COMMUNITY ENVIRONMENTAL DEVELOPMENT:

MOVING THE TOWN OF ORANGEVILLE FROM A TO B

A Thesis

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ABSTRACT

The intent of this research on land stewardship is to formulate a community environmental development model (C.EN.D.) for the Credit Valley Conservation Authority (CVC). The information that the model is based on was derived from research in the Town of Orangeville. Four sources were used: a community survey; interviews from the local citizenry; transcripts from a 1994 CVC subwatershed openhouse; and informal discussions with environmental experts working in the local community. The results of the data yielded three themes supported by twenty-one attributes in total. The three themes that emerged were centred around: population characteristics; environmental behaviour and local knowledge; and motivations and perceptions. Each theme suggested a course of action that a successful stewardship program should have. The resulting C.EN.D. model had three components (social learning, social marketing and societal guidance) that worked together to evolve the community towards a state of ecological sustainability.

Key Words: Environment; Stewardship; Community Development, Credit River

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Chapter 1.0: Introduction

Garret Hardin's *The Tragedy of the Commons* was published 29 years ago and its legacy of common-property resource management has, by some, been accorded the status of scientific law (Feeny et al, 1990). The essential idea was that resources held in common, such as oceans, rivers, and parkland are subject to massive degradation due to exploitation by a growing population, each acting in their own best interest (Hardin, 1968). Hardin has been widely cited as having said that resource degradation was inevitable unless common property was converted to private property, or government regulation of uses and users was instituted (Feeny et al, 1990). He argues that if we do not act in one of these two ways, we "*acquiesce in the destruction of the commons*" (Hardin, 1968: 1245).

The conclusion of unavoidable tragedy is based upon Hardin's assumptions of; open access; lack of constraints on individual behaviour; conditions in which demand exceeds supply; and resource users who are incapable of altering the rules (Feeny et al, 1990). Actual common-property situations often do not conform to all for of these assumptions. To put it in terms of Hardin's example: After several years of declining yields, the herdsman are likely to get together to seek ways to (1) control access to the pasture, and (2) agree upon a set of rules of conduct that effectively limit exploitation (Feeny et al, 1990). In Hardin's original paper he alluded to the potential viability of common-property, with his phrase "mutual coercion, mutually agreed upon", although he appears to have its meaning pertain to state institutions under representative government (Feeny et al, 1990).

Aldo Leopold (1991) noted that if conservation is to become "real and important" it must "grow from the bottom up"(p.300). It must become fundamental to the day to day lives of millions of people, not just those few professional resource mangers trying to affect change. Taking the environment seriously means rethinking how our politics and civic life fit the places we inhabit. Rebuilding place-focused politics will require revitalizing the idea of citizenship rooted in local community. Democracy, as John Dewey (1954: 213) observed "must begin at home, and its home is the neighbourly community". We need an ecological concept of citizenship rooted in the understanding that activities that erode soils, waste resources, pollute, destroy biological diversity, and degrade the beauty and integrity of the landscape are forms of theft from the common wealth as surely as is bank robbery (Orr, 1994:169). An ecologically literate people engaged in and by its place, will discover ways to conserve resources. These principles lie at the heart of community based stewardship, and the question that this thesis deals with is the best way to implement these principles.

Hilts and Mitchell (1994:1) defined stewardship, in "Caring for Your Land - A Stewardship Handbook for Niagara Escarpment Landowners" the following way:

- **Caring** for the land and water in ways that benefit or sustain the watershed environment while enhancing the quality of the individual and the community.
- **Respect** and understanding of natural ecosystems and the interconnectedness of land, water, plants, animals, and humans.
- **Responsibility** as custodian to use and pass on the land and water undamaged or improved.
- **Resourcefulness** in undertaking management activities.
- **Sharing** knowledge with other community members.

Since stewardship is voluntary and cannot be imposed, the key to a successful program lies in motivating members of the community to act in the ways mentioned above, either individually or collectively depending upon the desired action. To date many of the stewardship actions undertaken in Ontario have been of an individual nature with there being only a few community based efforts (i.e. the Rouge River group, the Black Creek/Humber River initiative, Environmental Farm Plan).

This thesis uses data collected from four different sources to inductively develop themes that describe the behaviour and perceptions of the citizens of the Town of Orangeville. Analysis of these themes is then used to suggest measures that can be employed in order to get the public to recognize the relationship between its quality of life and the environment and to act more responsibly towards it. To lend support to the model suggested by the emerging themes, theoretical and practical sources were consulted so that a generalized community stewardship model could be proposed. The model attempts to build capacity in the whole community (in terms of awareness and ability to undertake responsibility for its environment) through employing the knowledge and resources of those people or groups of people that are already involved with the environment. It progresses through three stages, and strives towards the ultimate goal of ecological sustainability (Orr, 1994). The process of trying to reach ecological sustainability through building community capacity in this paper has been termed Community Environmental Development (C.EN.D.) by the author.

1.1 Problem Statement

There is an ever increasing pressure to urbanize an already heavily urbanized tributary at the head of the Credit River, Mill Creek (part of Subwatershed 19). Its flow contributes to both the Credit River and to the local groundwater supply. There is a very real fear by the Credit Valley Conservation Authority that there will continue to be further degradation of the stream channel. In order to counter the effects of urbanization the CVC wishes to institute a stewardship program. Unfortunately, they possess little information about the level of the local community's awareness of and attitudes towards the Creek. Further, there have been significant changes in the CVC's structure and funding that will effect the implementation of any stewardship program.

1.2 Goals:

The first goal of this thesis is to ascertain how the citizens of the Town of Orangeville perceive the environment in general and more specifically how they perceive Mill Creek. The second goal is to use this information to form a stewardship program aimed at community environmental development (C.EN.D.). This grounded theory model will then be supported by theoretical writings in the areas of social learning, social marketing, and societal guidance. The stewardship model will also address the changing structural environment within the Credit Valley Conservation Authority. Last, the stewardship initiatives called for in the Subwatershed 19 study will be used to illustrate how to implement the C.EN.D. model.

It is anticipated that the citizens of Orangeville will fall into one of four groups of people; those with a high level of environmental awareness who recognize the value of Mill Creek and those who do not value it; and those people with a low environmental awareness who do not value Mill Creek vs those that do. The value placed on Mill Creek is seen as being dependent on both the level of a person's environmental awareness (education), and being within close geographical proximity. See Table 1.1 below:

Major	People with High Environmental Awareness and value Mill Creek	People with Low Environmental Awareness / do not value Mill Creek
Minor	People with High Environmental Awareness/do not value Mill Creek	People with Low Environmental Awareness but value the Mill Creek

Table 3.1: Target Community Profile

Based upon the fact that the community is of a modest size (20,000) and that Mill Creek virtually bisects the Town there is an assumption that most people will fall into one of the two major categories. Since Mill Creek is such an integral part of the landscape and Orangeville is relatively small, it is safe to assume that the people in the two minor categories will be small. A separate survey for those households in close proximity to Mill Creek will be administered in order to determine how the community values it. See figure 1.2 for a model of the objectives and goals of the study followed by a brief description.

1.3 Objectives

Objective 1: To determine the behaviour and perceptions of the citizens of the Town of Orangeville towards the environment, both on their property and the immediate vicinity.

Objective 2: To gage the citizens of Orangeville's propensity to volunteer and what type of organization they prefer to join.

Objective 3: Based on the behaviour and perceptions uncovered in this case study to propose a generalized Community Environmental Development (C.EN.D.) model for an urban setting.

Objective 4: To subsequently find theoretical support for the C.EN.D. model.

Objective 5: To show how the C.EN.D. model can be applied to the Orangeville situation (Subwatershed No.19) and to make recommendations based on the information uncovered in objectives 1 and 2.

The following outlines each of the chapters in the thesis:

Chapter two lays the foundation for the research by exploring the literature that surrounds conservation, environmental protection, stewardship and public action. The theoretical bases for the C.EN.D. model is contained in the final three sections of this chapter.

Chapter three describes the methodology used to uncover the behaviour and perceptions of the citizens of the Town of Orangeville.

