition	19.29 (3)	4.66 (1)	8.97 (2)					
Private landowners					3.75 (1)			10.16 (2)

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was a Chisquare (df)=degrees of freedom

Table 70: Relationships Between Preferences for Institutional Arrangements and Personal and Land Variables

<i>Institutional Arrangements</i>	<i>Importance of Land</i>	<i>Years of land ownership</i>	<i>Method of Acquisition</i>	<i>Residence</i>	<i>Land area</i>	<i>Age</i>	<i>Occupation</i>	<i>Background</i>
Management								
Federal government								6.40 (1)
Provincial government		14.31 (2)						
Municipal government								6.94 (1)
Private conservation groups	3.86 (1)		4.94 (1)			4.82 (1)		
Coalition		9.60 (2)						8.92 (1)
Private landowners							10.91 (2)	
Funding								
Provincial government	5.90 (2)	15.93 (2)						
Local community groups				9.13 (2)				
Coalition						4.56 (1)	7.63 (2)	4.01 (1)
Private landowners				11.45 (2)				
Program								
Federal government		6.96 (2)						6.18 (1)
Municipal government		8.01 (2)						3.95 (1)
Holding								
Private conservation groups								
Coalition		5.96 (2)		6.11 (2)	4.84 (1)	12.37 (1)		

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was a Chi-square (df)=degrees of freedom

Table 71: Relationships Between Preferences for Conservation Tools and Land, Personal and Participation Variables

<i>Tools</i>		<i>Land area</i>	<i>Importance of Land</i>	<i>Method of Acquisition</i>	<i>Age</i>	<i>Conservation practices (leave areas for conservation purposes)</i>	<i>Interest in preservation (AC18)</i>
Landowner contact	STR1			6.42 (2)			
Written agreement	STR3		6.12 (2)				
Easement	STR6			8.69 (2)			
Sale to group	STR7			6.16 (2)			13.32 (4)
Sale to government agency	STR8	9.02 (2)		7.67 (2)			
Rights of first refusal	STR11					4.47 (1)	
Donation in will	STR12			7.59 (2)	5.17 (1)		9.42 (4)

Responses shown indicate significant difference between subgroups for each variable ($p < 0.05$)

Statistic used was the Kruskal Wallace Test (df)=degrees of freedom

Table 72: Correlations Between Preferences for Conservation Tools and Land and Personal Variables

<i>Tools</i>		<i>Property Size</i>	<i>Age</i>	<i>Education</i>
Easement	STR6			.241
Sale to group	STR7	.226		
Donation in will	STR12		-.268	

Responses shown indicate a significant correlation ($p < .05$) using Kendall's Correlation

Table 73: Relationships Between Involvement in Conservation Activities and Personal and Land Variables

<i>Type of Involvement</i>		<i>Size of Property</i>	<i>Education</i>	<i>Income</i>
Participation in Nature-related Activities	INV1			8.54 (2)
Membership in conservation group	INV2		6.27 (2)	
Practice sustainable resource use	INV3	9.65 (2)		
Practice habitat improvements	INV4	3.85 (1)		

Responses shown indicate significant difference between sub-groups for each variable ($p < 0.05$)
 Statistic used was Kruskal Wallance Test (df)=degrees of freedom

Table 72: Association Between Involvement in Conservation Activities and Land Variables

<i>Type of Involvement</i>		<i>Economic importance of land</i>	<i>Method of Acquisition</i>	<i>Residence</i>	<i>Years of ownership</i>
Participation in Nature-related Activities	INV1				4.20 (1)
Membership in conservation group	INV2		6.14 (2)		
Practice sustainable resource use	INV3	4.29 (1)	10.77 (2)	3.98 (1)	
Consider habitat when using land	INV5		4.18 (1)		

Responses shown indicate significant difference between sub-groups for each variable ($p < 0.05$)
 Statistic used was Chisquare (df)=degrees of freedom

Table 73: Association Between Involvement in Conservation Activities and Personal Variables

<i>Type of Involvement</i>		<i>Education</i>	<i>Age</i>	<i>Occupation</i>	<i>Background</i>
Participation in Nature-related Activities	INV1	8.20 X^2 (2)			
Membership in conservation group	INV2				6.27 X^2 (2)
Consider habitat when using land	INV5		3.99 X^2 (1)	7.24 X^2 (2)	
Involved in conservation program					7.10 X^2 (2)

Responses shown indicate significant difference between sub-groups for each variable ($p < 0.05$)
 Statistic used was Chisquare (df)=degrees of freedom

Table 76: Relationships Between Survey Response Format and Other Variables

<i>Variable</i>	<i>Code</i>	<i>Statistic</i>	<i>Interviewed</i>	<i>Not interviewed</i>
		<i>KW</i>	<i>median</i> <i>(n=25)</i>	<i>median</i> <i>(n=25)</i>
<i>Personal Variables</i>				
Income (1=<15,000 2=15-25 3=25-35 4>35)	PERS6	18.78 (1)	2	4
Education (1<high school 2=high school 3>high school)	PERS7	9.69 (1)	1	2
<i>Knowledge</i> (1=very low 2=low 3=unsure 4=high 5=very high)				
Ducks unlimited	KC3	8.19 (1)	2	4
Private organizations	KC4	4.75 (1)	1	2
Total conservation knowledge (sum of items)	KC8	4.79 (1)	9.5	12
<i>Conservation Attitudes</i>				
Nature exists for humans	AC1	8.95 (1)	4	2
Limited room and resources	AC4	8.62 (1)	4	5
Maximum population	AC6	5.59 (1)	3	4
Concerned about NS	AC7	3.73 (1)	4	4
Use of land effects others	AC12	9.84 (1)	4	4
Encourage sustainability	AC14	8.71 (1)	4	5
Encourage preservation	AC15	3.73 (1)	4	4
<i>Incentives</i>				
Land for children	INC1	4.03 (1)	5	5
Natural beauty/scenery	INC13	7.29 (1)	4	5
<i>Disincentives</i>				
Need to make money	DIS1	4.95 (1)	4	2
<i>Recommendations</i>				
Information on options	REC5	9.34 (1)	4	5
Property tax breaks	REC5	3.85 (1)	4	5
Variety of options	REC8	4.46 (1)	4	4
Variety of organizations	REC15	5.23 (1)	3	4
Knowledgeable advisors	REC16	3.70 (1)	4	5
Information for independence	REC19	5.12 (1)	4	5
Coordination of efforts	REC20	4.78 (1)	4	5
Strong commitment from organizations	REC21	6.46 (1)	4	4
Other support	REC23	5.31 (1)	4	4
<i>Preference for Agreement Time frame</i> (1=no interest 2=<10 years 3=10-25 4=permanent)				
Time frame for Agreement	REC26	4.73 (1)	2	2

Table 76 continued

Tools				
Landowner contact	STR1	4.40 (1)	4	4
Sale to group	STR7	5.66 (1)	4	2

Responses shown indicate significantly association between variables ($p < 0.05$)

Statistic used was a Kruskal Wallance Test (df)=degrees of freedom

(measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree-unless other scale is indicated)

Table 77: Association Between Survey Response Method and Other Variables

Variable	Code	Statistic		Interviewed median (n=25)	Not interviewed median (n=25)
		X ² or KW	(df)		
Personal Variables					
Occupation (1=resource 2=other 3=professional)	PERS5	13.54	X ² (2)	1	2.5
Background (1=rural 2=urban or small town)	PERS8	9.07	X ² (1)	1	1
Land Variables					
Size of property (1<50 ha 2=50-200 3>200)	LAND1	4.09	X ² (1)	2	1
Residence (1=permanent 2=seasonal 3=absentee)	LAND7	9.77	X ² (2)	1	1.5
Involvement in Conservation Activities					
Membership in conservation group (1=no 2=resource-oriented 3=preservation-oriented)	INV2	4.38	X ² (1)	1	1
Practice sustainable resource use (1=no 2=yes)	INVSURU	4.37	X ² (1)	2	1
Institutional Options (1=disagree 2=agree)					
Funding					
Private landowners	FUND7	3.95	X ² (1)	1	1
Management					
Federal government	MGMT1	4.71	X ² (1)	1	1
Provincial government	MGMT2	4.63	X ² (1)	1	1
Private landowners	MGMT7	5.95	X ² (1)	2	2
Holding agreement					
Provincial government	HOLD2	4.85	X ² (1)	1	2

Responses shown had a significantly association ($p < 0.05$)

Statistic used was a chisquare (df)=degrees of freedom

12. APPENDIX 5: TABLES COMPARING SUBGROUPS OF CONSERVATION PROFESSIONALS

Table 78: Incentives-Comparison of Subgroups of Conservation Professionals

<i>Incentives</i>	<i>Statistic</i>		<i>Academics median (n=10)</i>	<i>Non-academics median (n=28)</i>	<i>Statistic</i>		<i>Preservation-oriented median (n=25)</i>	<i>Resource-oriented median (n=10)</i>
	<i>KW</i>	<i>(df)</i>			<i>KW</i>	<i>(df)</i>		
1. Protecting land for children	5.36	(1)	4	5				
3. Concern about nature					4.24	(1)	5	4
7. Protecting conservation values	4.94	(1)	4	5				
13. Protecting natural beauty/scenery	4.39	(1)	4	4.5				
16. Opportunity to learn about conservation	5.92	(1)	3	4				
17. Opportunity for community awareness-building	6.13	(1)	3	4				

KW=Kruskal Wallance Test (df)=degrees of freedom

Responses shown are significantly different between subgroups of professionals ($p < 0.05$)

(measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 79: Disincentives to Participation-Comparison of Subgroups of Conservation Professionals

<i>Disincentives</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Academics</i> <i>median</i> <i>(n=10)</i>	<i>Non-</i> <i>academics</i> <i>median</i> <i>(n=28)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Non-</i> <i>professionals</i> <i>median</i> <i>(n=10)</i>	<i>Profes-</i> <i>sionals</i> <i>median</i> <i>(n=28)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Govern-</i> <i>ment</i> <i>median</i> <i>(n=19)</i>	<i>Non-</i> <i>government</i> <i>median</i> <i>(n=13)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Preservation</i> <i>-oriented</i> <i>median</i> <i>(n=25)</i>	<i>Resource-</i> <i>oriented</i> <i>median</i> <i>(n=10)</i>
1. Need to make money												
12. Lack of trust of programs to protect land	4.52 (1)	4	3									
15. Tax penalties for donating/selling land							4.71 (1)	4	5			
16. Fear of liability												
19. Lack of landowner knowledge on values of conservation							4.27 (1)	4.5	4			
21. Lack of conservation ethic										4.72 (1)	2	4
22. Lack of recognition of land value				4.87 (1)	5	4				6.37 (1)	4	4
25. Lack of social incentives	7.35 (1)	4	3							5.40 (1)	2.5	4
26. Lack of educational incentives	4.30 (1)	5	4							4.74 (1)	4	4

KW=Kruskal Wallance Test (df)=degrees of freedom

Responses shown are significantly different between subgroups of professionals ($p<0.05$)

(measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 80: Challenges-Comparison of Subgroups of Subgroups of Conservation Professionals

<i>Challenges</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Academics</i> <i>median</i> <i>(n=10)</i>	<i>Non-</i> <i>academics</i> <i>median</i> <i>(n=28)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Non-</i> <i>professionals</i> <i>median</i> <i>(n=10)</i>	<i>Profes-</i> <i>sionals</i> <i>median</i> <i>(n=28)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Govern-</i> <i>ment</i> <i>median</i> <i>(n=19)</i>	<i>Non-</i> <i>government</i> <i>median</i> <i>(n=18)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Preservation</i> <i>-oriented</i> <i>median</i> <i>(n=25)</i>	<i>Resource-</i> <i>oriented</i> <i>median</i> <i>(n=10)</i>
1. Lack of scientific data				5.02 (1)	4	3						
5. Lack of coordination between government and non-government groups	4.12 (1)	4.5	4									
8. Lack of permanency of programs							4.21 (1)	3.5	4			
9. Property tax implications for non-governmental groups				5.33 (1)	3.5	4	10.36 (1)	3	4			
11. Lack of 'common ground' amongst conservation groups, agencies and individuals	4.80 (1)	4	3				7.30 (1)	3	4			
12. Lack of legal and policy support for private land conservation				5.71 (1)	4	4.5				7.19 (1)	2	4

KW=Kruskall Wallace Test (df)=degrees of freedom

Responses shown are significantly different between subgroups of professionals ($p < 0.05$)

(measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 81: Recommendations-Comparison of Subgroups of Conservation Professionals

<i>Recommendations</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Academics</i> <i>median</i> <i>(n=10)</i>	<i>Non-</i> <i>academics</i> <i>median</i> <i>(n=28)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Non-</i> <i>professionals</i> <i>median</i> <i>(n=10)</i>	<i>Profes-sionals</i> <i>median</i> <i>(n=28)</i>	<i>Statistic</i> <i>KW (df)</i>	<i>Preservation-</i> <i>oriented</i> <i>median</i> <i>(n=25)</i>	<i>Resource-oriented</i> <i>median</i> <i>(n=10)</i>
6. Cash incentives				3.92 (1)	2.5	4			
7. Small grants									
8. Property tax breaks				6.64 (1)	5	5			
14. Landowner contact program	4.02 (1)	4.5	5						
25. Flexibility in agreement time frame				3.86 (1)	3.5	4			
31. Grants to port the work of non-governmental organizations				9.90 (1)	3	5	7.58 (1)	3	4

KW=Kruskall Wallace Test (df)=degrees of freedom

Responses shown are significantly different between subgroups of professionals ($p < 0.05$)

(measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

Table 82: Preferences for Institutional Arrangements-Comparison of Subgroups of Conservation Professionals

<i>Institutional Arrangements</i>	<i>Statistic</i> χ^2 (df)	<i>Government median</i> (n=19)	<i>Non-government median</i> (n=18)	<i>Statistic</i> χ^2 (df)	<i>Preservation-oriented median</i> (n=25)	<i>Resource-oriented median</i> (n=16)	<i>Statistic</i> χ^2 (df)	<i>Academics median</i> (n=16)	<i>Non-academics median</i> (n=28)
Program									
provincial government									
private organizations				5.00 (1)	1	1			
Management									
local community group							4.20 (1)	2	2
private organizations	4.38 (1)	2	2						
Holding agreement									
provincial government				3.96 (1)	2	2			

χ^2 =Pearson Chi-square (df)=degrees of freedom

Responses shown are significantly different between subgroups of professionals ($p<0.05$)

(measured on a two point scale where 1=disagree 2=agree)

Table 83: Preferences for Tools for Private Land Conservation-Comparison of Subgroups of Conservation Professionals