Chapter four analyses the data collected and cross references it with each of the four sources used. It concludes by summarizing everything into several general themes that emerge from the research. (Continued on page 8)

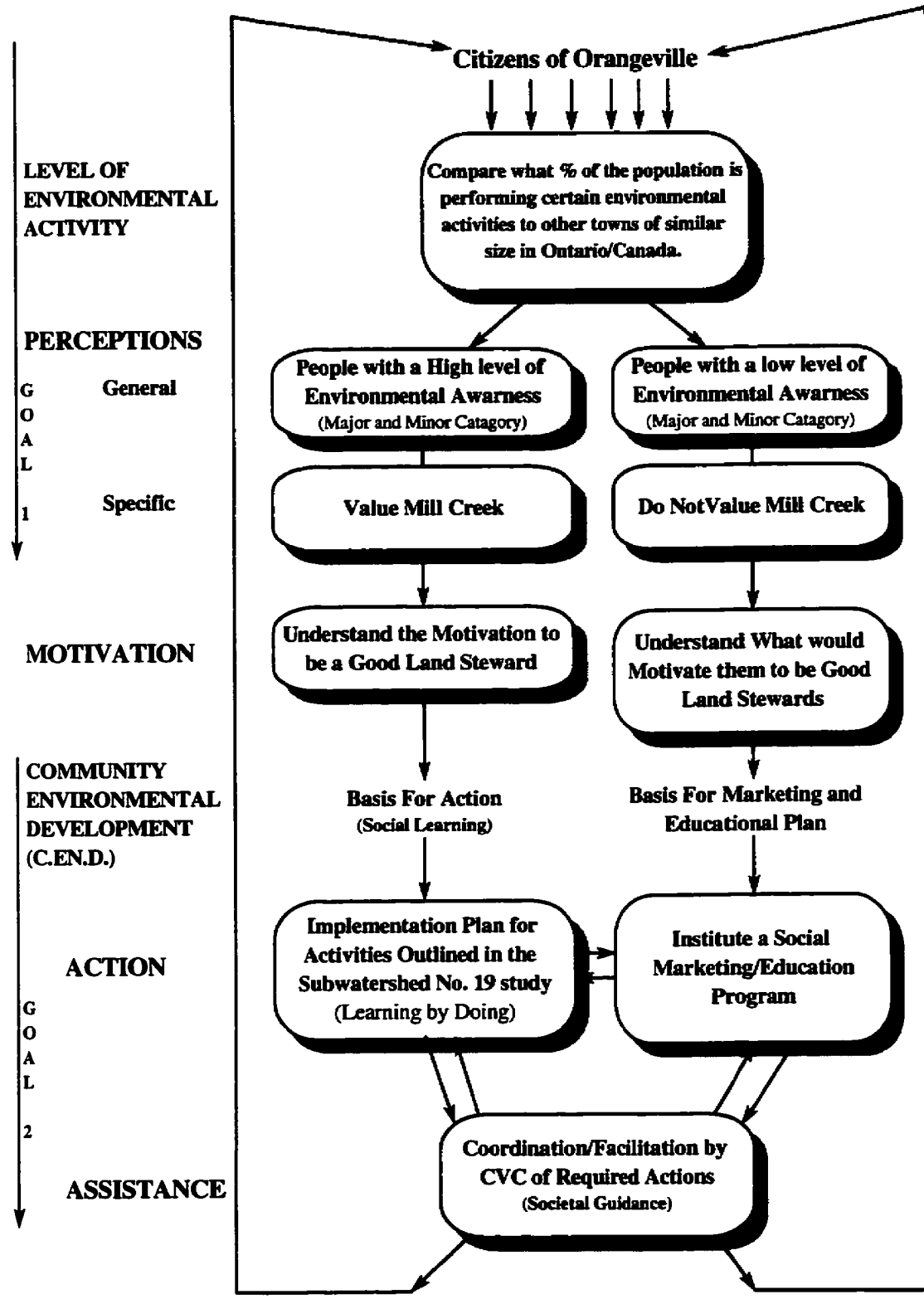


Figure 1.1 Study Process

Description of Study Process

Figure 1.1 is a flow diagram of the study process and shows how solutions to the goals and objectives will be saught. The left side of the chart deals with people that already have a high level of environmental awareness. The data collected on these people will reveal what their daily actions are and why they do them as well as why they value their local environment and specifically Mill Creek. This information will allow for a better understanding of the motivations behind what makes a person a good land steward. These motivations will form the basis for the type of stewardship programs the public would like to have and these programs can then be applied to the Subwatershed No. 19 requirements.

The right side of the chart is aimed at uncovering the deficiencies in knowledge exhibited by the public that need to be addressed by a stewardship program (i.e What is missing in their knowledge base that is preventing them from being good stewards?). The information collected will form the bases of a education and marketing program aimed at raising the publics' level of awareness so that they both understand and wish to participate in programs.

The three boxes located at the bottom of the diagram form the bases of the C.EN.D. model. Note how the arrows depicting the interrelationships between three components of the model and how this is an continuous cycle.

(Continued from page 6)

Chapter five discusses the emergent themes in terms of their meaning and how they relate to the theory presented in chapter two. The first section of the discussion concludes with the presentation of the C.EN.D. model as derived from the data and theory. The chapter then proceeds to explain how the model will work.

Chapter Six concludes with recommendations for the CVC and an academic overview of the research.

Chapter 2.0: Literature Review

The literature review is intended to serve three purposes. First, it will establish the context that the stewardship program will operate in, from both a general perspective (i.e. current conservation practices) to the more specific Subwatershed No. 19 best management practices (BPM's) requirements. Second, it will review past research on landowner attitudes and stewardship. Last, it will examine some of the literature on public action that supports each of the components (social learning, social marketing and societal guidance) of the inductively derived C.EN.D. model.

2.1 Conservation

2.1.1 The Need For Conservation

A common definition of a natural landscape is one that is unaffected by human activities or in which human effects, if present, are not significant to the landscape (i.e., do not interfere with the natural processes) (Byrnes, 1994). Using this definition, there are few remaining natural landscapes in southern Ontario. For example only approximately 17% of subwatershed No. 19 is forest covered, and 58% of the land is in low intensity agriculture (Credit Valley Conservation, 1997). Extensive and uncontained growth in the countryside has significantly reduced the overall percentage of natural landscapes.

Growth has resulted in both the loss of natural habitat and a change in the variety of habitat available to wildlife. Together these two processes have created a fragmented landscape of

small unconnected pockets (Byrnes, 1994). Since European settlement, approximately 50 plants and animals have vanished from Ontario. Another 215 animals and plant species have been reduced to populations of 5 or less. Less than 30% of original wetlands exist and prairies and oak savanaghs now survive on less than 0.1% of their original range in southern Ontario (Byrnes, 1994).

2.1.2 Landscape Ecology, Greenways and Buffers

Since the 1960's most landscape planning has been a form of "constraint-based exclusionary planning" (Ahern, 1995). In this defensive form of planning, resources are assessed and protected according to their intrinsic value (Ahern, 1995). While this planning approach has been successful in many respects, it has proven to be ineffective in preventing landscape fragmentation. In recent years, two theories from landscape ecology have been incorporated into discussions on planning sustainable landscapes: island biogeography and metapopulation dynamics.

MacArthur and Wilson's (1967) theories of island biogeography and metapopulations have been extended to terrestrial landscapes. Together these explain the decline and extinction of species resulting from fragmentation and isolation (Soule et al, 1991). The follow section explains the principles of island biogeography theory. An area intended for wildlife conservation should be large enough to maintain biological diversity, encompass a viable population of the largest local predator, or the seasonal territories and migration routes of the largest local herbivore (Soule et al, 1991). For example, an area less than 300 metres squared

will not support interior bird species such as white breasted nuthatches, black throated green warblers, broad winged hawks and barred owls (Byrnes, 1994). The establishment of large areas is not always possible and often an appropriate size for a conservation area can be estimated by noting what natural *landscape* features should be included to constitute a self-containing ecosystem.(e.g. wetland and the position of it's upstream water source). Where a compromise is unavoidable, various measures can be taken to minimize the adverse consequences of inadequate size.

Corridors can be established to permit passage between conservation areas of a similar nature. The advantages corridors provide are: higher immigration rates that will maintain species numbers; increased foraging areas; predation escape cover; and mix of habitats and environmental stages. Potential disadvantages include: the spread of disease, pests and exotic species; the decrease in genetic variation; and an increased susceptibility to natural catastrophes (Noss, 1987). Clearly, in order to minimize these adverse effects it would require a intensively managed system. Although intensively managed smaller reserves represent a second best solution, in the case of subwatershed 19 may represent the only feasible solution.