<i>Tools</i>	<i>Statistic</i> KW (df)	<i>Government median</i> (n=19)	<i>Non-government median</i> (n=18)
8. Sale to government	5.43 (1)	4	3
10. Donation to government	4.15 (1)	5	4

KW=Kruskal Wallance Test (df)=degrees of freedom

Responses shown are significantly different between subgroups of professionals ($p<0.05$)

(measured on a scale of 1 to 5 where 1=strongly disagree 2=disagree 3=unsure 4=agree 5=strongly agree)

13. APPENDIX 6: SUMMARY TABLES OF RESULTS AND COMPARISON WITH LITERATURE

Table 84: Conservation Attitudes and Knowledge: Summary and Literature Comparison

<i>Variable</i>	<i>Major Findings Similar to Previous Findings</i>	<i>Empirical Support Found</i>	<i>New Findings</i>
Environmental Concern	<ul style="list-style-type: none"> • Most landowners demonstrated a moderate level of environmental concern • Occupation was related to environmental concern 		<ul style="list-style-type: none"> • Conservation knowledge is related environmental concern
*Conservation/Private Land Conservation Attitudes	<ul style="list-style-type: none"> • Landowners are concerned about the environment and recognize the need for nature conservation • Many landowners have utilitarian, and resource-use based perceptions of nature conservation 	<ul style="list-style-type: none"> • There are some landowner attitudes which may hinder participation in private land conservation 	<ul style="list-style-type: none"> • Landowners support private land conservation efforts • Over 80% of landowners were interested in stewardship of private lands which do not sacrifice resource-use options • Attitudes varied between landowners involved and not involved in private land conservation • Variables related to attitudes were: age, education, income, occupation, conservation knowledge, environmental concern, size of land, residence, participation in nature-related activities, membership in conservation group, participation in conservation/resource program, involvement in conservation practices
*Private Land Conservation Knowledge		<ul style="list-style-type: none"> • Landowner knowledge on conservation issues and on private land conservation was low 	<ul style="list-style-type: none"> • Landowner knowledge on private land conservation options was low • Knowledge varied between landowners involved and not involved in private land conservation • Variables related to private land conservation knowledge were: education, income, environmental concern, method of land acquisition, participation in nature-related activities, membership in conservation group, participation in conservation/resource program

*variables not studied empirically previously

Table 85: Incentives-Summary and Literature Comparison

<i>Variable</i>	<i>Major Findings Similar to Previous Findings</i>	<i>Empirical Support Found</i>	<i>New Findings</i>
Factors encouraging participation in private land conservation	<ul style="list-style-type: none"> • Most respondents (landowners and conservation professionals) considered the major factors encouraging participation to be: ecocentric factors related to environmental concern and a desire to protect diverse natural values, and a sense of stewardship. • Other important factors include protection of resources for practical reasons, protection of land for family benefit, economic security, economic and social incentives 	<ul style="list-style-type: none"> • Conservation professionals also indicated that financial and other incentives (social, educational) are also important 	<ul style="list-style-type: none"> • Recreational opportunities and educational opportunities (personal, and for the community) were perceived as a factor encouraging participation • Additional factors encouraging participation included whether friends neighbors or family participated, and family tradition • Professionals also indicated that non-monetary incentives were important in encouraging participation • There were differences in the factors perceived to encourage participation between participants and non-participants • Variables related to perceptions of factors encouraging participation were: education, income, occupation, background, private land conservation knowledge, size of land, method of land acquisition, natural area remaining and years of ownership, participation in nature-related activities, membership in conservation group, participation in conservation/resource program, involvement in conservation practices

*variables not studied empirically previously

Table 86: Challenges and Disincentives-Summary and Literature Comparison

<i>Variable</i>	<i>Empirical Support Found</i>	<i>New Findings</i>
*Factors discouraging participation in private land conservation	<ul style="list-style-type: none"> • Most respondents (landowners and conservation professionals) considered the major disincentives to be: a lack of trust of government, fear of liability, need to make money, belief in landowner rights, desire for independence in land management and concern about restricting uses • Professionals also indicated that the following are disincentives: tax penalties, the time frames of agreements, a lack of trust in programs to protect land indefinitely, a lack of incentives, a lack of coordination of efforts, and lack of landowner knowledge about options and issues. 	<ul style="list-style-type: none"> • Landowners indicated concern about the impacts of environmental regulations and policies on their land use • Some landowners were concerned about the implications of the forest industry on the environment and on private landowners • Professionals also indicated that competing incentives (i.e. forestry) may inhibit participation • Variables related to perceptions of factors discouraging participation were: education, occupation, importance of land, method of land acquisition, natural area remaining, residence, years of ownership, participation in nature-related activities, membership in conservation group, participation in conservation/resource program
*Major challenges facing private land conservation efforts	<ul style="list-style-type: none"> • According to conservation professionals, the major challenges to private land conservation efforts include a lack of the following: communication, coordination of efforts, commitment, scientific information, legal and policy support and lack of permanency of private land conservation program/efforts 	

*variables not studied empirically previously

Table 87: Preferences for Tools and Institutional Options-Summary and Literature Comparison

<i>Variable</i>	<i>Major Findings Similar to Previous Findings</i>	<i>Contradicted Previous Studies</i>	<i>New Findings</i>
Preferences for Private Land Conservation Tools	<ul style="list-style-type: none"> • Most landowners support short term and flexible agreements • The most preferred tool is landowner contact, then written and management agreements, conservation easements and rights of first refusal, and donating land to conservation groups • Most landowners did not support zoning, leasing, verbal agreements and sale or donation of land to the government • Age, and income were related to preferences for tools 	<ul style="list-style-type: none"> • Verbal agreements were not supported by most landowners and conservation professionals • preferences varied (there was not a clear separation between those most and least preferred) 	<ul style="list-style-type: none"> • Large government grants for landowners were not supported by most landowners and conservation professionals • Landowners did not support the option of selling land to the government for conservation • Variables related to preferences include: conservation/ private land conservation knowledge • Variables related to preferences for tools were: private land conservation knowledge, importance of land, method of land acquisition, involvement in conservation practices • Education , income and background were related to preferences for agreement time frames
Preferences for Institutional Arrangements	<ul style="list-style-type: none"> • Preferences varied and included both government and non-government arrangements and a coalition of all conservation interests • Most landowners were not very flexible in their preferences for institutional arrangements (most only supported one or two) • Variables related to preferences for institutional arrangements were: education , occupation, size of land, importance of land 		<ul style="list-style-type: none"> • There was strong support for landowner involvement in all aspects private land conservation programs, particularly land management • Variables related to preferences for institutional arrangements were: age, income, background, private land conservation knowledge, method of land acquisition and residence, participation in nature-related activities, membership in conservation group, participation in conservation/resource program, involvement in conservation practices

*variables not studied empirically previously

Table 88: Recommendations-Summary and Literature Comparison

<i>Variable</i>	<i>New Findings</i>
<p>*Respondents' recommendations for private land conservation</p>	<ul style="list-style-type: none"> • The strongest support of recommendations was for: economic incentives, cost sharing and small grants, appropriate and increased educational efforts, facilitation of landowner involvement, infrastructure building, consulting with landowners, coordinating conservation efforts, and increasing legal, political and economic support for private land conservation. • Most respondents (landowners and conservation professionals) supported economic incentives, particularly tax breaks • Most respondents (landowners and conservation professionals) supported educational and social incentives • Conservation professionals also recommended revising tax laws influencing private land conservation, providing training for professionals, government grants for non-government conservation efforts, and developing innovative conservation approaches • Variables related to acceptance of recommendations to enhance private land conservation were: age, education, income, occupation, background, environmental concern, importance of land, natural area remaining, years of ownership, participation in nature-related activities, membership in conservation group, participation in conservation/resource program, involvement in conservation practices

*variables not studied empirically previously

Table 89: Factors Influencing Participation-Summary and Literature Comparison

<i>Variable</i>	<i>Major Findings Similar to Previous Findings</i>	<i>New Findings</i>
<p>*Differences between involved landowners and non-involved landowners</p>	<ul style="list-style-type: none"> • Involved landowners typically had higher education and incomes, non-resource-based occupations, urban backgrounds 	<ul style="list-style-type: none"> • Involved landowners typically has smaller lands, purchased not inherited, were not economically dependent on their land and were not resident on their rural land • Involved landowners were more knowledgeable about conservation and private land conservation options • Involved landowners supported a greater diversity of institutional arrangements and tools • Involved landowners were more interested in long term and permanent agreements • Involved landowners were more motivated by ecological and stewardship factors than economic, practical and family concerns.

*variables not studied empirically previously

Table 90: Main Issues Influencing Private Land Conservation-Summary

<i>Variable</i>	<i>Empirical Support Found</i>
<p>*Most Significant Issues Influencing Private Land Conservation in Nova Scotia</p>	<ul style="list-style-type: none"> • Economic challenges facing private land conservation efforts • Economic issues for landowners • A need for education on various levels (based on landowner knowledge, attitudes and concerns; and a lack of information for conservation professionals; and social attitudes impeding private land conservation efforts) • A need for promotion of private land conservation efforts • A need for varied conservation tools • A need to include both preservation and stewardship type tools • A need to focus on landowner consultation, easements, written agreements and management agreements • Need for a variety of institutional options including government and non-government options, operating on national, provincial and local scales • A need for conservation efforts to be approached from a landowner-centered and community-based perspective, with adequate communication and consultation of all interests • A need for coordination and integration of private land conservation efforts within and between government and non-government efforts, between preservation and stewardship efforts, between various approaches to conserving nature on private lands, and between scales of efforts.

*variables not studied empirically previously

14. APPENDIX 7: RESOURCES FOR PRIVATE LAND CONSERVATION

Resources on Conservation Tools for Private Land Conservation

Andrews, W., and Loukidelis, D. **Leaving a Living Legacy. Using Easements in British Columbia.** West Coast Environmental Law Foundation.

Diehl, J. and Barrett, T. 1988. **The Conservation Easement Handbook. Managing Land Conservation and Historic Preservation Easement Programs.** Trust for Public Land: San Francisco, CA.

Findlay, Barbara and Ann Hillyer. **Here Today, Here Tomorrow. Legal Tools for the Voluntary Protection of Private Land in British Columbia.** West Coast Environmental Law Research Foundation.

Available at:

West Coast Environmental Law Research Foundation

1001-207 West Hastings St.

Vancouver, BC

V6B 1H7

phone (604) 684-7378 or fax (604) 684-1312

Hilts, S. and Reid, R. 1993. **Creative Conservation. A Handbook for Ontario Land Trusts.** Federation of Ontario Naturalists.

Available at:

F.O.N. 355 Lesmill Road

Don Mills, ON

M3B 2W8

phone (416) 444-8419 or fax (416) 444-9866.

Island Press. **Land Conservation Through Public/Private Participation.**

Kwasniak, A. (ed.) 1994. **Private Conservancy: The Path to Law Reform.** Edmonton, AB: Environmental Law Center.

For copies: Environmental Law Center (Alberta) Society

201, 10350-124 Street

Edmonton, AB

T5N 3V9

Land Trust Alliance. **Conservation Options. A Landowner's Guide.** The Land Trust Alliance: Washington, DC

Land Trust Alliance. **A Guide to Buying Land for Conservation.** The Land Trust Alliance: Washington, DC.

Lind, B. 1991. **The Conservation Easement Stewardship Guide. Designing, Monitoring, and Enforcing Easements.** Land Trust Alliance: Washington, DC.

Power, T. 1995. The Conservation Easement, A New Tool for Conservation on Private Lands. In (Herman, T., Bondrup-Nielsen, S., Willison, J. and Munro, N. **Ecosystem Monitoring and Protected Areas. Proceedings of the Second International Conference on Science and the Management of Protected Areas.** Dalhousie University, Nova Scotia. May. Wolfville, Nova Scotia: Science and the Management of Protected Areas.

The Public Land Trust:

The Conservation Easement Handbook: Land Conservation and Historic Preservation Easement Programs

The Conservation Easement Stewardship Guide. Design, Monitoring and Enforcing Easements.

Appraising Easements. Guidelines for Valuation of Historic Preservation and Land Conservation Easements.

Conservation Options. A Landowner's Guide.

Conservation Options for Private Landowners.

Protect Your Land With a Conservation Easement.

Small, S. 1992. **Preserving Family Lands. Essential Tax Strategies for the Landowner.** Mass: Landowner Planning Center.

Tingly, D., Kirby, R., and Hupfer, R. 1986. **Conservation Kit: A Legal Guide to Private Conservancy.** Environmental Law Center (Alberta) Society: Edmonton.

Trombetti, O. and Cox, K. 1990. **Land, Law and Wildlife Conservation: The Role and Use of Conservation Easements and Covenants in Canada.** Reference Paper No. 3. Ottawa: Wildlife Habitat Canada.

Handbooks on Landowner Options

Hilts, S. and Moull, T. 1988. **Protecting Ontario's Natural Heritage Through Private Stewardship.** The Natural Heritage League: Waterloo, ON.

Island Nature Trust. 1989. **Private Stewardship. The Landowner's Options. A Guide to Voluntary Land Protection.** Island Nature Trust: Prince Edward Island.

Land Trust Alliance. **Conservation Options. A Landowner's Guide.** The Land Trust Alliance: Washington, DC.

Natural Heritage League. 1988. **Protecting Ontario's Natural Heritage Through Private Stewardship.**

Ontario Heritage Foundation. 1990. **Options for Landowners. A Guide to the Voluntary Protection of Heritage Properties Along the Niagara Escarpment.** The Ontario Heritage Foundation: Toronto.

Resources for Starting or Operating a Land Trust

Hilts, S. and Reid, R. 1993. **Creative Conservation. A Handbook for Ontario Land Trusts.** Federation of Ontario Naturalists.

The Public Land Trust:

The Standards and Practices Guidebook. An Operational Manual for Trusts.

Starting a Land Trust. A Guide to Forming a Land Conservation Organization.

Resources on Landowner Contact Work

Natural Heritage League of Ontario. **Landowner Contact Manual.**

Major Private Land Conservation Contacts (sources of books, training etc.)

The Land Trust Alliance
1319 F Street NW Suite 500
Washington, DC
20004-1106
(202) 638-4725 (fax) (202) 638-4730 (phone)

The Trust for Public Land
116 New Montgomery St. 4th floor
San Francisco, CA 94105
(415) 495-4014 (phone) 1-800-714-LAND

Resources for Private Land Conservation Groups Available on the World Wide Web or Email

Private Land Conservation News Group

A newsgroup on the internet for land trusts through which land trusts from throughout the world share their experiences, problems, ideas and queries

- It is available on the world wide web:
- To join the newsgroup (and therefore receive all their postings), send an email to:
majordomo@indiana.edu
Within the text area of the screen, write "subscribe landtrust"
- To post a message to the group, send an email to:
landtrust@indiana.edu

Creating Land Trusts Web Site (www.possibility.com/LandTrust)

- Includes a detailed and practical guide on land trusts from British Columbia
- Includes a jump-station to reach other relevant web sites on private land conservation
- Includes information of private land conservation tools, how to start a trust, information of the Land Trust Alliance and the Trust for Public Lands, and books offered through the Land Trust Alliance

Trust for Public Land Web Site (www.igc.apc.org/tpl/index.html)

Web Sites of Specific Local Land Trusts

Southwest Michigan Land Conservancy
(www.possibility.com/LandTrust/Swmlc.html)

West Pennsylvania Conservancy
(www.envirolink.org/orgs/wpacons/html)

Jefferson Land Trust
(www.olympus.net/community/saveland.htm)

- Includes an interactive guide to protecting land
- Includes a jump-station to reach other relevant web sites on private land conservation
- Includes a copy of the private land conservation books by Andrews and Loukidelis, and by Findlay and Hillyer.

Land Trust Alliance (www.crp.cornell.edu)

- Includes information on easements

Environmental Law Association (Freenet.vancouver.bc.ca/local/wcel/ppl/welcome.html)

- Includes the private land conservation book by Findlay and Hillyer.

Private Land Conservation Contacts In Nova Scotia

Government Agencies

Canadian Forest Service
(506) 452-3398

Canadian Heritage (Parks Department)
(902) 426-2244

Canadian Wildlife Service
Box 1590
Sackville, NB.
E0A 3C0

Nova Scotia Department of Natural Resources
Parks Department Division
RR1 Belmont
Colchester County Nova Scotia
B0M 1L0
(902) 662-3030 David MacKinnon (Special Places Program)

Nova Scotia Department of Natural Resources
Wildlife Division
136 Exhibition Street
Kentville, Nova Scotia.
B4N 4E5
(902) 679-6091 Randy Milton (Stewardship) Terry Power (Wetland stewardship)

Non-governmental Groups

Bras d'Or Preservation Foundation
294-2386 Jack Stevens

Ducks Unlimited
(902) 667-8726

Kingsburg Coastal Conservancy
Jeff Amos (902) 766-4527
Margaree Environmental Association
258-3354 Neil Livingston

The Nature Conservancy of Canada
857-9414 Bill Schwartz

The Nova Scotia Nature Trust
425-7900 Ross Cantwell

Wildlife Habitat Canada
7 Hinton Avenue Suite 200
Ottawa, ON.
K4P 4Y1
(613) 722-3318 Greg Filyk

World Wildlife Fund
Colin Stewart
(902) 466-7168

15. REFERENCES CITED

- Agency of Environmental Conservation. 1982. **Vermont Wetlands. Owner Attitude Survey.** Montpelier, Vermont: Agency of Environmental Conservation
- Amos, B. 1995. **The International Context for Heritage Conservation in Canada.** Paper presented at the Symposium on the Heritage Estate. Waterloo, ON.: University of Waterloo, Faculty of Environmental Studies.
- Arbuthnot, J. 1977. The roles of attitudinal and personality variables in the prediction of environmental behaviour and knowledge. **Environment and Behaviour.** Vol. 9 (2): pp. 217-232.
- Arcury, T. 1990. Environmental attitude and environmental knowledge. **Human Organization.** Vol. 49: pp. 300-304.
- Arcury, T., Johnson, T. and Scollay, S. 1986. Ecological worldview and environmental knowledge: The "new environmental paradigm." **Journal of Environmental Education.** Vol. 17: pp. 35-40.
- Atkinson, J. (Ed.) 1986. **Building Support for Conservation in Rural Areas.** Proceedings. Volume 2: Recommendations and Conclusions. Highgate Springs, Vermont. Quebec Labrador Foundation and the Atlantic Center for the Environment.
- Attridge, I. 1994. **An Overview of Canadian Biodiversity Law.** Paper presented at the First North American Conference on Social and Economic Incentives for the Conservation of Biodiversity and Biological Resources. Mexico City, March 1994. Toronto: Canadian Institute for Environmental Law and Policy.
- Bardecki, J. 1984. **Wetland Conservation Policies in Southern Ontario: A Delphi Approach.** Geographical Monographs. No. 16. Ph.D. Thesis. York: Geography Department. York University.
- Beardmore, R. 1985. **Atlantic Canada's Natural Heritage Areas.** Parks Canada Atlantic Region. Ottawa: Minister of Supply and Services Canada.
- Beatley, T. 1994. **Habitat Conservation Planning. Endangered Species and Urban Growth.** Austin, Texas: University of Texas Press.
- Benson, J., and Willis, K. 1988. Conservation costs, agricultural intensification and the Wildlife and Countryside Act 1981: A case study and simulation on Skipwith Common, North Yorkshire, England. **Biological Conservation.** Vol. 44 (3): pp. 157-178.

- Biodiversity Science Assessment Team. 1994. **Biodiversity in Canada. A Science Assessment.** Canada: Minister of the Environment, Department of Supply and Services.
- Bishop, R. 1981. Economic Considerations Affecting Landowner Behaviour. In Dumke, R., Burger, G., and March, J. (Eds.) **Wildlife Management on Private Lands.** Proceedings of: Symposium on Wildlife Management on Private Lands. May 1981. Milwaukee, Wisconsin. Wisconsin: Wildlife Society.
- Board on Environmental Studies and Toxicology and Commission on Life Sciences. 1993. **Setting Priorities for Land Conservation.** National Research Council. Washington, DC: National Academy Press.
- Botkin, D., and Keller, E. 1995. **Environmental Science. Earth as a Living Planet.** Toronto: John Wiley and Sons, Inc.
- Bourke, L., and Luloff, A. 1994. Attitudes toward the management of non-industrial private forest land. Department of Agricultural Economics and Rural Sociology. Pennsylvania State University. **Society and Natural Resources.** Vol. 7(5): pp. 445-457.
- Brechtel, S. and Anderson, P. 1987. The Alberta Landowners Habitat Program. In Wildlife Habitat Canada. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop.** Winnipeg, Canada. August 1987. Ottawa: Wildlife Habitat Canada.
- Brusnyk, L., Westworth, D., and Adamowicz, W. 1990. **An Evaluation of the Landowner Habitat Project.** Report Submitted to the Alberta Fish and Wildlife Division and Wildlife Habitat Canada.
- Bull, G. 1993. Partnerships and the Canadian Parks Service. In Brown, E. and Veirs, S. (Eds.) **Partners in Stewardship. Proceedings of the 7th Conference on Research and Resource Management in Parks and on Public Lands.** Hancock, Michigan: The George Wright Society.
- Burnett, J., Dauphine, C. Jr., McCrindle, S., and Mosquin, T. 1989. **On the Brink. Endangered Species in Canada.** Saskatoon, Saskatchewan: Western Producer Prairie Books.
- Burnett, S. and Hundert, E. 1994. **Protecting Our Natural Heritage: Conservation Areas in Atlantic Environment Canada.** Natural Resources Canada, Canadian Forest Service, Canadian Heritage.
- Buttel, F. 1979. Age and Environmental Concern: A multivariate analysis. **Youth and Society.** Vol. 10(3): pp. 237-256.

- Buttel, R. 1987. New directions in environmental sociology. **Annual Review of Sociology**. Vol. 13: pp. 465-488.
- Canadian Council of Ministers of the Environment, 1991. **Meeting of the Canadian Council of Ministers of the Environment**. May. Halifax, Nova Scotia. Ottawa: Environment Canada.
- Canadian Environmental Advisory Council. 1991. **A Protected Areas Vision for Canada**. Ottawa: Minister of Supply and Services Canada.
- Canadian Heritage-Parks. 1992. **Strategic Framework to Sustain the Integrity of Ecosystems**.
- Canadian Heritage-Parks. 1994. **Parks Canada**. Final Draft.
- Canadian Society of Environmental Biologists. 1987. **Conservation Strategies in Canada**. Toronto: The Canadian Society of Environmental Biologists.
- Canadian Wildlife Service-Environment Canada and the Federal-Provincial Task Force on the Importance of Wildlife to Canadians. 1993. **The Importance of Wildlife to Canadians. Highlights of the 1991 Survey**. Ottawa: Minister of Supply and Services.
- Carbin, R. 1991. Land Trusts: The New England Experience. In Mitchell, B. and Labaree, J. **Atlantic Region Stewardship Workshop**. September 1990. Prince Edward Island: Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Carruthers, J. 1989. Cooperative Approaches to Parks and Protected Areas in Canada. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference**. Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Heritage Resources Center, University of Waterloo: Waterloo.
- Caza, C. 1993. In Proceedings of the First National Wildlife Habitat Workshop. **April 1993. Winnipeg, Manitoba**.
- Christenson, J. 1978. Individual verses public rights: Implications of support for land use planning and control. **Journal of Environmental Management**. Vol. 9: pp. 50-57.
- Cockerham, W., Blevins, A. Jr. 1977. Attitudes toward land use planning and controlled population growth in Jackson Hole. **Journal of the Community Development Society**. Vol. 8(1): pp. 62-73.
- Cog, K. 1993. **Wetlands. A Celebration of Life**. Sustaining Wetlands. Issues Paper No. 1993-1. Ottawa: North American Wetlands Conservation Council.

- Comozzi, A. 1991. Adult Participation and its Role in Stewardship. In Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop**. September 1990. Prince Edward Island: Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Council on Environmental Quality. 1981. **Global Future: Time to Act. Report to the President on Global Resources, Environment and Population**. United States Department of State.
- Cox, K. 1989. Progress and Opportunities in Advancing a Landscape Approach to Natural Heritage Conservation. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference**. Ottawa-Quebec City-Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Cox, K. 1991a. In Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop**. September 1990. Prince Edward Island: Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Cox, K. 1991b. In Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop**. September 1990. Prince Edward Island: Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Cox, K. 1995. Conference Presentation at Commitment 2000: Getting There. White Point Beach Lodge Resort, Nova Scotia. September 1995.
- Cutting, M., and Cocklin, C. 1992. Planning for forest conservation in the Auckland region, New Zealand. **Landscape and Urban Planning**. Vol. 23 (1): pp. 55-69.
- Danielson, L. and Leitch, J. 1986. Private versus public economics of prairie wetland allocation. **Journal of Environmental Economic Management**. Vol. 13 (1): p. 81-92.
- Dearden, P. and Rollins, R. (Eds.) 1993. **Parks and Protected Areas in Canada. Planning and Management**. Toronto: Oxford University Press.
- Deblinger, R., and Jenkins, R. Jr. 1991. Preserving coastal biodiversity: The private, nonprofit approach. **Coastal Management**. Vol. 19 (1): pp. 103-112.
- Diehl, J. and Barrett, T. 1988. **The Conservation Easement Handbook. Managing Land Conservation and Historic Preservation Easement Programs**. San Francisco, CA.: Trust for Public Land.

- Denhez, M. 1992. **You Can't Give it Away. Tax Aspects of Ecologically Sensitive Lands.** Sustaining Wetlands. Issues Paper. No. 1992-4.
- Dodds, D. 1993. **Challenge and Response. A History of Wildlife and Wildlife Management in Nova Scotia** Department of Natural Resources: Nova Scotia.
- Dottavio, F., Brussard, Pl., and McCrone, J. 1990. **Protecting Biological Diversity in the National Parks: Workshop Recommendations.** May, 1988. Great Smoky Mountains National Park. Tennessee. Washington, DC: US Department of the Interior.
- Ducks Unlimited. Undated. **More Than Just Ducks!** Ducks Unlimited Canada. Stonewall, Manitoba.
- Duke, T. (undated). **Endangered Species.** Reprint of an article from NS Conservation. Halifax, Nova Scotia: Nova Scotia Department of Natural Resources.
- Dunlap, R. 1975. The impact of political orientation on environmental attitudes and actions. **Environment and Behaviour.** Vol. 7 (4): pp. 428-454.
- Dunlap, R., and Heffernan, R. 1975. Outdoor Recreation and Environmental Concern. An Empirical Investigation. **Rural Sociology.** Vol. 40(1): pp. 18-30.
- Eagles, P. 1984. **The Planning and Management of Environmentally Sensitive Areas.** New York: Longman.
- Edgell, M., and Nowell, D. 1989. The new environmental paradigm scale: Wildlife and environmental beliefs in British Columbia. **Society and Natural Resources.** Vol. 2: pp. 285-296.
- Edwards, V. and Sharp, B. 1990. Institutional Arrangements for Conservation on Private Land in New Zealand. **Journal of Environmental Management.** Vol. 31 (4): pp. 313-326.
- Edwards, V. 1994. Developing America's natural areas market. **Natural Areas Journal.** Vol. 14 (1): pp. 17-21.
- Ehrlich, P. and Ehrlich, A. 1992. The value of biodiversity. **Ambio.** Vol. 21 (3): pp. 219-226.
- Ehrlich, P. and Wilson, E. 1991. Biodiversity studies: Science and policy. **Science.** Vol. 253 (5021): pp. 758-762.
- Elfring, C. 1989. Preserving land through local land trusts. **Bioscience.** Vol. 39 (2): pp. 71-74.

- Environment Canada. 1993. **The Nature of Canada. A Primer on Spaces and Species.** The Environmental Citizenship Series. Ottawa: Minister of Supply and Services.
- Environment Canada. 1994. **Reviewing C.E.P.A. The Issues #2. Biodiversity.** Ottawa: Minister of Supply and Services.
- Evans, A. 1992. **Stewardship and Land-Use Planning: A Plan for Action for Nova Scotia Municipalities.** Halifax, Nova Scotia: Eastern Habitat Joint Venture.
- Farris, A. 1981. Successes and Failures: Where From Here? In Dumke, R., Burger, G., and March, J. (Eds.) **Wildlife Management on Private Lands.** Proceedings of: Symposium on Wildlife Management on Private Lands. May 1981. Milwaukee, Wisconsin. Wisconsin: Wildlife Society.
- Featherstone, A. and Goodwin, B. 1993. Factors influencing a farmer's decision to invest in long-term conservation improvements. **Land Economics.** Vol. 69 (1): pp. 67-81.
- Fiedler, P. and Jain, S. (Eds.). 1992. **Conservation Biology. The Theory and Practice of Nature Conservation, Preservation and Management.** New York: Chapman and Hall.
- Filyk, G. 1992. The role of private stewardship in habitat conservation and protection. In Willison et al. (eds.). **Science and the Management of Protected Areas.** New York: Elsevier.
- Financial Post. 1994. **Canadian Markets.**
- Forestry Canada and the Nova Scotia Department of Natural Resources. 1994. **Nova Scotia Forest Management Policy.** Halifax, Nova Scotia: the Nova Scotia Department of Natural Resources.
- Fortman, L. and Kusel, J. 1990. New voices, old beliefs: Forest environmentalism among new and long-standing rural residents. **Rural Sociology.** Vol. 55 (2): pp. 214-232.
- Franklin, J. 1993. Preserving biodiversity: Species, ecosystems, or landscapes. **Ecological Applications.** Vol. 3 (2): pp. 202-205.
- Freedman, B. 1995. **Environmental Ecology: The Ecological Effects of Pollution Disturbance and Other Stresses.** Toronto: Academic Press.
- Geisler, C., Martinson, O., and Wilkening, E. 1977. Outdoor recreation and environmental concern: A restudy. **Rural Sociology.** Vol. 42 (2): pp. 241-249.
- Gobster, P. and Dickhut, K. 1988. Factors influencing landowner acceptance of open space preservation methods. **Society and Natural Resources.** Vol. 1: pp. 351-364.