Fragmented habitats, connecting corridors (riparian and terrestrial) and landscape planning strategies and concepts, can be given the generic term 'Greenways'. For some the term also implies nature recreational trails. The design of a Greenway system aims to: (1) facilitate the movement of certain species within and between preferred habitats, (2) recognize species

movement over time, which enables genetic exchange, and may support metapopulations (assemblages of populations which interact in space and over time across landscapes), and (3) acknowledges that metapopulations enjoy greater survival prospects through the use of higher levels of physical and functional connectivity in fragmented landscapes (Ahern et al, 1995).

Lands adjacent to greenways can often be managed in ways that increase the effective range available to reserve inhabitants. These so called buffer zones are not a new idea but one that has not been utilized to it's fullest extent. Hart (1966) uses the French example of national parks in West Africa. Their design includes concentric rings with the core area being the most biologically important; the next ring is an area of controlled resource management and the outer ring consists of agriculture. Besides extending the usable area for reserve inhabitants there are three other functions that buffers preform. The first is concerned with the relaxation effect where the inclusion of a buffer will ease the competitive pressures associated with a sudden influx of animals to an available habitat (a reserve) due to the loss of their current home (i.e. Buffers serve to ease the impact of habitat change due to a population increase).

The second function pertains to ecotones. Boundaries between very different vegetation types have been known for their tendency to contain more species than the central part of the vegetation. The implementation of buffers could double or triple the number of different ecotone areas thereby enhancing species richness. Last, and probably most important,

buffers serve to shield the core area from the direct impact of negative human activity while also presenting opportunities for positive interaction between animals and people, as in the case of the French design. The establishment of buffers would appear to recognize the importance of the environmental, social and economic factors external to the conservation area that might impact on it's welfare.

2.1.3 Best Management Practices for Riparian Channels

The principles just discussed, those of landscape ecology, greenways and buffers have been recognized by Credit Valley Conservation through out the preparation of the Subwatershed No. 19 report. As a result, these principles underpin the recommended best management practices outlined in the Subwatershed No. 19 Technical Document. Without this knowledge, the casual observer might at times see the BMP's as a series of unrelated actions.

The Technical Document for Subwatershed 19 (CVC 1997), analyses the catchment area from a number of perspectives. The issues covered in the document include:

- the water budget (i.e., groundwater, baseflow, and peakflow);
- terrestrial and aquatic habitat;
- woodlands, including woodlots and forests;
- wetlands;
- stream morphology;
- Environmentally Sensitive Areas/ Areas of Natural and Scientific Interest (ANSI);
- aesthetics; and
- recreation

Once the data was collected and the analysis performed in the Technical Document, several proposed plans aimed at the conservation and restoration of the area were prepared. These plans were ecosystem based, that is they recognized the potential interaction between each of the above natural environmental resources together with human considerations.

In order to achieve the plan's goals and objectives, a set of Best Management Practices (BMP) were put forth, that if implemented will either protect, enhance or restore the environment. There are four general categories which most BMP's will fall into; (1) environmental protection or preservation; (2) environmental control; (3) regulatory control; and (4) habitat protection, restoration or enhancement.

1) **Environmental protection or prevention** is an umbrella term for a wide range of pollution reduction activities which are carried out at the source. These may include:

- public education - e.g., educate urban consumers on household hazardous wastes and lawn management practices; educate farmers on conservation land management;
- source controls - e.g., sewer use bylaw enforcement, spill prevention and management at source controls of urban runoff;
- inspection - e.g., regulatory inspection or erosion/sedimentation control devices; and
- alternative substance/material usage - e.g., replacing or substituting non-hazardous for hazardous materials in processes.

2) **Environmental control** generally involves the implementation of technical solutions to reduce/minimize/eliminate the impact of a given contaminant. Prime examples include the upgrading of a water pollution control plant to treat combined sewer overflows or the installation of a storage facility to reduce water quality contaminants associated with stormwater runoff.

3) **Regulatory control** may be applied in one of many ways. For example, the Ministry of the Environment has various programs (e.g., Municipal Industrial Strategy for Abatement of Pollution (MISA) which set standards for the discharge of pollutants from various municipal and industrial plants. Regulatory control may also be used to protect environmental features (e.g. through the wetlands Policy or Fisheries Act). Last, regulatory control may be applied in conjunction with environmental control alternatives. This approach is used in the Region of Ottawa-Carlton where proposed stormwater management facilities which discharge flows to the Rideau River must have effluent levels of faecal coliform less than 100 E. Coli./100 ml.

4) **The protection, restoration or enhancement** of habitat is generally used to improve conditions for aquatic species, waterfowl or wildlife. Improving habitat also has ancillary benefits with respect to baseflow and groundwater resources. Also, habitat enhancement may have multiple benefits in situations where the stability of streams are improved.

Several of the BMPs, such as public education or source control, should be implemented in all cases, while others such as infiltration facilities are site specific. Further, several BMPs are relatively straightforward in that their impacts are quantifiable, while for others this may not be so ease because the benefit of the BMP has not yet been quantified (e.g., buffer strips). In the latter case implementation becomes a matter of judgement. The following is a list of Best Management Practices suggested for subwatershed 19:

1) Water Quality/ Quality Facilities
2) Infiltration Facilities
3) Site Planning
4) Aquatic Habitat Restoration
5) Terrestrial Habitat Restoration
6) Wetland Creation
7) Source Control
8) Public Education
9) Reforestation
10) Sediment/Erosion Control
11) Natural Channel Design
12) Urban Retrofitting
13) Buffer Zones
14) Groundwater/Baseflow Protection

Note the broad categories of each of the BMPs. Each BMP requires several tasks, some relatively simple, others more difficult, to be performed in order to achieve the targets associated with ecological restoration. The difficulty levels are a function of available resources (both monetary and human), required technical expertise, and the degree of community organization and commitment. Each BMP has a page of 'implementation considerations attached to them (Technical Document 1997: section 8.16). For the most part, these considerations have been written from a top down rather than a community based approach to environmental sustainability. (The previous section is based in part on the CVC, Subwatershed Technical Document. See Appendix A for definitions of each of the above BMPS.)

2.2 Current Planning, Landowner Attitudes and Stewardship

This section of the literature reviews the current planning legislation as it pertains to conservation, landowner attitudes and the present trends in stewardship in Ontario. Where the last sections of the literature review put into context stewardship from the perspective of biological function and its restoration, this section deals with the human factors that a stewardship program will have to operate in.

2.2.1 Current Planning and Conservation Efforts in Ontario

".... the existing regulatory top-down approach to the management of rivers adjacent to private lands has failed." (Doppelt et al, 1993)

The last five years have been turbulent ones in terms of planning reform in Ontario. Beginning with the efforts by the *Commission on Planning and Development Reform in Ontario* in 1992 to address the effectiveness and efficiency of the land use planning process, to the current restructuring of the size and number of municipalities in Ontario, it has been a time of constant change. The result of the *Commission's* work was to a Comprehensive Set of Policy Statements (CSPS)(which has since been consolidated and revised), intended to *"protect the environment, streamline the planning process and give municipalities significantly more power over local development decisions."*(Ministry of Municipal Affairs, 1995, 1). The reformed planning process is policy driven (Bymes, 1994) with the province's role being to establish policies that guide municipal planning. The province will depend upon local Official Plans to implement provincial policy. Responsibility for the development approvals will ultimately be transferred to most municipal governments, and regional/county

governments will approve the Official Plans of lower tier municipalities (Byrnes, 1994). A package of "open government" reforms were to make local elected officials more publicly accountable, but for the most part, this last part has since been rescinded (comparison of the Planning Act, MMA 1994 v. 1996) .

Reform of Ontario's planning system attempts to recognize the importance of natural and cultural heritage preservation. The larger objective of these reforms is to create an ecosystem planning process that meets the needs of the community, the economy and the environment (Byrnes, 1994). The integrated network of conservation lands and waterways called Greenways in the previous section (Landscape Ecology) has been given the name "natural heritage systems" in the context of Ontario planning policy. Consent for the implementation of a natural heritage system is usually sought through the land use planning process. It is based on municipal and regional Official Plans that are required to incorporate the province's interests (Vanderschot, 1997).

Official Plans (OPs) rarely have clear applicable environmental protection policies and the extent to which a municipality incorporates environmental objectives (based on the Comprehensive Set of Policy Statements, MMA, 1996) has a direct effect on conservation (Byrnes, 1994). The *Planning Act* (MMA, 1996:3) does not mandate that municipalities incorporate the policy statements into their OP; they simply *"must have regard for"* them. The Comprehensive Set of Policy Statements (CSPS) includes the following six sections:

1) Natural Heritage, Environmental Protection and Hazard Policies;
2) Economic, Community Development, and Infrastructure Policies;
3) Housing Policies;
4) Agricultural Land Policies;
5) Conservation Policies; and
6) Mineral Aggregate, Mineral and Petroleum Resources Policy.