- Goodier, R. 1986. Rationales for Conservation. In Last, R., Hotz, M., Bell, B. (eds.). **NATO Seminar on Land and its Uses: Actual and Potential: An Environmental Appraisal.** Vol. 10: pp. 259-288.
- Gray, D. 1985. **Ecological Beliefs and Behaviour. Assessment and Change.** Westport, Connecticut: Greenwood Press.
- Griffin, D. 1991. In Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop.** September. 1990. Prince Edward Island. Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Grumbine, R. 1990a. Protecting biological diversity through the greater ecosystem concept. **Natural Areas Journal.** Vol. 10 (3): pp. 114-120.
- Grumbine, R. 1990b. Viable populations, reserve size, and federal lands management: A critique. **Conservation Biology.** Vol. 4 (2): pp. 127-134.
- Gwynne, M. 1982. The Global Environmental Monitoring System (GEMS) of UNEP. **Environmental Conservation.** Vol. 9(1): 35-41.
- Hamilton, L. 1993. **Ethics, Religion and Biodiversity: Relationships Between Conservation and Cultural Values.** Whitehorse, Yukon Territory. The White Horse Press.
- Hamilton, S. and Baxter, D. 1977. In Smith, B. and Walker, M. (Eds.) **Public Property? The Habitat Debate Continued. Essays on the Price, Ownership and Government of Land.** Vancouver: The Fraser Institute.
- Harding, L and McCullum, E. 1994. **Biodiversity in British Columbia: Our Changing Environment.** Ottawa: Environment Canada--Canadian Wildlife Service.
- Harris, G. 1994. Public acquisition versus private stewardship for wetland protection: An evaluation of the St. Lawrence Valley National Wildlife Refuge, USA. **Journal of Environmental Planning and Management.** Vol. 37 (1): pp. 3-20).
- Harvey, J. 1993. Community Involvement in Protecting Natural Areas. In **Protecting our Natural Heritage. The Proceedings of a Workshop on Biodiversity and Protected Areas in Atlantic Canada.** June 1993. Fredericton, N.B.
- Haymond, J. 1990. Wildlife attitudes of early adopters who own forestland. **Society and Natural Resources.** Vol. 3: pp. 11-18.
- Herity, J. 1994. **The Biodiversity Convention Office.** Environment Canada: Ottawa.

- Herman, T. 1993. Involving Communities in Decision-Making. In **Protecting our Natural Heritage. The Proceedings of a Workshop on Biodiversity and Protected Areas in Atlantic Canada**. June 1993. Fredericton, NB.
- Hilts, S. and McLellan, W. 1984. A landowner contact pilot project in Ontario. **Natural Areas Journal**. Vol. 4 (3): pp. 22-25.
- Hilts, S. and Moull, T. 1988. **Protecting Ontario's Natural Heritage Through Private Stewardship**. Waterloo, ON: The Natural Heritage League.
- Hilts, S. 1989a. Private Stewardship. In Hummel, M. (Ed.). **Endangered Spaces. The Future for Canada's Wilderness**. Toronto: Key Porter Books.
- Hilts, S. 1991. Land Stewardship Programs in Ontario. In Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop**. September 1990. Prince Edward Island. Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Hilts, S. 1991b. Hands-on Stewardship. A Training Session. In Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop**. September 1990. Prince Edward Island. Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Hilts, S., Moull, T., Rzakki, J. and Van Patter, M. 1991. **Natural Heritage Landowner Contact Training Manual**. The Natural Heritage League. Guelph: University of Guelph.
- Hilts, S. 1992. Natural Heritage Stewardship Program. In Lerner, S. (Ed.) **Environmental Stewardship. Studies in Active Earthkeeping**. Waterloo: Department of Geography. University of Waterloo.
- Hilts, S. 1993a. Landowner Contact Programs and Private Land Conservation. In Heritage Resources Center. **Ecosystem Management for Managers. Canadian Parks Service National Workshop**. Waterloo: University of Waterloo.
- Hilts, S. 1993b. In Lerner, S. (Ed.) **Environmental Stewardship. Studies in Active Earthkeeping**. Department of Geography: University of Waterloo.
- Hilts, S. and Reid, R. 1993. **Creative Conservation. A Handbook for Ontario Land Trusts**. Federation of Ontario Naturalists.
- Hobbs, R. Saunders, D. and Arnold, G. 1993. Integrated landscape ecology: A Western Australian perspective. **Biological Conservation**. Vol. 64 (3): pp. 231-238.

- Holland, M. 1993. Management of land-inland water ecotones: Needs for regional approaches to achieve sustainable ecological systems. **Hydrobiology**. Vol. 251 (1-3): pp. 331-340.
- Hoose, P. 1981. **Building an Ark: Tools for the Preservation of natural Diversity Through Land Protection**. Covelo, California: Island Press.
- Horwich, R. 1990. How to develop a community sanctuary. An experimental approach to the conservation of private lands. **Oryx**. Vol. 24 (2): pp. 95-102.
- Hudson, W. (Ed.) 1991. **Landscape Linkages and Biodiversity**. Defenders of Wildlife. Washington, DC: Island Press.
- Hummel, M. 1989. Endangered Spaces: Protecting Canada's Remaining Wilderness. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference**. Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Island Nature Trust. **Private Stewardship. The Landowner's Options. A Guide to Voluntary Land Protection**. Prince Edward Island: Island Nature Trust:
- Jackson, E. 1986. Outdoor recreation participation and attitudes toward the environment. **Leisure Studies**. Vol. 5: pp. 1-23.
- Johns, D. 1993. Landscape-scale restoration: The Wildlands Project. **Restoration Management**. Vol. 11 (1): pp. 18-19.
- Kassirer, J. 1996. **Proven Methods for Promoting Environmental Citizenship including Planning Guide, Tools of Change and Case Studies**. Workshop Draft. Ottawa: West End Community Ventures.
- Keating, M. 1989. **Toward a Common Future. A Report on Sustainable Development and Its Implications for Canada**. Ottawa: Environment Canada.
- Keith, T. 1993. **Conserving Private Land: A Role for a Provincial Nature Trust in the Protected Areas System of Nova Scotia**. Masters Thesis. School for Resource and Environmental Studies. Dalhousie University. Halifax, Nova Scotia
- Kellert, S. 1981a. Wildlife and the Private Landowner. In Dumke, R., Burger, G., and March, J. (Eds.) **Wildlife Management on Private Lands**. Proceedings of the Symposium on Wildlife Management on Private Lands. May 1981. Milwaukee, Wisconsin. Wisconsin: Wildlife Society.
- Kellert, S. 1981b. Wildlife and the private landowner. **Wildlife Management on Private Lands**. Proceedings of the Symposium on Wildlife Management on Private Lands. May 1981. Milwaukee, Wisconsin. Wisconsin: Wildlife Society.

- Kim, K. and Weaver, R. 1994. **Biodiversity and Landscapes. A Paradox of Humanity.** Cambridge: Cambridge University Press.
- Kirby, J. 1993. Assessing nature conservation values in British Woodland-A Review of Recent Practice. **Arboricultural Journal.** Vol. 17: pp. 253-276.
- Kish, L. 1965. **Survey Sampling.** New York: Wiley and Sons.
- Kreutzwiser, R. and Pietraszko, L. 1986. Wetland values and protection strategies: A study of landowner attitudes in southern Ontario. **Journal of Environmental Management.** Vol. 22 (1): pp. 13-23.
- Lacey, J., Laursen, S., Gilchrist, J., Brownson, R., Anzick, J. and Doggett, S. 1988. Economic and social implications of managing wildlife on private land in Montana. **Northwest Science.** Vol. 62 (1): pp. 1-9.
- Land Resource Group. 1990. Whither Our Land? Who Owns Nova Scotia? And, What Are They Doing With It? **New Maritimes.** Vol. 8 (6): pp. 14-25.
- Land Trust Alliance. 1993. **Conservation Options. A Landowner's Guide.** Washington, DC: The Land Trust Alliance.
- Large, D. 1973. This land is whose land? Changing concepts of land as property. **Wisconsin Law Review.** Vol. 4: pp. 1039-1083.
- Leduc, J., and Smith, A. 1992. System Planning for Protection-Oriented Provincial Parks in Nova Scotia. In Willison et al. (eds.). **Science and the Management of Protected Areas.** New York: Elsevier.
- Leefe, J. 1992. Nova Scotia has many special places. **Nova Scotia Conservation.** Vol. 16 (4): pp. 8-9.
- Lerner, S. 1994. Local Stewardship: Training Ground for an Environmental Vanguard. **Alternatives.** Vol. 20 (2): pp. 14-19.
- Lichtenberg, E., and Lessley, B. 1992. Water quality, cost-sharing and technical assistance: perceptions of Maryland farmers. **Journal of Soil and Water Conservation.** May-June: pp. 260-264.
- Lind, B. 1991. **The Conservation Easement Stewardship Guide. Designing, Monitoring, and Enforcing Easements.** Washington, DC: Land Trust Alliance.
- Locke, H. and Mathews, M. 1993. Opportunities and Obligations to Protect Ecosystems Under the National Parks Act. In Heritage Resources Center. **Ecosystem Management for Managers. Canadian Parks Service National Workshop.** Waterloo: University of Waterloo.

- Lynch-Stewart, P. 1992. **No Net Loss. Implementing "No Net Loss" Goals to Conserve Wetlands in Canada.** Sustaining Wetlands. Issues Paper 1992-2. Canada: North American Wetlands Conservation Council.
- Lynds, A. and Leduc, J. 1993. Understanding and Protecting Biodiversity at the Landscape Level in Nova Scotia. In **Protecting our Natural Heritage. The Proceedings of a Workshop on Biodiversity and Protected Areas in Atlantic Canada.** June 1993. Fredericton, N.B.
- Lynds, A. and Leduc, J. 1995a. Planning for the Protection of Biodiversity at the Landscape Level in Nova Scotia. In Herman, T., Bondrup-Nielsen, S., Willison, M. and Munro, N. **Ecosystem Monitoring and Protected Areas. Proceedings of the Second International Conference on Science and the Management of Protected Areas.** Dalhousie University, Nova Scotia. May 1995. Wolfville, Nova Scotia: Science and the Management of Protected Areas.
- Lynds, A. and Leduc, J. 1995b. Old Forests of Nova Scotia: Background and Ecological Characteristics. **Natural Resources. Occasional Papers.** No. 1. September 1995.
- MacDonald, P. 1990. **A Wetland Stewardship Program for Nova Scotia. Review and Evaluation Report.** Halifax, Nova Scotia: Wildlife Habitat Canada, Ducks Unlimited (Canada) and Nova Scotia Department of Lands and Forests.
- MacIntosh, P. 1993. **Community Land Trusts: An Alternative Land Use Planning Tool for the Maritimes.** Master of Urban and Rural Planning. Technical University of Nova Scotia. Halifax, Nova Scotia.
- Madsen, C. and Petterson, T. 1987. United States of America Perspective on Landowner Contact Programs. In Wildlife Habitat Canada. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop.** Winnipeg. August 1987. Ottawa: Wildlife Habitat Canada.
- Magurran 1988. **Ecological Diversity and its Measurement.** Princeton, NJ: Princeton University Press.
- Magny, A. 1989. Quebec's Regional Wildlife Habitat Stewardship Programs. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference.** Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Martinka, C. 1992. Conserving the natural integrity of mountain parks: Lessons from Glacier National Park, Montana. **Oecol. Mont.** Vol. 1 (1): pp. 41-48.

- Maynard, L. 1995. Conservation Efforts in Agricultural Landscapes. **National Habitat Workshop. A Practitioner's Look at Habitat Conservation Issues Through Partnerships and Cooperation.** Proceedings. August 1995. Sackville, New Brunswick. Ottawa: Environment Canada and Wildlife Habitat Canada.
- McAllister, D. 1991. Why save biodiversity: Rationale and ethics. **Canadian Biodiversity.** Vol. 1 (4): Winter.
- McCarthy, J. 1991. Sites of special scientific interest: The British experience. **Natural Areas Journal.** Vol. 11 (2): pp. 108-113.
- McCleary, K., Davidson, R. and Beechey, T. 1992. Protecting Ontario's natural diversity through provincial parks and areas of natural and scientific interest. In Willison et al. (eds.). **Science and the Management of Protected Areas.** New York: Elsevier.
- McKenzie-Mohr, D. 1996. **Promoting a Sustainable Future: An Introduction to Community-Based Social Marketing.** Ottawa: National Roundtable on the Environment and the Economy.
- McNamee, K. 1989a. Fighting for the Wild in Wilderness. In Hummel, M. (Ed.). **Endangered Spaces. The Future for Canada's Wilderness.** Toronto: Key Porter Books.
- McNamee, K. 1989b. Sustaining Efforts to Preserve Canada's Wilderness Heritage. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference.** Ottawa-Quebec City-Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- McNamee, K. 1993. From Wild Places to Endangered Spaces. A History of Canada's National Parks. In Dearden, P. and Rollins, R. (Eds.) **Parks and Protected Areas in Canada. Planning and Management.** Toronto: Oxford University Press.
- McNeely, J. 1988. **Economics and Biological Diversity: Executive Summary and Guidelines for Using Incentives** International Union for Conservation of Nature and Natural Resources.
- McNeely, J., Miller, K., Reid, W., Mittermeier, R., and Werner, T. 1990. **Conserving the World's Biological Diversity.** International Union for the Conservation of Nature and Natural Resources, World Resources Institute, Conservation International, World Wildlife Fund-U. S. and the World Bank.
- McNeely, J. and Thorsell, J. 1991. Guidelines for preparing protected areas systems plans. **Parks.** Vol. 2 (2): pp. 4-8.
- McNeely, J. Harrison, P. and Dingwall, P. (eds.). 1994. **Protecting Nature. Regional Reviews of Protected Areas.** The World Conservation Union.: Gland, Switzerland.