Despite explicit statements such as "natural heritage features and areas will be protected from incompatible development" (MMA, 1996, 7) in the CSPS, the weak wording in the *Planning Act* has led to inconsistencies in the application of policy. For example, designation of Areas of Natural and Scientific Interest (ANSIs) and Environmentally Sensitive Areas (ESAs), recognized by the Province or some other appropriate authority, does not ensure that an area will be protected. The designated area must be recognized in the local OP with all the corresponding zoning in place, to affect protection. Conversely, the policy governing development on or around a provincially significant wetland (Classes 1 -3) states that it is not permitted within 120 metres of its boundaries, and must have an environmental impact statement showing that "no net negative impacts" to the wetland will occur as a result of development (MNR and MMA, 1996:14). Despite these and other regulatory attempts at conservation, development persists even though it is still subject to an

Environmental Impact Study in an attempt to mitigate damage. For example, a recently constructed regional road bisects a Class 1 and 2 wetland in Kitchener, Ontario and the buffer distance from a stream or river that new subdivisions can be located is often negotiable.

Recent amendments to the *Municipal Act* enable municipalities to control site alterations such as grading and dumping of fill. They also allow municipalities with over 10,000 residents to control tree cutting. These changes will help protect certain physical and natural areas (Byrnes, 1994).

Much of the provincial policy described above will be implemented through local and regional Official Plans. However, municipalities can go beyond these provincial requirements to address the protection and regeneration of natural features in a variety of ways. Local planning instruments, including Official Plans, zoning by-laws, secondary plans, subdivision agreements, site plan control and other forms of development control, may for example:

- identify and protect woodlots, valley corridors, and natural areas of significance at the local level;
- set a target of no net loss of natural areas within each municipality, with requirements for replacement or mitigation where any natural area is affected by development;
- incorporate natural heritage features into comprehensive natural heritage systems within and between municipalities;

- identify ecological restoration areas to be included in development plans, park management plans, or public works construction projects; and

- encourage the development of integrated management plans and watershed plans, including provisions for natural heritage protection and enhancement.

(Waterfront Regeneration Trust. 1995:27)

2.2.2 Landowner Attitudes

Research has demonstrated time and again that landowner attitudes reflect western society's land ethic. A set of principles, beliefs, values and facts that govern society's relationship to the land can collectively be called an 'ethic'(Rees, 1995). When people talk about land and its future use, the conversation quickly turns to location and price. Basically, it is considered a commodity. While it is easy to measure the economic value of natural resources, many people remain unaware of the unpriced ecological functions and life support services provided by nature (Rees, 1995:8). Even further removed from most people's minds are the aesthetic and spiritual values associated with natural landscapes.

Much has been written on the attitudes of landowners towards the conservation of natural areas on their property within the western world. Although this is a complex area of human behavioural study and there are variations throughout different sectors of the economy and different regions of the country, the following statements generally characterize society's attitudes:

1) Several studies have indicated that landowners prefer education, technical advice and tax breaks over regulatory approaches, even though the latter may be recognized as being more effective (Duff et al, 1991; Argow 1996; Sample 1994; Brunson et al, 1996)

2) Open discussion with landowners over proposed regulations helps to create statutes that are more effective in their intent. The regulations should also be applied uniformly (Salazar 1985).

3) When the possibility of remuneration to the landowner for the provision of conservation or access to private lands is introduced, owner's attitudes become more favourable (Bishop and Phillips 1993).

4) People like to be viewed as being progressive which in turn effects their decision making progress so that this can occur. This could therefore effect the activities on their land in both a positive or negative manner depending upon the progressive changes made (Naussauser and Westmacott 1987).

5) Amenity considerations such as wildlife, scenery, and recreation are slowly gaining equal status with the economic considerations that a parcel of land could yield for their owners e.g. harvesting of timber (Brunson et al, 1996; Birch 1989; MacConnel and Archey 1982).

6) The willingness to participate in ecosystem management may be influenced by concerns about property rights. This most often is related to recreational activities, trespassing and hunting (Brunson et al, 1996).

7) The personal cost of maintaining a public benefit on private land is a concern. Without due compensation (e.g. tax rebates) there may be resistance to participating in greenway initiatives (Bourland and Stroup, 1996).

8) Rural people may resent an imposed preservation ethic of a predominantly urban environmental group (Mather, 1993).

Landowner attitudes are the foundation upon which stewardship is based. The success or failure of specific programs is usually the direct result of failing to recognize one or more of the above tenets.

2.2.3 Stewardship

Hilts and Mitchell (1994:1) define stewardship as caring for the land in ways that benefit or sustain the land while enhancing the quality of life of the landowner, family, friends and neighbours. Stewardship implies:

- Respect for natural ecosystems and interconnectedness of land, water, plants, animals, and humans;
- Responsibility as "custodian" to pass the land on undamaged or improved;
- Resourcefulness in assessing options and undertaking land stewardship activities.

A number of specific stewardship tools and approaches have been identified that can be useful for protecting the natural environment both within and outside the planning process. These vary in their objectives and the degree of difficulty of their implementation. Programs in Ontario tend to be focused in one of three directions:

1) they are concerned with the education of the individual landowners and sometimes extend to verbal agreements;

2) they work with or through existing organizations (national, provincial or otherwise) that have specialized interests in the conservation of a particular resource (e.g. Ducks Unlimited); or

3) they are community based programs targeted at specific sectors of the environment. Examples of these include OMAFRA's Environmental Farm Plan and groups like Friends of the Black Creek.

William Rees with his notion of an "Ecological Footprint" suggests that the environment is being transformed at an astounding rate and there is a "gathering sense of urgency"(1994:7). The total land (in terms of land/water area) "consumed" by a defined economy or population is the ecological footprint of that economy on the earth (Rees, 1994). For example, the

Vancouver-Lower Fraser Valley region appropriates from nature the ecological production of the land area at least 22 times larger than the Lower Fraser Valley itself (Rees, 1994) This begs the question: 'If humans are consuming resources in the order of several magnitudes more than their immediate living area, and you grant that there is a general failure of the top down regulatory approach to land use planning from an environmental perspective, then should we not broaden the focus of stewardship from one of individual landowner contact and specific target programs to one that is more encompassing in its intent?' (Orr, 1994; Waterfront Regeneration Trust, 1995; Rees, 1994; LandCare, 1995;American Rivers, 1997).

The shortcomings of most Ontario stewardship initiatives are that they are too narrow in focus, both in the number of people they target and their objectives; they are not transforming either the landscape or human attitudes quickly enough; and they tend to work in isolation of their surrounding community and from other projects (despite efforts to overcome this). Donald Gordon of the Muskoka Heritage Foundation put it like this:

> *"Voluntary private land stewardship works because a great many landowners are ready and willing to 'do the right thing' if given sufficient support and encouragement.. Education is a far more powerful tool than legislation in the struggle to protect our heritage. Critical to the success of stewardship as a conservation strategy is the ability to sustain the program indefinitely. While agency programs can be very effective at recruiting stewards, only programs firmly anchored in the community will endure over the long term.... Funds from government and from national organizations may be available to start a program, but they will not be able to sustain it. The most serious oversight in the experience of the Muskoka Heritage Foundation was not to organize itself around fundraising and membership."*
>
> (Donald Gordon 1994, 32)

In light of these comments, the answer to the above question is to make Ontario stewardship programs more community based.

In a community based stewardship program, opportunities for discourse allow participants to formulate policy. Policy participants are placed in the position of the 'other' in such a way that they are able to 'acknowledge ... and legitimate ... other social world's (Caldwell, 1997; Hoover and Shannon, 1995). Under these conditions, there can be a deeply shared understanding of the other's socio-political position and participants are more likely to grasp fully all the dimensions of the policy issues (i.e. how best to institute a BMP). Policies emerge from learning processes that take place between multiple organizations and citizens, and this process yields complex knowledge built from simpler knowledge concepts and experiences (Hoover and Shannon, 1995). Support of the policy is strengthened further if all the interested groups gain a stake in the policy process through open and full participation. The Australian LandCare system is a good working example of a successful community based stewardship program. The major functional mechanisms of a community based program have been outlined in appendix C (reviewed for the Huron County Stewardship Council), and are based primarily on the LandCare model.