- Melnychuk, R. 1987. In Wildlife Habitat Canada. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop.** Winnipeg, Canada. August 1987. Ottawa: Wildlife Habitat Canada.
- Merriam, G. 1993. Landscape Ecology in National Parks Management. In Heritage Resources Center. **Ecosystem Management for Managers. Canadian Parks Service National Workshop.** Waterloo: University of Waterloo.
- Meyer, L. 1984. Landowner contact- A new profession for natural area preservation. **Natural Areas Journal.** Vol. 4 (3): pp. 6-14.
- Minum E. and Clarke, R. 1982. **Elements of Statistical Reasoning.** New York: John Wiley and Sons.
- Milton, R. 1995a. Conference Presentation at **Commitment 2000: Getting There.** White Point Beach Lodge Resort, Nova Scotia. September 1995. Unpublished.
- Milton, R. 1995b. **Private Land Stewardship and Government: Towards a Strategy for Nova Scotia.** Draft Consultation Paper. Kentville, Nova Scotia: Department of Natural Resources and Stewardship Strategy Committee.
- Mitchell, B. and Labaree, J. 1991. **Atlantic Region Stewardship Workshop.** September 1990. Prince Edward Island. Quebec Labrador Foundation. Atlantic Center for the Environment, Environment Canada Conservation and Protection Branch, Wildlife Habitat Canada, Prince Edward Island Department of the Environment.
- Mohai, P. and Twight, B. 1987. Age and environmentalism. An elaboration of the Buttel model using national survey evidence. **Social Science Quarterly.** Vol. 68(4): pp. 798-815.
- Mohai, P. 1992. Men, women, and the environment: An examination of the gender gap in environmental concern and activism. **Society and Natural Resources.** Vol. 5: pp. 1-19.
- Morgan, J. 1985. **An Analysis of Landowner Attitudes Toward Techniques of Wetland Preservation in the Prairie Pothole District of Manitoba.** M.Sc. Thesis, Natural Resources Institute, Winnipeg, Manitoba: University of Manitoba.
- Morgan, J. 1987. Private Stewardship/Landowner Contact: Some Thoughts on its Beginnings, Structure, and use in Canada. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop.** Winnipeg. August 1987. Ottawa: Wildlife Habitat Canada.

- Moull, T. 1987. Ontario's Natural Heritage Stewardship Program. In Wildlife Habitat Canada. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop.** Winnipeg. August 1987. Ottawa: Wildlife Habitat Canada.
- Moull, T. 1989. Private Stewardship Programs in Ontario. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference.** Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Munro, N. 1989. Problems Encountered by Public and Private Agencies in Promoting Preservation of Habitats and Species. **Valuing Special Places and Rare Species.** Proceedings of a Workshop. April 1989. Halifax, Nova Scotia: Dalhousie University, Parks Canada, Nova Scotia Museum and Acadia University.
- Myers, P. 1983. **Lessons from the States. Strengthening Land Conservation Programs Through Grants to Nonprofit Land Trusts.** Washington, DC: Land Trust Alliance.
- National Biodiversity Working Group. 1994. **Canadian Biodiversity Strategy. Canada's Response to the Convention on Biological Diversity.** Ottawa.
- National Roundtable on the Environment and the Economy. 1994. **Project de Societe. Planning for a Sustainable Future. Canadian Choices for Transition to Sustainability.** Ottawa: National Printers.
- Natural Heritage League. Undated. A Landowner Contact Manual. Ontario: Natural Heritage League.
- Nelson, J. 1991. Beyond parks and protected areas: from public and private stewardship to landscape planning and management. **Environments.** Vol. 21 (1): pp. 23-34.
- Nelson, J. 1993. Beyond Parks and Protected Areas. From Public Lands and Private Stewardship to Landscape Planning and Management. In Dearden, P. and Rollins, R. (Eds.) **Parks and Protected Areas in Canada. Planning and Management.** Toronto: Oxford University Press.
- Norton, B. 1986. **The Value of Biological Diversity.** New Jersey: Princeton University Press.
- Norusis, M. J. 1990. **SPSS Guide to Data Analysis for Release 4.** Chicago, Illinois: SPSS, Inc.
- Noss, R. and Cooperrider, A. 1994. **Saving Nature's Legacy. Protecting and Restoring Biodiversity.** Defenders of Wildlife. Island Press: Washington, DC

- Nova Scotia Department of Development. 1986a. **Hants County Statistical Profile.** Nova Scotia: Department of Development.
- Nova Scotia Department of Development. 1986b. **County Profile. Hants.** Nova Scotia: Department of Development.
- Nova Scotia Department of Finance. 1995. **Annapolis Valley Region Statistical Profile.** Nova Scotia Department of Finance. Statistical Division.
- Nova Scotia Department of Industry, Trade and Technology. 1989. **Nova Scotia Statistical Review.** Nova Scotia: Department of Industry, Trade and Technology.
- Nova Scotia Department of Lands and Forests--Parks and Recreation Division and the Department of Education--Nova Scotia Museum. 1984. **Natural History of Nova Scotia.** Volume 2: Theme Regions.
- Nova Scotia Department of Natural Resources. 1995. **Conservation.** Department of Supply and Services.
- Nova Scotia Department of Natural Resources. 1994. **A Proposed Systems Plan for Parks and Protected Areas in Nova Scotia.** Halifax, Nova Scotia: Minister of Supply and Services.
- Nova Scotia Land Use Policy Committee. **Provincial Policies for the Conservation of Wildlife Habitat in Nova Scotia.** Nova Scotia Land Use Policy Committee. Halifax. Nova Scotia.
- Nova Scotia Round Table on Environment and Economy. 1993. **Sustainable Development Strategy for Nova Scotia.**
- O'Connell, M., and Noss, R. 1992. Private land management for biodiversity conservation. **Environmental Management.** Vol. 16 (4): pp. 435-450.
- Ogilvie, R. 1992. Systems planning for ecological sites in Nova Scotia. In Willison, Bondrup-Nielson, Drysdale, Merman, Munro and Pollock (eds.) **Science and the Management of Protected Areas.** New York: Elsevier.
- Ontario Heritage Foundation. 1990. **Options for Landowners. A Guide to the Voluntary Protection of Heritage Properties Along the Niagara Escarpment.** Toronto: The Ontario Heritage Foundation.
- Perrings, C., Folke, C., and Maeler, K. 1992. The ecology and economics of biodiversity loss: The research agenda. **Ambio.** Vol. 21 (3): pp. 201-211.

- Power, T. 1995. The Conservation Easement, A New Tool for Conservation on Private Lands. In (Herman, T., Bondrup-Nielsen, S., Willison, J. and Munro, N. **Ecosystem Monitoring and Protected Areas. Proceedings of the Second International Conference on Science and the Management of Protected Areas.** Dalhousie University, Nova Scotia. May 1995. Wolfville, Nova Scotia: Science and the Management of Protected Areas.
- President's Commission on Environmental Quality. 1993. **Biodiversity on Private Lands.** Washington, DC: President's Commission on Environmental Quality.
- Prince Edward Island Department of Environmental Resources. 1994. **Stewardship and Sustainability. A Renewed Conservation Strategy for PEI.** Prince Edward Island: Department of Environmental Resources.
- Province of British Columbia. 1993. **A Protected Areas Strategy for British Columbia. The Protected Areas Component of British Columbia's land Use Strategy.**
- Public Review Committee for the Proposed Systems Plan for Parks and protected Areas in Nova Scotia. 1995. **Protecting Nova Scotia's Natural Areas. The Report of the Public Review Committee for the Proposed Systems Plans for Parks and Protected Areas in Nova Scotia.** Nova Scotia: Department of Natural Resources.
- Rakowski, P. and Massey, R. 1993. **Proceedings of the First National Habitat Workshop.** April 1993. Winnipeg, Manitoba.
- Rankin, C. and McGonigle, M. 1991. Legislation for biological diversity. A Review and Proposal for British Columbia. **U.B.C. Law Review.** Vol. 25 (2): pp. 277-333.
- Redpath, D. 1974. **Landowners and Land Use in the Musquiduboit Valley Nova Scotia.** Geographical paper No. 55. Environment Canada. Lands Directorate.
- Reid, W. and Miller, K. 1989. **Keeping Options Alive. The Scientific Basis for Conserving Biodiversity.** Washington, DC: World Resources Institute.
- Rhodes, O. and Chesser, R. 1993. Genetic concepts for habitat conservation: The transfer and maintenance of genetic variation. **Management Institute's 58th North American Wildlife and Natural Resources Conference.** March 1993. Washington, DC March.
- Richards, N. 1989. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference.** Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Rickson, R., and Stabler, P. 1985. Community response to non-point pollution from agriculture. **Journal of Environmental Management.** Vol. 20: pp. 281-293.

- Richter, B. 1993. **Ecosystem-level conservation at the Nature Conservancy: Growing Needs for Applied Research in Conservation Biology.** Symposium on Current Issues in Freshwater Conservation at the 40th Annual Meeting of the North American Benthological Society. May 26, 1992. Louisville, Kentucky.
- Rivard, D. 1993. Management Plans and Ecosystem Management: The Need for Rethinking Our Approach. In Heritage Resources Center. **Ecosystem Management for Managers. Canadian Parks Service National Workshop.** Waterloo: University of Waterloo.
- Rolston, H. 1932. **Conserving Natural Value.** Perspectives in Biological Diversity Series. New York: Columbia University Press.
- Rosen, M. and Woodley, S. 1992. A day in the life of the Acadian forest. **Borealis.** Vol. 3 (3): pp. 8-14.
- Rousseau, F. 1990. **Incorporating Local Community Participation in Conservation: The Brier Island Experience.** Masters Thesis. School for Resource and Environmental Studies. Dalhousie University. Halifax, Nova Scotia.
- Rowe, S. 1993. Ecodiversity. The Key to Biodiversity. In **Protecting our Natural Heritage. The Proceedings of a Workshop on Biodiversity and Protected Areas in Atlantic Canada.** June 1993. Fredericton, N.B.
- Rubec, C. 1995. **Developing Incentives and Programs for Conservation on Private Lands.** National Habitat Workshop. Proceedings. A Practitioner's Look at Habitat Conservation Issues Through Partnerships and Cooperation. Sackville, New Brunswick. August. Environment Canada. Wildlife Habitat Canada.
- Russell, R. and Eskowich, K. 1989. **Prairie Pothole Project Phase II: 1988 Annual Report. Report to Wildlife Habitat Canada.** Saskatchewan Parks, Recreation and Culture.
- Ryan, J. 1992. **Life Support: Conserving Biological Diversity.** Worldwatch Paper 108. April. Worldwatch Institute.
- Samdahl, D. and Robertson, R. 1989. Social determinants of environmental concern. Specification and test of the model. **Environment and Behaviour.** Vol. 21 (1): pp. 57-81.
- Sandberg, A. 1992. **Trouble in the Woods. Forest Policy and Social Conflict in Nova Scotia and New Brunswick.** Gorsebrook Research Institute for Atlantic Canada Studies. New Brunswick: Acadiensis Press.
- Sandborn, C. (Ed.). 1990. **Law Reform for Sustainable Development in British Columbia.** British Columbia: Canadian Bar Association.

- Sandlund, O., Hindar, K. and Brown, A. 1992. **Conservation of Biodiversity for Sustainable Development**. New York: Oxford University Press.
- Schahn, J. and Holzer, E. 1990. Studies of individual environmental concern: the role of knowledge, gender, and background variables. **Environment and Behaviour**. Vol. 22 (6): pp. 767-786.
- Scenic Hudson Inc. 1986. **Summary Findings and Conclusions of Survey of Hudson River Corridor Landowners**. Poughkeepsie, NY: Scenic Hudson Inc.
- Scott, D., and Willit, F. 1994. Environment Attitudes and Behaviour: A Pennsylvania Survey. **Environment and Behaviour**. Vol. 26 (2): pp. 239-260.
- Shelton, R. 1981, Motivating the Landowner/manager to Manage for Wildlife. In Dumke, R., Burger, G., and March, J. (eds.) **Wildlife Management on Private Lands**. Proceedings of the Symposium on Wildlife Management on Private Lands. May 1981. Milwaukee, Wisconsin: Wisconsin Wildlife Society.
- Slocombe, D. 1993. Implementing ecosystem-based management. Development of theory, practice and research for planning and managing a region. **Bioscience**. Vol. 43 (9): pp. 612-622
- Small, S. 1992. **Preserving Family Lands. Essential Tax Strategies for the Landowner**. Massachusetts: Landowner Planning Center.
- Smith, D. 1996. Protected Areas Update. **Nova Scotia Conservation**. Nova Scotia Department of Natural Resources.
- Smutko, L. Leitch, J., Danielson, L. and Stroh, R. 1986. **Landowner Attitudes Towards Wetland Preservation Policies in the Prairie Pothole Region**. North Dakota State University. Agricultural Economics Miscellaneous Report no. 78.
- Soule, M. and Wilcox, B. 1980. **Conservation Biology: An Evolutionary-Ecological Perspective**. Massachusetts: Sinauer Associates.
- Soule, M. 1991. Conservation: Tactics for a constant crisis. **Science**. Vol. 253: pp. 744-750.
- Spellerberg, 1992. **Evaluation and Assessment for Conservation. Ecological Guidelines for Determining Priorities for Nature Conservation**. New York: Chapman and Hall.
- Strebig, M. 1988. "Untaxing nature" legislation unveiled (Conservation Land Act: landmark Ontario legislation will remove tax burden from property owners who are protecting valuable natural habitat). **Seasons**. Spring: pp. 7-8.