Beyond the policy formulation previously mentioned there are numerous benefits to be derived from the partnerships formed in a community based stewardship model. Some of them are:

1) Partnerships expand the resource base available to the program and therefore the community's development, by pooling resources (especially important in this time of governmental fiscal restraint).

2) Partnerships expand the range and depth of actions that can be undertaken in achieving stewardship objectives.

3) Community initiatives provide a major way in which a greater range of interests can be brought into the stewardship process and by which people and groups in different segments of the community can be encouraged to take on more responsibility for their own development.

4) A community based system holds the potential to create strength through the recognition of diversity and the complimentary roles that different people and players can perform.

5) Through team work there is the opportunity for some partners to contribute significantly to developing the capacity of other partners so that they can become more fully involved (mutual learning).

6) Community based programs create the possibility of a societal paradigm shift to a more environmentally sustainable way of life through the re-establishment of our connection to nature.

(Adapted from Sustainable Community Analysis Workbook 1, by Christopher Bryant 1994)

Clearly, if one views the above benefits in light of the current government restructuring then the only conclusion that can be reached is that, if ecological sustainability is to be achieved, then we must develop more community based programs. And the first step, as suggested by Rees (1995, 8), is to reduce the distance that has developed, both *"psychologically and spatially, from the land that sustains us"*.

2.3 Theoretical Tenets of a Community Based Stewardship Model

The next four sections of the literature review provide the theoretical background that underpin the Community Environmental Development Model presented in chapter 5.

2.3.1 Introduction

David Orr, an environmental educator, criticizes the term sustainable development and instead proposes the term "ecological sustainability" (Orr 1992:25-27). Orr describes ecological sustainability as having six major characteristics:

- The important role of citizens in creating the future;
- the rooting of ecological sustainability is in the folkways of the past as much as in new knowledge;
- nature should be viewed as a model for designing places and economies not just as a set of constraints;
- nature as a model for societal systems which influences our decisions about scale and centralization;
- ecological sustainability as a *paradigm* based on the concept of interrelatedness as a system of knowledge.
- the fallibility of humans, which limits our ability to coordinate or comprehend things beyond a certain scale;

Orr's definition grapples with society's notion of systems, their linkages, processes, patterns and content (Orr, 1992). His definition, in its entirety, points to education being our salvation if ecological sustainability is to be achieved.

2.3.2 Social Learning

For some, social learning serves as a metaphor to denote a certain style of linking knowledge to action; for others, it is a social technology, much like policy analysis. Yet, it stands in the sharpest possible contrast to the latter (Friedmann, 1987). Policy analysis is focused on decisions; it is a form of anticipatory decision making, a cognitive process that uses technical reasons to explore and evaluate possible courses of action (Friedmann, 1987). Social learning, on the other hand, begins and ends with action, that is with purposeful activity (Friedmann, 1987). It is the theory of "learning by doing" (Dewey, 1938); practice and learning are construed as correlative processes, so that one process necessarily implies the other (Friedmann, 1987).

Friedmann (1987) asks the question "What are the principle modes of learning?"; for which he provided three answers. First, learning manifests itself as a change in practical activity. Directly woven into social practice, it is rarely systematized or articulated in the formal language of scientific discourse. Social learning is typically a form of tacit and informal learning (Polanyi, 1966).

Secondly, social learning may involve so-called change agents who encourage, guide, and assist in the process of changing reality. They are generally professionals or para-professionals (trainers, facilitators, process consultants, organizers) who bring certain kinds of formal knowledge to the ongoing social practice of their "client group" (Friedmann,

1987). To be effective, change agents must develop a transactive relationship with their client conducive to mutual learning (Friedmann et al, 1987).

Finally, one may speak of either *single* or *double-loop* learning (Argyris et al, 1982). The former involves a simple change in the tactics or strategy of the action to solve a given problem; the latter requires an adjustment of the norms governing the action process and, specifically a change in the actor's theory of reality, values and beliefs (Friedmann, 1987). In other words, structural versus functional knowledge. It requires the adoption of daily activities that will have far-reaching practical consequences for self-image, human relations, formal authority, and ultimate distribution of the cost and benefits of action (Friedmann, 1987).

In social learning, knowledge of reality and of practice, exert a mutual influence on each other. Theory however, is based not only on an actor's evolving influence, but on prior learning as well, reflecting the actor's class position, work experience, and formal education. Prior learning is far from being a chaotic jumble of beliefs, ideas and memories. Supported by one's peer or reference groups, theories about the world acquire a definite structure and are difficult to change. Such change has been compared to a process of re-education that involves not only cognitive but also *affective-behavioural reconstruction* i.e double -loop learning (Friedmann, 1987).

These somewhat tentative generalizations concerning the conceptual scheme of social learning may now be drawn together into a more systematic set of statements.

1) Actions in the public domain usually involve many collaborators acting through small, task-oriented groups which, in their internal relationships, display psychosocial dynamics that are not reducible to the characteristics of individual participants. Continuously forming and reforming, action groups are temporary social systems.

2) Embodied in group relationships, social learning is a cumulative process that lasts for the duration of a given action cycle. When a cycle terminates and the group dissolves or undergoes a major change in composition, what has been learned is dissipated and lost, if measures are not taken to prevent this. Action groups are a form of collective memory.

3) Action groups are organized around specific tasks. In addition to the objective requirements of the tasks, group behaviour is influenced by the way personal needs of its members for love, esteem, and self-expression are being addressed within both the group and the larger environment of which it forms a part.

4) Social learning in small groups takes place through face-to-face relations, or dialogue. But dialogue requires interpersonal skills, such as the art of listening, the ability to trust others and make oneself vulnerable to them, a willingness to suspend rank and material power, and a responsiveness to other's needs. These and related skills of dialogue can be acquired, at least in rudimentary form through appropriate training.

5) In social learning, objectives tend to emerge in the course of an ongoing action. To bring about a significant redirection of objectives, however, may involve a long and painful process of "double-loop" learning.

(Friedmann, 1987)

John Dewey had a profound influence on relating the theory of social learning to democratic principles. Dewey had a noble and optimistic vision of the future and an ardent belief in the possibilities of human self-realization through social learning (Friedmann, 1987). The question that plagued him was how to get there? He thought that to reach the Great Community one had to start at home. The journey had to begin in the community of neighbours. He stated: "Democracy must begin at home, and its home is the neighbourly community" and " The local is the ultimate universal ... and as near an absolute as exists." (Dewey, 1946, 213). His writing in turn influenced Lewis Mumford, as well as others.

Both Dewey and Mumford believed that social learning had to be pushed down to the neighbourhood and village (Friedmann, 1987). Yet, where Dewy trusted in experts, Mumford thought that people could do a lot for themselves.

> *"The real alternative to the empty political patterns of the nineteenth century lies, not in the totalitarianism, but in just the opposite of this: the restoration of the human scale in government, the multiplication of the units of autonomous service, the widening of the cooperative processes of government, the general reduction of the area of arbitrary compulsion, the restoration of the processes of persuasion and rational agreement. Political life, instead of being the monopoly of remote specialists, must become as constant a process in daily living as the house-wife's visit to the grocer or the butcher, and more frequent than the man's visit to the barber."*
>
> (Mumford, 1938: 382)

It is the concrete, everyday experiences of people in their local and regional surroundings that form the basis of all reliable knowledge for guiding their actions (Friedmann, 1987).

We glimpse here a vision of a learning society in which people are politically active and informed and can engage each other in a rational discourse over the kind of regional life they would want for themselves. Mumford thought that to realize this vision people would need to undergo a special educational experience. Beginning with children, as they became active in various kinds of regional activities, this would culminate in their participation in regional surveys, which is where planning starts (Friedmann, 1987).

There are two problems with social learning as presented in this purely cognitive form: its rationalistic bias and the validation of knowledge (Friedmann, 1987). Dewey postulates a learning process that functions not unlike a perpetual motion machine: once it is set in motion it never stops, because its motion generates no friction (Friedmann, 1987). In the real world friction is always present and requires an equivalent amount of energy to overcome this resistance and to perpetuate the action. The philosophers of social learning also have constructed a learning model based upon the world of science: error is always recognized and is quickly mended. Individuals outside of the scientific world are not as a rule, eager to acknowledge error; they have too much at stake, money and reputation being the most

obvious. Further, it is not always clear when an error has been committed or what is the nature of that error (Friedmann, 1987). If a social learning model is to succeed it must have mechanisms available to overcome these two major problems.

2.3.3 Social Marketing - How to over come Friction

Social Marketing has been defined as:

"The design, implementation and control of programs calculated to influence the acceptability of social ideas, and involving considerations of product planning, pricing, communications, distribution, and marketing research."

(Kolter and Zaltman, 1971: 5)

Contrasted with marketing in the pure economic sense, which is equivalent to the notion of consumer sovereignty, social marketing is a concept that applies marketing knowledge to the marketing of social causes (i.e. marketing for quality of life). It has been argued that neoclassical economic theory does not directly apply to social ideas because (1) social marketing does not ascertain consumer needs and wants, (2) the social marketer is motivated by other factors besides profit-maximization, (3) there is no price mechanism involved with social ideas or causes, (4) generally there is insufficient competition among divergent social claims, and (5) social marketing is a vehicle of social rather than market controls (Sirgy, Morris and Samli, 1985). The limitation of the 'rational-economic model' is that it overlooks " the human dimension ... the rich mixture of cultural practices, social interactions, and human feelings that influence the behaviour of individuals, social groups, and institutions"(National Research Council in Stern and Aronson, 1984, 2).

Prior to introducing a more sophisticated model of social marketing, it is useful to distinguish between three classes of resource-use behaviour; (1) investment, (2) management and (3) curtailment (Kempton et al, 1984). Investment refers to purchasing more resource-efficient equipment (e.g. stove, furnace, toilet). Management pertains to being more resource-efficient through making changes in behaviour (e.g. setting back the thermostat each night). Finally, curtailment involves reducing amenities or comfort (e.g. cycling to work rather than driving).

These three classes of behaviour differ both in their impacts on resource consumption as well as the ease with which they can be altered. Investment requires a once only change in behaviour, while management and curtailment require both initially changing the behaviour and then maintaining that change over time (Kempton, 1992). Investment and management can be thought of as enhancing efficiency - the householder is using fewer resources to obtain the same level of comfort. Curtailment, in contrast, involves giving up comfort or amenities in order to conserve resources. In general, it is difficult to alter management or curtailment behaviour just through social marketing techniques (that will be discussed later), mostly because it is difficult to maintain such behavioural change in a society that is structured around individualistically high resource use (Kempton, 1992). Behavioural based social marketing strives to change behaviour in the difficult categories of management and curtailment through employing social psychological knowledge.

The real world application of behavioural change strategies in the domain of environmental protection has been minimal, except for the implementation of policies that restrict the behaviour of home owners, corporations and community groups (Geller, 1989). The model presented in figure 2.1 integrates concepts from both social marketing and applied behaviour in an attempt to provide insight and direction for environmental protection and preservation.

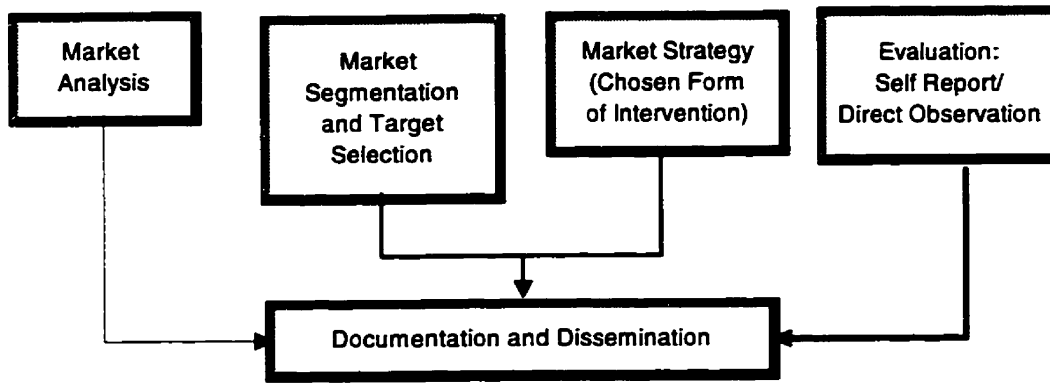


Figure 2.1: The basic components of a behavioural based social marketing model. The differential thickness of flow lines illustrates increasing importance of the components during later stages of the model.

Source: adapted from Geller 1989

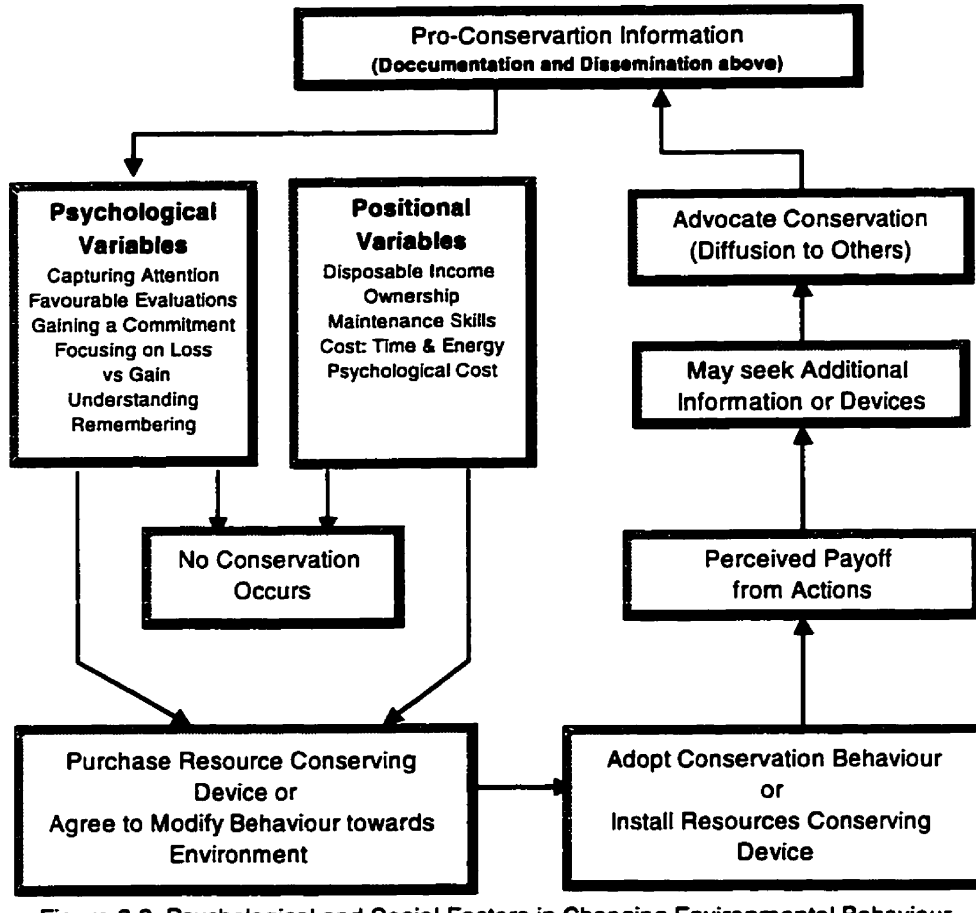


Figure 2.2: Psychological and Social Factors in Changing Environmental Behaviour

Source: adapted from McKenzie-Mohr 1994

The first box comes from traditional economic marketing practices. An analysis is conducted to establish the market boundaries and obtain information about wants, needs, perceptions, attitudes, habits, and satisfaction levels of the potential market (i.e. target population). The important characteristics of the targeted individuals or groups are derived from both primary data collection (gathered from questionnaires, focus groups and interviews) and secondary data (obtained from archival investigation). This step is crucial for any marketing effort and provides the foundation upon which market segmentation and marketing strategies are constructed (Geller, 1989).

Market segmentation is the partitioning of a potential market into homogeneous submarkets based on common characteristics which are identified through the market analysis. This provides a basis for selecting target markets and developing optimal promotional programs for individual target segments (Geller, 1989). Two problems make this particularly challenging. One, many social agencies resist the idea of segmentation because their egalitarian philosophy prohibits treating certain groups differently or treating some groups while ignoring others. Second, self-reporting information is rarely adequate for objective identification of market segments (Bloom & Novelli, 1981).

After analysing the market and determining target segments, social marketers develop a specific market intervention to achieve desired outcomes (Geller, 1989). This is where the model diverges from traditional economic marketing. One of the models that behavioural analysts use when creating intervention programs is the antecedent-behaviour-consequence (ABC) model, a conceptualization that has been referred to as "behavioural engineering"(Ulrick & Halkins et al, 1969). Behavioural engineering focuses on environmental arrangements (i.e , behavioural antecedents and consequences)

in order to affect behaviour changes (i.e., increase the occurrence of desired behaviours and decrease the occurrence of undesired behaviours) (Geller, 1989). As can be seen in Figure 2.2, the psychological variables include: capturing attention, evaluating favourably, focusing on loss v. gain, gaining commitment, and understanding and remembering the communicator's message.