- Strong, A. 1983. Easements as a development control in the United States. **Landscape Planning**. Vol. 10 (1): pp. 43-64.
- Svoboda, F. 1981. In Dumke, R., Burger, G., and March, J. (Eds.) **Wildlife Management on Private Lands**. Proceedings of: Symposium on Wildlife Management on Private Lands. May 1981. Milwaukee, Wisconsin. Wisconsin Wildlife Society.
- Taschereau, P. 1985. **The Status of Ecological Reserves in Canada**. The Canadian Council on Ecological Areas and the Institute for Resource and Environmental Studies, Dalhousie University.
- Temple, S. 1993. Habitat Fragmentation. In **Proceedings of the First National Wildlife Habitat Workshop**. April 1993. Winnipeg, Manitoba.
- Thompson, B. 1987. Prince Edwards Island's Co-operative Watershed Management Project. In Wildlife Habitat Canada. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop**. Winnipeg, Canada. August 1987. Ottawa: Wildlife Habitat Canada.
- Tingly, D., Kirby, R., and Hupfer, R. 1986. **Conservation Kit: A Legal Guide to Private Conservancy**. Edmonton: Environmental Law Center (Alberta) Society.
- Trombetti, O. and Cox, K. 1990. **Land, Law and Wildlife Conservation: The Role and Use of Conservation Easements and Covenants in Canada**. Reference Paper No. 3. Ottawa: Wildlife Habitat Canada.
- Tremblay, K. Jr. and Dunlap, R. 1978. Rural-urban residence and concern with environmental quality: A replication and extension. **Rural Sociology**. Vol. 43: pp. 474-491.
- Turner, A., Rubec, C., and Wiken, E. Canadian Ecosystems. 1992. A systems approach to their conservation. In Willison, Bondrup-Nielson, Drysdale, Merman, Munro and Pollock (eds.) **Science and the Management of Protected Areas**. New York: Elsevier.
- Ungar, S. 1994. Apples and oranges: Probing the attitude-behaviour relationship for the environment. **Canadian Review of Sociology and Anthropology**. Vol. 31(3): pp. 288-304.
- United Nations, 1992. **Code of Practice for the Conservation of Threatened Animals and Plants and Other Species of International Significance**. New York.
- Van Liere, K. and Dunlap, R. 1978. The new environmental paradigm. A proposed measuring instrument and preliminary results. **Journal of Environmental Education**. Vol. 9: pp. 119.

- Van Liere, K. and Dunlap, R. 1980. The Social bases of environmental concern: A Review of hypotheses, explanations and empirical evidence. **Public Opinion Quarterly**. Vol. 44: pp. 181-197.
- Van Liere, K. and Dunlap, R. 1981. Environmental concern. Does it make a difference how it is measured? **Environment and Behaviour**. Vol. 13 (6): pp. 651-676. 1980 1981
- Van Patter, M., and Hilts, S. 1990. Natural heritage protection: Voluntary stewardship or planning control? **Plan Canada**. Vol. 30: pp. 20-28.
- Van Patter, M., Geerts, H., and Hilts, S. 1990. Enhancing private land stewardship. **Natural Areas Journal**. Vol. 10 (3): pp. 121-128.
- Van Vuuren, W. and Roy, P. 1993. Private and social returns from wetland preservation versus those from wetland conversion to agriculture. **Ecological Economics**. Vol. 8 (3): pp. 289-305.
- Vaughan Shand, G. 1979. **Historic Hants County**. Halifax, Nova Scotia: Patheric Press.
- Waddell, J. 1989. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference**. Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Waddell, J. 1990. **Final Report of the Island Nature Trust Landowner Contact Program**. Submitted to Wildlife Habitat Canada. January 1990.
- Walker, D. and Zeller, M. 1985. Promoting public/private initiatives for preservation: Colorado open lands. **Urban Land**. November 41 (6).
- Weatherill, R. 1989. Regional Stewardship Programs in the Prairies. In Nelson, J. and Woodley, S. (eds.) **Heritage Conservation and Sustainable Development Conference**. Ottawa-Quebec City- Tadoussac. May 14-19. Occasional Paper 16. Waterloo: Heritage Resources Center, University of Waterloo.
- Weigel, R., and Weigel, J. 1978. Environmental concern: The development of a measure. **Environment and Behaviour**. Vol. 10 (1): pp. 3-15.
- Wells, M. 1992. Biodiversity conservation, affluence and poverty: Mismatched costs and benefits and efforts to remedy them. **Ambio**. Vol. 21 (3): pp. 237-243.
- Wells, M. 1993. The principles and practice of buffer zones and local participation in biodiversity conservation. **Ambio**. Vol. 22 (2-3): pp. 157-162.

- Wellstead, A. and Brown, Dr. P. 1993. **Nova Scotia Woodlot Owner Survey Report.** Nova Scotia Department of Natural Resources and Dalhousie University.
- Western, D. 1992. The biodiversity crisis: A challenge for biology. **Oikos.** Vol. 63 (1): pp. 29-38.
- Westman, W. 1990. Managing for biodiversity. **Bioscience.** Vol. 40 (1): pp. 26-33.
- Wildlife Advisory Council. 1993. **Living with Wildlife: A Strategy for Nova Scotia.** Halifax, Nova Scotia: Canada/Nova Scotia Cooperation Agreement for Forestry Development.
- Wildlife Habitat Issue Group. 1984. **Tools for the Management of Wildlife Habitat in Nova Scotia.** Background Report. Halifax, Nova Scotia: Nova Scotia Land Use Policy Committee.
- Wildlife Habitat Issue Group. 1985. **Provincial Policies for the Conservation of Wildlife Habitat in Nova Scotia.** Halifax, Nova Scotia: Nova Scotia Land Use Policy Committee.
- Wildlife Habitat Issue Group. 1994. **Nova Scotia Wildlife Habitat Conservation Manual.** Halifax, Nova Scotia: Nova Scotia Land Use Committee.
- Wildlife Habitat Canada. 1987. **Wildlife Conservation on Private Lands. Proceedings of the Private Stewardship/Landowner Contact Workshop.** Winnipeg, Manitoba. August 1987. Ottawa: Wildlife Habitat Canada.
- Williams, S. and McCrorie, R. 1990. The analysis of ecological attitudes in town and country. **Journal of Environmental Management.** Vol. 31: pp. 157-162.
- Willis, K., Benson, J. and Saunders, C. 1988. The impact of agricultural policy on the costs of nature conservation. **Land Economics.** 64 (2): pp. 147-157.
- Woodley, S. 1993. Understanding Ecological Integrity and National Parks. In Heritage Resources Center. **Ecosystem Management for Managers. Canadian Parks Service National Workshop.** Waterloo: University of Waterloo.
- Woodley, S., Kay, J. and Francis, G. 1993. (Eds.) **Ecological Integrity and the Management of Ecosystems.** Ottawa: St. Lucie Press. Heritage Resources Center, University of Waterloo and Canadian Parks Service.
- World Commission on Environment and Development. 1987. **Our Common Future.** Oxford, NY: Oxford University Press.

World Conservation Union, United Nations Environment Program and the World Wide Fund for Nature. 1991. **Caring for the Earth. A Strategy for Sustainable Living.** Gland, Switzerland.

World Resources Institute, International Union of Conservation for Nature, the United Nations Environment Program, Federation of Agricultural Organizations, and the United Nations Educational, Scientific, and Cultural Organization. 1992. **Global Biodiversity Strategy. Guidelines for Acting to Save, Study and Use Earth's Biotic Wealth Sustainably and Equitably.**

World Wildlife Fund Canada. 1991. **Endangered Spaces. Progress Report.** Number 2. Ottawa, ON: World Wildlife Fund Canada.

World Wildlife Fund Canada. 1992. **Endangered Spaces. Progress Report.** Number 3. Ottawa, ON: World Wildlife Fund Canada.

Personal Communication

Boates, Dr. Sherman. Wildlife Department. Nova Scotia Department of Natural Resources. Kentville, Nova Scotia.

Crowell, Art. Wildlife Technician. Hants County. Nova Scotia Department of Natural Resources.

Downe, D. 1996. Presentation at the Public Review Committee's Report on the Parks and Protected Areas Systems Plan Public Review Process.

Gilles, Hugh. Municipality of West Hants. Planning Division. Windsor, Nova Scotia.

Griffin, Diane. Deputy Minister of Environment. PEI Department of the Environment. Charlottetown, Prince Edward Island.

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NATURE CONSERVATION ON PRIVATE LANDS

The purpose of this survey is to understand how landowners feel about nature conservation on private land, and to find ways of supporting interested landowners. The questions simply require you to circle your answer or write a short response. It should take about one hour. If you wish to comment on any questions or explain your answers, please feel free to use the space in the margins or additional paper. All of your comments, favourable or unfavourable toward conservation, are important. Please remember that there are no right or wrong answers, and that your responses are completely confidential, so respond as honestly and accurately as you can.

For this survey, **NATURE CONSERVATION** means looking after the land to protect and preserve its natural values. It can range from managing land for wildlife and habitat, or working with a conservation group to protect land, to donating, leasing or selling land to a conservation organization or agency.

Thank you for your help. If you have any questions or concerns please call me collect after 6 p.m. at (902) 868-1352.

Bonnie Sutherland
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How do you feel about the Environment and Conservation?

Please read the following statements and indicate how strongly you agree or disagree by circling the appropriate number beside the statement.

1=strongly disagree
2=disagree
3=unsure
4=agree
5=strongly agree

- | | | | | | |
|---|---|---|---|---|---|
| 1. Plants and animals exist mainly to be used by humans | 1 | 2 | 3 | 4 | 5 |
| 2. The balance of nature is very delicate and easily upset | 1 | 2 | 3 | 4 | 5 |
| 3. People have the right to change the natural environment to suit their needs | 1 | 2 | 3 | 4 | 5 |
| 4. The earth is like a spaceship with only limited room and resources | 1 | 2 | 3 | 4 | 5 |
| 5. Humans are severely abusing the environment | 1 | 2 | 3 | 4 | 5 |
| 6. We are approaching the maximum number of people the earth can support | 1 | 2 | 3 | 4 | 5 |
| 7. I am concerned about the future of the natural environment in Nova Scotia | 1 | 2 | 3 | 4 | 5 |
| 8. I think nature conservation is important | 1 | 2 | 3 | 4 | 5 |
| 9. I think there are too many restrictions on private landowners due to environmental concerns | 1 | 2 | 3 | 4 | 5 |
| 10. Landowners have a right to do what they want on their own land | 1 | 2 | 3 | 4 | 5 |
| 11. Landowners have a responsibility to take care of their lands to protect nature | 1 | 2 | 3 | 4 | 5 |
| 12. How we use our private land affects other people's land | 1 | 2 | 3 | 4 | 5 |
| 13. I think private lands are important for effective nature conservation in Nova Scotia | 1 | 2 | 3 | 4 | 5 |
| 14. Landowners should be encouraged to manage their resources in a sustainable way so that the resources are available for future generations | 1 | 2 | 3 | 4 | 5 |
| 15. Landowners should be encouraged to protect and preserve important natural features like rare plants, and natural undeveloped areas on their lands | 1 | 2 | 3 | 4 | 5 |
| 16. Landowners should <u>not</u> have to preserve natural areas and special features on their lands because we have parks on public lands for nature preservation | 1 | 2 | 3 | 4 | 5 |
| 17. I am interested in practising conservation on my own land if it does not interfere with my use of resources (eg. woodlot use) | 1 | 2 | 3 | 4 | 5 |
| 18. I am interested in practising conservation on my land strictly for nature's sake, even if it means giving up certain land and resource uses | 1 | 2 | 3 | 4 | 5 |

How important is each of these items in limiting or discouraging you from practising nature conservation on your lands?

1=not important at all
2=not very important
3=unsure
4=somewhat important
5=very important
NA= does not apply to me

1. The need to make money from my land	1	2	3	4	5	NA
2. My belief that I have a right to do what I want with my land	1	2	3	4	5	NA
3. My desire to be independent in how I manage my land (not to be told what to do)	1	2	3	4	5	NA
4. Other priorities	1	2	3	4	5	NA
5. My lack of trust of the "the government"	1	2	3	4	5	NA
6. I have not really thought about it and am not sure what is involved in conservation	1	2	3	4	5	NA
7. My lack of time to be involved in conservation	1	2	3	4	5	NA
8. My fear that conservation will cost me a lot of effort, time and money and other people will get all the benefits	1	2	3	4	5	NA
9. Difficulty getting my family members to agree to protect the land for nature conservation	1	2	3	4	5	NA
10. My concern about restricting my land and resource uses	1	2	3	4	5	NA
11. My concern about how long I would have to agree to conserve my land	1	2	3	4	5	NA
12. My lack of trust that conservation programs will protect my land in the future	1	2	3	4	5	NA
13. Competing incentives from other land uses (like payments by forestry companies to log my land)	1	2	3	4	5	NA
14. A lack of landowner consultation involved in a conservation program	1	2	3	4	5	NA
15. Tax penalties for donating or selling land or interests in land for conservation	1	2	3	4	5	NA
16. Fear of liability if other people are using my land for recreation	1	2	3	4	5	NA
17. A lack of satisfaction with private land conservation options (programs, agreements)	1	2	3	4	5	NA
18. A lack of satisfaction with the organizations offering programs and assistance	1	2	3	4	5	NA

Are there any other influences that could either encourage or limit your participation in private land conservation? Or influence private land conservation in Nova Scotia generally?

How do you recommend enhancing private land conservation in Nova Scotia?

Thinking about the influences that could encourage or limit your participation in private land conservation, please indicate how important you consider each of the following items for ensuring successful private land conservation in Nova Scotia.

1=not important
2=not very important
3=unsure
4=somewhat important
5=very important

How important is providing landowners with information on:

- | | |
|--|-------|
| a. The values of conservation | 1 2 3 |
| b. The benefits of private land conservation | 1 2 3 |
| c. The areas of importance to conservation on their own property | 1 2 3 |
| d. How to manage land for conservation | 1 2 3 |
| e. Specific options available for landowners (programs, contacts, incentives etc.) | 1 2 3 |

How important is providing assistance through:

- | | |
|--|---------|
| a. Cash incentives to encourage landowners to become involved | 1 2 3 4 |
| b. Small grants for restoring or maintaining natural areas | 1 2 3 4 |
| c. Property tax breaks for conservation of significant natural areas | 1 2 3 4 |
| d. Income tax breaks for conservation of significant natural areas | 1 2 3 4 |
| e. Large grants to cover land management costs | 1 2 3 4 |
| f. Cost sharing for management assistance | 1 2 3 4 |
| g. Conservation awards and public recognition to landowners who participate | 1 2 3 4 |
| h. Incentives (financial or non-financial) that fit the level of commitment involved | 1 2 3 4 |

How do you feel about different conservation strategies?

How do you feel about each of these strategies for nature conservation on private lands? Please circle the appropriate number beside the statement.

1=highly unfavourable
2=unfavourable
3=unsure
4=favourable
5=highly favourable

- | | |
|--|-------------------|
| 1. Landowner contact program (people contact landowners with land of conservation value, provide information, advice, deal with concerns etc.) | 1 2 3 4 5 |
| 2. Handshake conservation agreement (agree to protect the land for a set time period and give notice of threats to the area, and any changes in land use or ownership) | 1 2 3 4 5 |
| 3. Written conservation agreement (the same as a handshake agreement but the agreement is recorded and signed) | 1 2 3 4 5 |
| 4. Management agreement (a stronger agreement in which the landowner follows a specific management plan in exchange for management advice and assistance) | 1 2 3 4 5 |
| 5. Lease (land is leased to a conservation organization who then have a right to enter the land and manage it according to the agreed terms) | 1 2 3 4 5 |
| 6. Conservation easement (a long-term legal agreement which restricts certain activities on the land in exchange for lower property and income taxes) | 1 2 3 4 5 |
| 7. Sale of land or parts of land to a volunteer conservation group | 1 2 3 4 5 |
| 8. Sale of land or parts of land to government agency | 1 2 3 4 5 |
| 9. Donation (donate land or certain land rights to a conservation organization with resulting income and property tax benefits) | 1 2 3 4 5 |
| 10. Donation (donate land or certain land rights to a government agency with resulting income and property tax benefits) | 1 2 3 4 5 |
| 11. A formal agreement to give a conservation organization the option to buy land before any other buyer, for full market value, if the landowner decided to sell | 1 2 3 4 5 |
| 12. Donation in will (donate land or certain land rights to a conservation organization and receive lower estate taxes) | 1 2 3 4 5 |
| 13. Land use zoning and regulations for conservation (to control the use and development on private lands) | 1 2 3 4 5 |

Do you have any comments on the conservation strategies or organizations that you prefer or oppose for conservation on private lands?

What is your involvement in nature-based activities?

Please circle the letter beside your answer. You may circle more than one answer.

1. Do you participate in nature-related recreational activities?

- a. No
- b. Yes-hunting, fishing, or trapping activities
- c. Yes-other activities (hiking, wildlife watching, art, camping etc.)

2. Are you involved in any wildlife or conservation-related organizations? (Ducks Unlimited, local fish and game association, naturalists clubs, nature trusts etc.)

- a. No
- b. Yes (please print the names of the organizations) _____

3. Are you practicing any conservation activities on your land or managing for wildlife?

- a. None
- b. Sustainable resource use (eg. sustainable forestry, conservation farming techniques)
- c. Habitat improvement (eg. nesting boxes, planting native trees, protecting wetlands, streams etc.)
- d. Considering wildlife habitat and other natural features in how you use land and resources
- e. Leaving natural areas alone for conservation purposes
- f. Other (please explain) _____

4. What do you think will happen to the natural areas on your property over the next 25 years (Circle more than one if needed)

- a. Sold for cash
- b. Converted to other uses (eg. housing, logging, agriculture)
- c. Left alone for conservation reasons
- d. Some areas used for production (eg. soil excavation, firewood cutting)
- e. Managed for conservation/wildlife
- f. Given to heirs
- g. Other (please explain) _____

5. Are you involved in any resource management or conservation projects with a government agency or organization? (eg. Ducks Unlimited, Nature Conservancy, Department of Natural Resources etc.)

- a. No
- b. Yes (please list names of projects or organizations) _____

6. If you have been involved in resource management or private land conservation programs before, what were your experiences? Please comment on organizations, programs, agreements etc. and include positive and negative experiences

What is your level of knowledge about nature conservation?

Please indicate your level of knowledge or familiarity with each item by circling the appropriate number beside the item.

1=very low/none
2=low
3=unsure
4=high
5=very high

- | | | | | | |
|---|---|---|---|---|---|
| 1. How to practise nature conservation on private land | 1 | 2 | 3 | 4 | 5 |
| 2. The science of nature conservation (how the natural world works, the functions of nature, the links between natural processes and human activities etc.) | 1 | 2 | 3 | 4 | 5 |
| 3. Wetland conservation programs offered by Ducks Unlimited | 1 | 2 | 3 | 4 | 5 |
| 4. Nature conservation options offered by the Nature Conservancy, Land Trusts or other private conservation groups | 1 | 2 | 3 | 4 | 5 |
| 5. Resource management options offered by the government or private organizations (eg. woodlot management, conservation farming practices etc.) | 1 | 2 | 3 | 4 | 5 |
| 6. Nature conservation options offered by the government (eg. Special Places Program etc.) | 1 | 2 | 3 | 4 | 5 |
| 7. Alternatives available for landowners interested in private land conservation (eg. easements, agreements, options for donations etc.) | 1 | 2 | 3 | 4 | 5 |

What is important to you in thinking about practising nature conservation on your lands?

How important is each of these items in encouraging you to practise nature conservation on your lands? Please indicate your answer by circling the appropriate number beside each item.

1=not important at all
2=not very important
3=unsure
4=somewhat important
5=very important
NA=does not apply to me

- | | | | | | | |
|--|---|---|---|---|---|----|
| 1. Protecting land for my children in the future | 1 | 2 | 3 | 4 | 5 | NA |
| 2. Maintaining family heritage/tradition | 1 | 2 | 3 | 4 | 5 | NA |
| 3. My concern about nature | 1 | 2 | 3 | 4 | 5 | NA |
| 4. Financial incentives (tax breaks, compensation etc.) | 1 | 2 | 3 | 4 | 5 | NA |
| 5. Other incentives (recognition, awards, information) | 1 | 2 | 3 | 4 | 5 | NA |
| 6. Economic security/income for the future | 1 | 2 | 3 | 4 | 5 | NA |
| 7. Wildlife protection | 1 | 2 | 3 | 4 | 5 | NA |
| 8. Protecting other conservation values (protecting streams, plants , natural cycles etc.) | 1 | 2 | 3 | 4 | 5 | NA |
| 9. My feeling of being responsible for protecting natural areas on my land | 1 | 2 | 3 | 4 | 5 | NA |
| 10. Providing hunting, fishing, or trapping opportunities | 1 | 2 | 3 | 4 | 5 | NA |
| 11. Providing other recreation opportunities (hiking, picnics, photography etc.) | 1 | 2 | 3 | 4 | 5 | NA |
| 12. Providing wildlife viewing opportunities | 1 | 2 | 3 | 4 | 5 | NA |
| 13. Protecting natural beauty, scenery | 1 | 2 | 3 | 4 | 5 | NA |
| 14. Protecting useful products (trees, genetic information etc.) | 1 | 2 | 3 | 4 | 5 | NA |
| 15. Assurance that my land is protected in the future when I no longer control it | 1 | 2 | 3 | 4 | 5 | NA |
| 16. The opportunity to learn about nature conservation | 1 | 2 | 3 | 4 | 5 | NA |
| 17. The opportunity to increase community awareness of nature conservation | 1 | 2 | 3 | 4 | 5 | NA |
| 18. The value of my land for conservation | 1 | 2 | 3 | 4 | 5 | NA |
| 19. Whether or not my friends, neighbours or relatives have conserved their land | 1 | 2 | 3 | 4 | 5 | NA |

1=not important at all
 2=not very important
 3=unsure
 4=somewhat important
 5=very important

How important is providing these particular programs and services:

- | | | | | |
|--|---|---|---|---|
| a. A landowner contact program to support landowners (people getting in touch with owners of important land, answering questions, providing information) | 1 | 2 | 3 | 4 |
| b. A variety of conservation options to meet different landowner needs/interests | 1 | 2 | 3 | 4 |
| c. A variety of organizations to meet different landowner needs/interests | 1 | 2 | 3 | 4 |
| d. Consultation with landowners in designing programs, options, and incentives | 1 | 2 | 3 | 4 |
| e. An easy and uncomplicated process for landowner involvement in conservation | 1 | 2 | 3 | 4 |
| f. Knowledgeable advisors in the organizations supporting landowners | 1 | 2 | 3 | 4 |
| g. Information presented in a format that allows landowners to learn about options and make decisions on their own | 1 | 2 | 3 | 4 |
| h. Coordination of the efforts of the various conservation organizations (goals, programs, information provided to landowners, contact with landowners etc.) | 1 | 2 | 3 | 4 |
| i. A variety of approaches to providing information including pamphlets, books, public education workshops, slide shows, personal interviews etc. | 1 | 2 | 3 | 4 |
| j. A strong commitment from conservation organizations and agencies (time, funding, staff) | 1 | 2 | 3 | 4 |
| k. Other support for private land conservation (legal, economic, social, policy) | 1 | 2 | 3 | 4 |
| l. Flexibility in the length of time involved in a conservation agreement | 1 | 2 | 3 | 4 |

If you were to enter into a conservation agreement, what time period would you prefer? Please circle the letter of your answer.

- a) no interest b) less than 10 years c) 10-25 years d) permanent

What else do you think could be done to improve private land conservation in Nova Scotia, and ensure its success? (or increase the chances of landowners like you becoming involved?)

Who do you think should be involved in private land conservation programs and services?

Please circle the letters of answers that apply for each question. You may circle more than one answer.

Who should provide private land conservation programs (education, information and advice) for landowners?

- a. Federal government (eg. Canadian Wildlife Service)
- b. Provincial government (eg. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (eg. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

Who should provide funding for private land conservation?

- a. Federal government (eg. Canadian Wildlife Service)
- b. Provincial government (eg. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (eg. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

Who should be responsible for actual land management?

- a. Federal government (eg. Canadian Wildlife Service)
- b. Provincial government (eg. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (eg. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

Who should be responsible for holding conservation agreements with landowners?

- a. Federal government (eg. Canadian Wildlife Service)
- b. Provincial government (eg. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (eg. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

General questions about you and your land

1. How much land do you own?
a. Under 50 ha (125 ac) b. 50-200 ha (125-500 ac) c. Over 200 ha (500 ac)
2. About how many hectares (or acres) of your land are used for each of the following?
_____ Natural area (undeveloped)
_____ Developed areas (agriculture, woodlot, houses and buildings etc.)
3. How important is your land in helping you and your family to make a living?
a. Not at all b. Somewhat important c. Very important
4. Do you think that your land may have any special features or values for conservation?
a. Yes-natural areas or special features (important plants, animals, habitats or landscapes or importance as part of a bigger natural area or link to other areas etc.)
b. No special features or values for conservation
5. How many years have you been a landowner? a. less than 5 years b. 5-10 years c. over 10 years
6. How did you acquire your land?
a. Through Family (inheritance or purchase) b. Bought on the real estate market
7. Do you live on your rural property?
a. Yes -year round b. Yes -seasonally c. No
8. Gender a. male b. female
9. Age a. Under 30 b. 30-50 c. over 50
10. Marital Status a. single b. married or common-law c. widowed d. divorced
11. Do you have any children? a. No b. Yes
12. Occupation _____
13. Annual Income a. under \$15,000 b. \$15,000-24,999 c. \$25,000-35,000 d. over \$35,000
14. Education a. grade 8 b. Some high school c. High school diploma d. Technical/trades training
e. college/university
15. What do you consider to be your background? (where you were raised?) .
a. Rural/farm b. Small town (up to 5000 people) c. Urban (over 5000 people)

Is there anything else you would like to tell me about conservation on private lands? Any comments you wish to make that you think may help in future efforts would be appreciated here or in a separate letter.

Please sign the consent card to allow me to use your answers in the survey. I will keep the consent card separate from your questionnaire, so your questionnaire will not have your name on it and your answers will be anonymous. If you would like a copy of the results please check the "yes" box on the consent card. Also, if you would like a follow-up interview to talk about any of these issues further, please check the appropriate "yes" box on the consent card.

Thank you for participating.

ENHANCING PRIVATE LAND CONSERVATION IN NOVA SCOTIA

The purpose of this survey is to better understand attitudes about nature conservation on private land, obstacles to such conservation and methods of enhancing it. The questions simply require you to circle your answer or write a short response. If you wish to comment on any questions or explain your answers, please feel free to use the space in the margins, on the last page, or additional paper. All of your comments are important. Please remember that there are no right or wrong answers, and that your responses are completely confidential, so respond as honestly and accurately as you can.

For this survey, **NATURE CONSERVATION** means looking after the land to protect and preserve its natural values. It can range from managing land for wildlife and habitat, or working with a conservation group to protect land and preserve its natural values, to donating, leasing or selling land to a conservation organization or agency.

Thank you for your help. If you have any questions or concerns please call me collect after 6 p.m. at (902) 868-1352.

Bonnie Sutherland
School for Resource and
Environmental Studies
1312 Robie Street
Halifax, Nova Scotia
B3H 3E2



INCENTIVES FOR PARTICIPATION IN PRIVATE LAND CONSERVATION

Based on your own experiences, how important do you consider each of these items in encouraging landowners to participate in private land conservation in Nova Scotia?

Please circle the appropriate number beside each item.

1=not important at all
2=not very important
3=unsure
4=somewhat important
5=very important

- | | | | | | |
|--|---|---|---|---|---|
| 1. Protecting land for children in the future | 1 | 2 | 3 | 4 | 5 |
| 2. Maintaining family heritage/tradition | 1 | 2 | 3 | 4 | 5 |
| 3. Concern about nature | 1 | 2 | 3 | 4 | 5 |
| 4. Financial incentives (tax breaks, compensation etc.) | 1 | 2 | 3 | 4 | 5 |
| 5. Other incentives (recognition, awards, information) | 1 | 2 | 3 | 4 | 5 |
| 6. Economic security/income for the future | 1 | 2 | 3 | 4 | 5 |
| 7. Wildlife protection | 1 | 2 | 3 | 4 | 5 |
| 8. Protecting other conservation values (protecting streams, plants , natural cycles etc.) | 1 | 2 | 3 | 4 | 5 |
| 9. A feeling of being responsible for protecting natural areas on their land | 1 | 2 | 3 | 4 | 5 |
| 10. Providing hunting, fishing, or trapping opportunities | 1 | 2 | 3 | 4 | 5 |
| 11. Providing other recreation opportunities (hiking, picnics, photography etc.) | 1 | 2 | 3 | 4 | 5 |
| 12. Providing wildlife viewing opportunities | 1 | 2 | 3 | 4 | 5 |
| 13. Protecting natural beauty, scenery | 1 | 2 | 3 | 4 | 5 |
| 14. Protecting useful products (trees, genetic information etc.) | 1 | 2 | 3 | 4 | 5 |
| 15. Assurance that the land is protected in the future when they no longer control it | 1 | 2 | 3 | 4 | 5 |
| 16. The opportunity to learn about nature conservation | 1 | 2 | 3 | 4 | 5 |
| 17. The opportunity to increase community awareness of nature conservation | 1 | 2 | 3 | 4 | 5 |
| 18. The value of the land for conservation (special features, uniqueness etc.) | 1 | 2 | 3 | 4 | 5 |
| 19. Whether or not friends, neighbours or relatives have conserved their land | 1 | 2 | 3 | 4 | 5 |

Are there any other things that you think encourage landowners to participate in private land conservation?