In order to be effective, all social marketing messages must initially obtain the attention of the recipient. While this point is obvious, it is frequently overlooked. In a review of the material prepared by governmental agencies and utilities on energy conservation, it was found that the majority violated this most basic principle (McKenzie-Mohr, 1994). Most of the brochures and inserts studied would not capture the attention of the intended recipient for a variety of reasons. There are several antecedent intervention techniques aimed at overcoming this problem. These include: awareness and education, verbal and written messages, modelling and demonstrations, and engineering and design strategies (Geller, 1998).

It is important to offer potential participants a sound rationale for the behaviour-change program. Research has shown that education directed toward behaviour change is more effective in small (i.e. 10 - 15 people) rather than large groups, and that it should include interactive demonstrations and discussions rather than lecturing or showing films to a passive audience (Geller & Hahn, 1984). Change agents should observe this well known educational principle: **Tell them and they'll forget - demonstrate it and they'll remember - involve them and they'll understand.** Education/awareness sessions and informational packages that did not promote participatory

involvement were not successful in motivating newspaper recycling, nor residential energy or water conservation (Geller et al, 1989: 21).

Geller, et al (1982) have identified four characteristics of antecedent messages that enhance the impact of verbal and written communications: (1) the desirable or undesirable behaviour is specified in precise terms, (2) convenient alternative desirable behaviours are indicated when avoidance of an undesirable behaviour is targeted, (3) the message is delivered as close as possible to areas where it is most opportunistic to affect target behaviour (e.g., as in point of purchase advertising), and (4) the message is stated in polite language that does not threaten an individual's "perceived freedom". For example, Winett (1978) and Delprata (1977) successfully influenced occupants of public buildings to turn off lights in a room by placing at light switches messages that requested the lights be turned off when the room was unoccupied.

Modelling refers to the demonstration of specific behaviours for the target individuals (Bandura, 1977). One method of demonstrating modelling can be accomplished through film, TV, or videotape. Environmental preservation efforts have essentially ignored modelling strategies, yet modelling has the potential of influencing thousands of viewers (Geller et al, 1989). Winett (1982,1985) found significant increases in conservation of electricity for home heating and cooling after showing residents TV or video presentations that demonstrated simple and convenient conservation behaviours by residents in situations similar to those of the viewer. The presentation also specified financial benefits (or consequences) that resulted from conservation behaviours.

Engineering and design antecedents for environmental protection involve the design or redesign of devices, machinery, or environments to facilitate the occurrence of environmental protection by increasing behavioural convenience (Geller, 1989). One of the best example of this the Disney Corporation study that concluded that the optimal distance between trash cans with in its theme park was 15 ft. They discovered that if the receptacles were any further apart, then the additional distance resulted in an increase in litter (Peters and Waterman, 1982).

In addition to presenting information vividly, Pacific Gas and Electric trained its energy assessors to frame information in terms of loss rather than gain. The bases for this is founded in research that demonstrated that individuals are more concerned with losing rather than gaining an equivalent amount of money and are more likely to act to avoid a loss than they are to secure a gain (Gonzales et al, 1988). It would therefore, be expected that it is more effective when a presentation focuses on a *loss* via inaction, rather than a gain/savings via action (McKenzie-Mohr, 1994).

The previous methods of communications are aimed at obtaining a favourable evaluation of the proposed behavioural changes by the target group or individual. The perceived knowledge and credibility (appropriate level of authority) of the person delivering the message has a direct correlation to the target audience's favourable acceptance of the ideas put forth (McKenzie-Mohr, 1994). The ultimate goal is to gain a commitment from the individual or group. Individuals who make a small commitment, increase the likelihood that they will later engage in a more substantial behaviour. Pardini and Katzev (1984) and Burn and Oskamp (1986) found increased participation in a neighbourhood recycling program after residents signed pledge cards that requested

participation. Further, small commitments can lead to larger ones through a process known as cognitive dissonance. In brief, this theory suggests that individuals wish to view their behaviour as being closely related to their beliefs. When they are discrepant, they are likely to change one or the other to make them consistent (McKenzie-Mohr, 1994). The process outlined above was followed in the Pacific Gas and Electric study. Home owners, after requesting an energy assessment, were asked to peer up in the attic to inspect the insulation level and to place their hand on an uninsulated water heater etc. After being involved in this way, home owners were more likely to see themselves as committed to energy conservation. In addition, the assessor was trained to secure a verbal commitment from the person - "When do you think that you'll have the weather-stripping completed? .... I'll give you a call around then, just to see how it's coming along, and see if you're having any problems."(McKenzie-Mohr, 1994, 229).

Research has shown that the public understanding of the environment and their interaction with it is poor (Environment Canada, 1994). Since many homeowners will decide privately on their course of action, the model presented above underscores the importance of addressing several psychological variables in any contact initiated (McKenzie-Mohr, 1994). Failure to address these variables is likely to lead to low levels of participation and action in any program. Ideally any program should be focused and specific in order that the target group can clearly remember the information presented.

The model also identifies five key positional variables: disposable income, ownership of the property, skill levels, opportunity costs (time & energy), and phycological cost (will not participating make me look bad?)(McKenzie-Mohr, 1994). Each of these variables contribute to whether an

investment in the environment (monetary, time & energy) will be made. There is a historical precedent that investment in environmental causes is more likely to be undertaken by the more wealthy individuals (Environment Canada 1994). Those who rent tend to be less well off, with a greater percentage of their time occupied with the business of day to day living, and therefore less disposed to make an investment in the environment. Further, there is less incentive to make an investment in someone else's property (McKenzie-Mohr, 1994). Paradoxically, many of the skills required to effect positive environmental change rests in this latter group, for example, the simple installation of a low flow shower head by someone in the household as opposed to hiring a plumber (McKenzie-Mohr, 1994).

Behaviour change interventions are generally most effective when pleasant consequences are contingent upon the occurrence of the desired behaviour by the target individual (Geller, 1989). Positive attitudes associated with an effective behaviour-change technique maximize the possibility for the desired behaviour to become a norm - the socially accepted action (Geller, 1989). The positively reinforced consequences that have been applied to benefit environmental protection have varied considerably. Some consequences have been contingent upon the occurrence of a desired behaviour, whereas other consequence strategies did not specify a desired response but were contingent on a certain outcome (e.g. on certain level of environmental cleanliness, energy consumption or water savings) (Geller, 1989). The consequences can be distinct stimuli such as a monetary rebate, a self-photograph, or a verbal accolade in public. Consequences can also be opportunities to engage in certain behaviours (adding one's name to an "Energy Efficient" honour role, or attending a special resource recovery conference) (Geller, 1989). This is all in an effort to

"close the loop" and ensure the perceived benefit is recognized in a positive way by that target group (McKenzie-Mohr, 1994). This in turn encourages the target group to participate in other initiatives and to diffuse their new found information to others (the last two categories in the figure 2.2) (McKenzie-Mohr, 1994).

The final stage of the social marketing model is evaluation (Figure 2.1). Evaluating the effectiveness of a social marketing program is formidable. The use of quasi-experimental or randomized experimental designs is difficult for several reasons: (a) the setting, which can be a small community or a whole country, is often beyond experimental manipulation: (b) specifying objective and reliable measures of marketing effectiveness is problematic, particularly when the dependent variable is an unobservable attitude or a behaviour difficult to observe: and © the cost of conducting a large scale evaluation may be prohibitive, especially given the reductions in government funding (Geller, 1989). Because of these and other difficulties, marketing evaluations tend to be static, before - after comparisons, with no control groups (Bloom & Novelli, 1981). Furthermore, such evaluations are generally outcome based, and rely primarily on self-report indices. The lack of internal and external validity in a before-after design with no control group makes demonstration of cause and effect relationships ambiguous, if not impossible (Bloom & Novelli, 1981). Therefore, cost-effective measures and evaluation paradigms must be developed to provide clear interpretations of relationships between independent and dependent variables in a social marketing program.