CHALLENGES FACING LANDOWNER PARTICIPATION IN PRIVATE LAND CONSERVATION

Based on your own experiences, how important do you consider each of these items in limiting or discouraging landowners from participating in private land conservation in Nova Scotia?

1=not important at all
2=not very important
3=unsure
4=somewhat important
5=very important

- | | | | | | |
|--|---|---|---|---|---|
| 1. The need to make money from their land | 1 | 2 | 3 | 4 | 5 |
| 2. A belief that they have a right to do what they want with their land | 1 | 2 | 3 | 4 | 5 |
| 3. A desire to be independent in how they manage their land (not to be told what to do) | 1 | 2 | 3 | 4 | 5 |
| 4. Other priorities | 1 | 2 | 3 | 4 | 5 |
| 5. A lack of trust of the "the government" | 1 | 2 | 3 | 4 | 5 |
| 6. A lack of time to be involved in conservation | 1 | 2 | 3 | 4 | 5 |
| 7. A fear that conservation will cost a lot of effort, time and money and other people will get all the benefits | 1 | 2 | 3 | 4 | 5 |
| 8. Difficulty getting family members to agree to protect the land for nature conservation | 1 | 2 | 3 | 4 | 5 |
| 9. A concern about restricting land and resource uses | 1 | 2 | 3 | 4 | 5 |
| 10. A concern about the length of commitment involved | 1 | 2 | 3 | 4 | 5 |
| 11. A lack of trust that conservation programs will protect land in the future | 1 | 2 | 3 | 4 | 5 |
| 12. Competing incentives from other land uses (like payments by forestry companies to log their land) | 1 | 2 | 3 | 4 | 5 |
| 13. A lack of landowner consultation involved in a conservation program | 1 | 2 | 3 | 4 | 5 |
| 14. Tax penalties for donating or selling land or interests in land for conservation | 1 | 2 | 3 | 4 | 5 |
| 15. Fear of liability if other people are using their land for recreation | 1 | 2 | 3 | 4 | 5 |
| 16. A lack of satisfaction with private land conservation options (programs, agreements) | 1 | 2 | 3 | 4 | 5 |
| 17. A lack of satisfaction with the organizations offering programs and assistance | 1 | 2 | 3 | 4 | 5 |
| 18. A lack of landowner knowledge about the values of conservation (why it is important, why private land is needed for conservation etc.) | 1 | 2 | 3 | 4 | 5 |

19. A lack of landowner knowledge about options for private land conservation (programs, organizations, contacts, incentives, how to manage land for conservation)	1	2	3	4	5
20. A lack of environmental concern/ethic among landowners	1	2	3	4	5
21. A lack of landowners' recognition of the value of their land for conservation	1	2	3	4	5
22. The complexity of existing conservation agreements	1	2	3	4	5
23. A lack of adequate financial incentives	1	2	3	4	5
24. A lack of adequate social incentives (landowner awards and public recognition)	1	2	3	4	5
25. A lack of adequate educational incentives (information, advice)	1	2	3	4	5

Are there any other things that you think limit or discourage participation in private land conservation? Please explain.

CHALLENGES FACING PRIVATE LAND CONSERVATION EFFORTS

How important do you consider each of these items in limiting or discouraging private land conservation generally in Nova Scotia?

1=not important at all
2=not very important
3=unsure
4=somewhat important
5=very important

- | | | | | | |
|--|---|---|---|---|---|
| 1. A lack of scientific data and information on which to base private land conservation | 1 | 2 | 3 | 4 | 5 |
| 2. A lack of communication with private landowners | 1 | 2 | 3 | 4 | 5 |
| 3. The varied goals of different organizations for private land and resources | 1 | 2 | 3 | 4 | 5 |
| 4. Lack of inter-department and inter-agency coordination of goals, programs, approaches | 1 | 2 | 3 | 4 | 5 |
| 5. Lack of adequate coordination of efforts and mechanisms for coordination between government and non-governmental organizations and community groups | 1 | 2 | 3 | 4 | 5 |
| 6. A lack of adequate commitment to private land conservation from conservation organizations and government agencies (staff, time, funding) | 1 | 2 | 3 | 4 | 5 |
| 7. Lack of adequate skill and experience among personnel of conservation organizations and agencies | 1 | 2 | 3 | 4 | 5 |
| 8. The lack of permanency of private land conservation programs/efforts | 1 | 2 | 3 | 4 | 5 |
| 9. Property tax implications for non-governmental organizations | 1 | 2 | 3 | 4 | 5 |
| 10. The complexity of existing conservation agreements | 1 | 2 | 3 | 4 | 5 |
| 11. A lack of "common ground" amongst the various groups and individuals with an interest in private land conservation | 1 | 2 | 3 | 4 | 5 |
| 12. A lack of legal and policy support for private land conservation | 1 | 2 | 3 | 4 | 5 |
| 13. A lack of adequate knowledge about the science of conservation among personnel in conservation organizations and agencies | 1 | 2 | 3 | 4 | 5 |
| 14. A lack of adequate knowledge about options for private land conservation among personnel in conservation organizations and agencies | 1 | 2 | 3 | 4 | 5 |

Are there any other things that you think limit or discourage private land conservation in Nova Scotia? Please explain.

RECOMMENDATIONS FOR ENHANCING PRIVATE LAND CONSERVATION IN NOVA SCOTIA

Thinking about the influences that could encourage or limit private land conservation, please indicate how important you consider each of the following items for ensuring successful private land conservation in Nova Scotia.

1=not important at all
2=not very important
3=unsure
4=somewhat important
5=very important

How important is providing landowners with information on:

- | | |
|--|-------------------|
| a. The values of conservation in general | 1 2 3 4 5 |
| b. The benefits of private land conservation | 1 2 3 4 5 |
| c. The areas of importance to conservation on their own property | 1 2 3 4 5 |
| d. How to manage land for conservation | 1 2 3 4 5 |
| e. Specific options available for landowners (programs, contacts, incentives etc.) | 1 2 3 4 5 |

How important is providing assistance through:

- | | |
|--|-------------------|
| a. Cash incentives to encourage landowners to become involved | 1 2 3 4 5 |
| b. Small grants for restoring or maintaining natural areas | 1 2 3 4 5 |
| c. Property tax breaks for conservation of significant natural areas | 1 2 3 4 5 |
| d. Income tax breaks for conservation of significant natural areas | 1 2 3 4 5 |
| e. Large grants to cover land management costs | 1 2 3 4 5 |
| f. Cost sharing for management assistance | 1 2 3 4 5 |
| g. Conservation awards and public recognition to landowners who participate | 1 2 3 4 5 |
| h. Incentives (financial or non-financial) that fit the level of commitment involved | 1 2 3 4 5 |

How important is providing these particular programs and services:

a. A targeted landowner contact program to support landowners (people getting in touch with owners of important land, answering questions, providing information)	1	2	3	4
b. A variety of conservation options to meet different landowner needs/interests	1	2	3	4
c. A variety of organizations to meet different landowner needs/interests	1	2	3	4
d. Consultation with landowners in designing programs, options, and incentives	1	2	3	4
e. An easy and uncomplicated process for landowner involvement in conservation	1	2	3	4
f. Knowledgeable advisors in the organizations supporting landowners	1	2	3	4
g. Information presented in a format that allows landowners to learn about options and make decisions on their own	1	2	3	4
h. Coordination of the efforts of the various conservation organizations and agencies (goals, programs, information provided to landowners, contact with landowners etc.)	1	2	3	4
i. A variety of approaches to providing information including pamphlets, books, public education workshops, slide shows, personal interviews etc.	1	2	3	4
j. A strong commitment to private land conservation from conservation organizations and agencies (time, funding, staff)	1	2	3	4
k. Government grants to support the work of non-government organizations	1	2	3	4
l. Other support for private land conservation (legal, economic, social, policy)	1	2	3	4
m. Flexibility in the length of time involved in a conservation agreement	1	2	3	4
n. Innovative approaches to private land conservation which bring together government, non-government organizations, landowners and community groups	1	2	3	4
o. An effort to develop more open and effective communication with landowners	1	2	3	4
p. Revision of tax laws with implications for private land conservation	1	2	3	4
q. Training and education for personnel involved in conservation organizations and agencies	1	2	3	4

What else do you think could be done to improve private land conservation in Nova Scotia and ensure its success?

RECOMMENDATIONS FOR INSTITUTIONAL ARRANGEMENTS

Please circle the letters of answers that apply for each question. You may circle more than one answer.

Who should provide private land conservation programs (education, information and advice) for landowners?

- a. Federal government (e.g. Canadian Wildlife Service)
- b. Provincial government (e.g. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (e.g. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

Who should provide funding for private land conservation?

- a. Federal government (e.g. Canadian Wildlife Service)
- b. Provincial government (e.g. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (e.g. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

Who should be responsible for actual land management?

- a. Federal government (e.g. Canadian Wildlife Service)
- b. Provincial government (e.g. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (e.g. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

Who should be responsible for holding conservation agreements with landowners?

- a. Federal government (e.g. Canadian Wildlife Service)
- b. Provincial government (e.g. Department of Natural Resources)
- c. Local municipality
- d. Private organizations (e.g. Ducks Unlimited, Nature Trust, Nature Conservancy)
- e. Local community groups (conservation group, local land trust)
- f. Coalition (cooperative group of government, private, community groups)
- g. Private landowners themselves

PREFERENCES FOR CONSERVATION STRATEGIES

How do you feel about each of these strategies for nature conservation on private lands? Please circle the appropriate number beside the statement.

1=highly unfavourable
2=unfavourable
3=unsure
4=favourable
5=highly favourable

- | | |
|--|-------------------|
| 1. Landowner contact program (people contact landowners with land of conservation value, provide information, advice, deal with concerns etc.) | 1 2 3 4 5 |
| 2. Handshake conservation agreement (agree to protect the land for a set time period and give notice of threats to the area, and any changes in land use or ownership) | 1 2 3 4 5 |
| 3. Written conservation agreement (the same as a handshake agreement but the agreement is recorded and signed) | 1 2 3 4 5 |
| 4. Management agreement (a stronger agreement in which the landowner follows a specific management plan in exchange for management advice and assistance) | 1 2 3 4 5 |
| 5. Lease (land is leased to a conservation organization who then have a right to enter the land and manage it according to the agreed terms) | 1 2 3 4 5 |
| 6. Conservation easement (a long-term legal agreement which restricts certain activities on the land in exchange for lower property and income taxes) | 1 2 3 4 5 |
| 7. Sale of land or parts of land to a volunteer conservation group | 1 2 3 4 5 |
| 8. Sale of land or parts of land to government agency | 1 2 3 4 5 |
| 9. Donation (donate land or certain land rights to a conservation organization with resulting income and property tax benefits) | 1 2 3 4 5 |
| 10. Donation (donate land or certain land rights to a government agency with resulting income and property tax benefits) | 1 2 3 4 5 |
| 11. A formal agreement to give a conservation organization the option to buy land before any other buyer, for full market value, if the landowner decided to sell | 1 2 3 4 5 |
| 12. Donation in will (donate land or certain land rights to a conservation organization and receive lower estate taxes) | 1 2 3 4 5 |
| 13. Land use zoning and regulations for conservation (to control the use and development on private lands) | 1 2 3 4 5 |
| 14. Other _____ | 1 2 3 4 5 |

PERSONAL EXPERIENCE WITH PRIVATE LAND CONSERVATION

What is your involvement with private land conservation (Circle all relevant answers)

- a. Academic
- b. Professional (job-related)
- c. Non-governmental organization (executive)
- d. Non-governmental organization (non-executive)
- e. Personal experiences as a landowner
- f. Personal interest

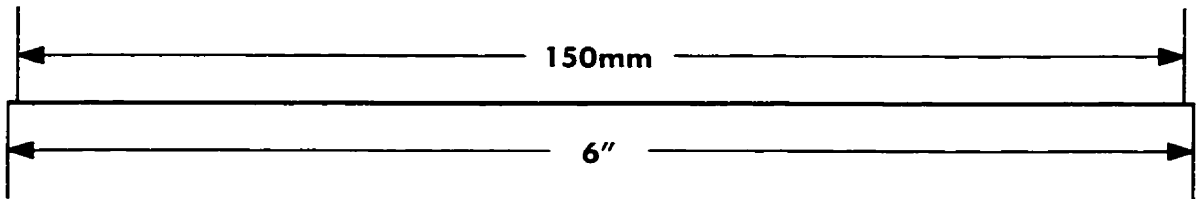
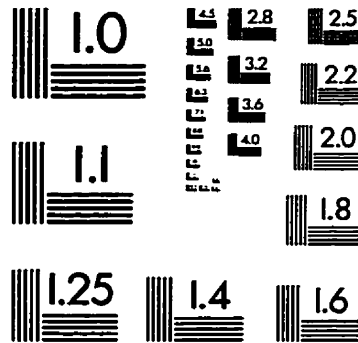
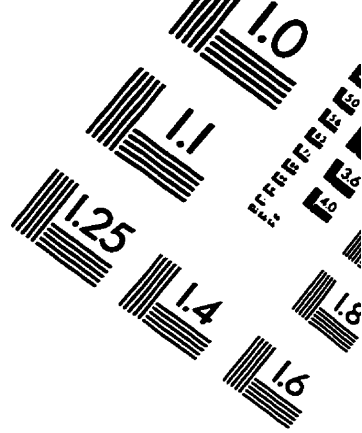
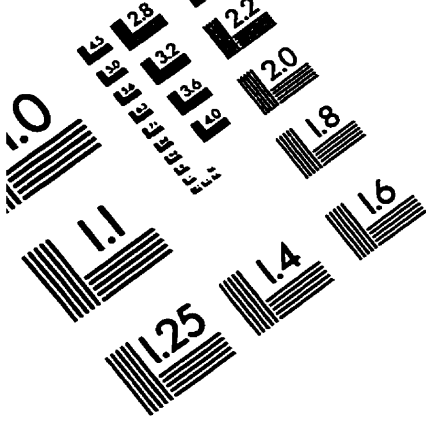
Please describe your experiences, positive or negative, with private land conservation

What do you consider to be the primary benefits of private land conservation?

Is there anything else you would like to tell me about conservation on private lands? Any comments you wish to make that you think may help in future efforts would be appreciated here or in a separate letter.

Please sign the consent card to allow me to use your answers in the survey. I will keep the consent card separate from your questionnaire, so your questionnaire will not have your name on it and your answers will be anonymous. If you would like a copy of the results please check the "yes" box on the consent card. Also, if you would like a follow-up interview to talk about any of these issues further, please check the appropriate box on the consent card.

Thank you for participating.



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