2.3.4 Societal Guidance

During the 1960's, Amitai Etzioni presented his theory of 'societal guidance" and his construct of "interwoven planning". Societal guidance he defined as a combination of downward control and upward consensus formation (Etzioni, 1968). He further defined interwoven planning as "experiment(ation) with new organizations and techniques of contextuating control so as to link control more closely to consensus formation"(Etzioni, 1968: 486). The process of consensus formation was crucial to Etzioni. It is, he said, a process that is partly "guided" from above by the controlling "overlayer" of society and partially voluntaristic (Friedmann, 1987). In its overlayer, society requires technical elites and guidance institutions that are "responsive" to the needs of the non-elite population below them (i.e. technocratic planning; Does not the high degree of specialization required for a subwatershed study requires elites?). To Etzioni consensus formation was presented as a form of social mobilization (Friedmann, 1987). A simplified model of this process might look something like the Figure 2.3 below.

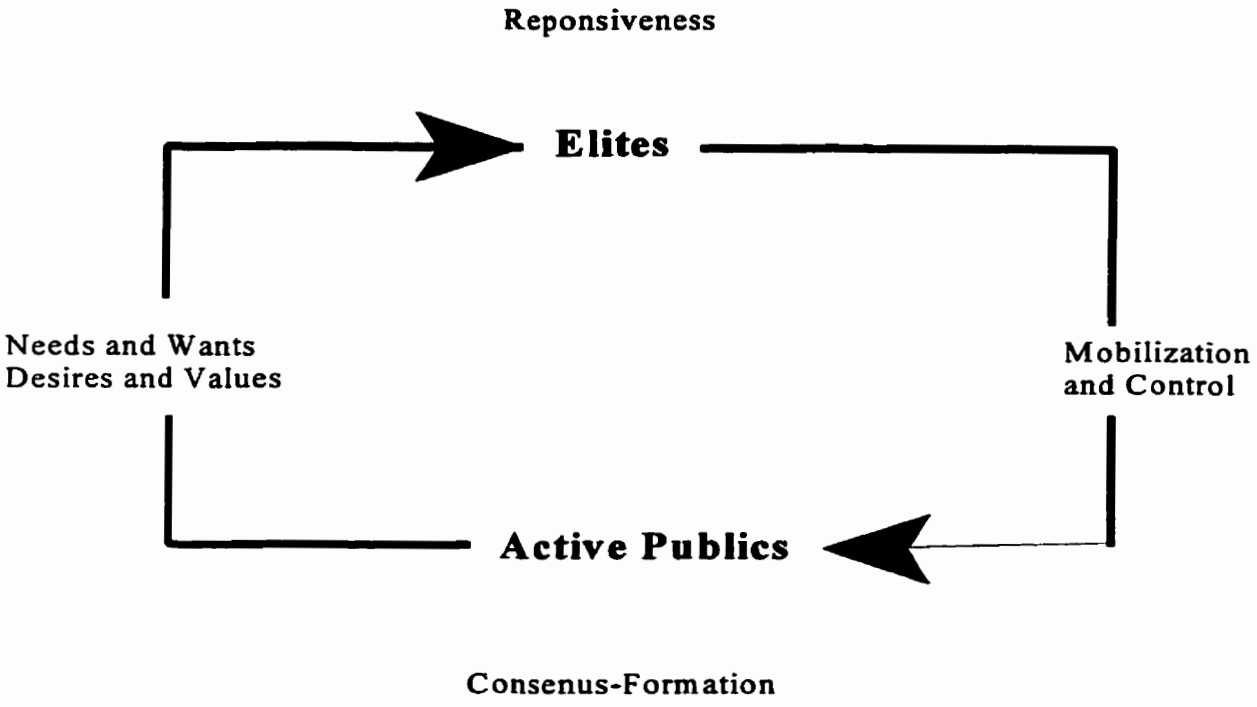


Figure 2.3: A simple model of Societal Guidance (Friedmann 1987, 116)

Etzioni was inspired by Mannheim's notion of an "active society" which meant to him " .. to be aware, committed, and potent" (Etzioni 1968, 5), in pursuing social objectives. Societal objectives, he suggested, are reached through a process of authentic consensus formation among the relative actors. He recognized that consensus often reflects the will of some members of society more than others, yet societies often evolve a shared pattern with conflict occurring with and around it (Friedmann 1987, 115). Further, collectivities have properties of their own and ... consciousness is one of them (Etzioni, 1968: 228). Being such a collectivity, the active society has, therefore, the "potential capacity to act in unison by drawing on a set of normative bonds" which binds its members. (Tugwell, 1940, Friedmann, 1987: 116). (Is this not similar to the scientific community's validation of knowledge?)

The role of interwoven planning can now be more clearly understood. Interwoven planning is part and parcel of the twin processes of consensus formation and societal guidance, preformed by elites (Friedmann, 1989). The interweaving is a matter of degree; at its worst it is a "participatory process outside the channels of politics" (Perloff, 1980: 253); at its best the elites and the active public can "engage each other in a rational discourse over the kind of regional life they would want for themselves" (Friedmann, 1987: 199). To be effective planners must tack close to the winds of power in order to stave off the continued threat of legislative controls over the public's actions (Etzioni, 1968: 488-489).

The concepts embodied in the community development literature (as applied to community economic development) provide a useful framework for a community environmental development model. These principles can be summarized as; encouraging people to work together to identify issues; developing a community response; focusing on direct public initiatives, participation, and action; increasing local autonomy; and enhancing local choices by enabling people to collectively achieving goals and influence actions (Caldwell et al, 1997; Douglas, 1987). These principles are achieved through a variety of methods some of which are:

- emphasis on local knowledge: Fundamentally, community development is from within the community and relies, in large part on local knowledge and the contributions of the community itself. The primary emphasis is on using local knowledge and resources.

- capacity building: Community development focuses on the process of enabling people to collectively achieving goals and influence actions. It encourages participation and direct public involvement with a goal of helping the community to develop the capacity to identify and respond to issues which challenge its future.

- collaboration: By focusing on the resources of the community there is an opportunity to bring together many participants, and develop partnerships. By bring people together that don't normally work together provides an opportunity to develop synergy and breakdown past barriers. Thus, a more holistic, diverse and coordinated response is achieved.

- participation: Community development initiatives benefit from participation of the entire community. Processes need to be established that encourage representation and participation from all groups, regardless of age, race or ethnic orientation.

- education: The development and enhancement of knowledge within the community is an important of community development - both from the perspective of sharing information and also from the perspective of developing new understanding and awareness of opportunities and challenges.

- direct public initiative and action: Community development seeks to focus on issues and affect change in those areas where the community has control. This focus on the *possible* and making it happen enhances community support.

- local control: Community development is about the community working from within to respond to change. It is bottom up in orientation and not top down. Upper levels of government may facilitate or assist but the fundamental responsibility rests with the community.

(Caldwell et al, 1997)

The role of the community development worker (CVC), is seen as being one of an animator or enabler (Caldwell et al, 1997), helping to build community capacity to undertake stewardship initiatives. They will strive to develop relationships and forge linkages between groups as well as being a repository for the communities information (Caldwell et al, 1997).

2.5 Summary

The first three sections of this chapter (2.1.1 thru 2.1.3) explained the environmental setting that stewardship programs operate in. It described the biological functioning and how it had been disrupted by human development and then proceeded to outline two remedies; greenways and buffers. The last section reviewed the best management practices for subwatershed No. 19 in light of this information. The rationale behind this section is to review the types of activities involved in stewardship. Participants in these programs will need to know these stewardship actions so that they can make informed decisions about what to volunteer for.

The next three sections evaluated the current environmental practices and declared them a failure in there ability to protect riparian areas. Section 2.2.2 looked to the research that had been conducted on landowner attitudes to determine what conservation programs had been successful. A review of this information indicated that many of the stewardship programs were aimed at the individual and that many authorities felt that this approach was not moving at quickly enough to stop the present rate of environmental degeneration. These same authorities maintain that if stewardship programs were more community based, that the exponential gain in public resources and awareness together with a reduction in the use of natural resources many allow society to reach a state of ecological sustainability.

Section 2.3 and its respective sub-sections explores the literature on public action in search of support for a community based stewardship program. The direction taken in the search was determined by the data uncovered in the study and lead to the three subsection of social learning,

social marketing and societal guidance. Given the numerous references in the literature that will be directly related to the case study, it can be concluded that the resultant model would have a good chance for success.

When the literature review is taken as a whole it forms the context for stewardship; were it has been; were it is; and a possible future direction. The problem stewardship programs try to overcome is the loss of environmental integrity. In trying to solve the problem it has to overcome legislative and institutional limitation. What this thesis tries to do is to develop a solution to both these problem simultaneously. The conclusion that was reached was to design a Community Environmental Development stewardship program.

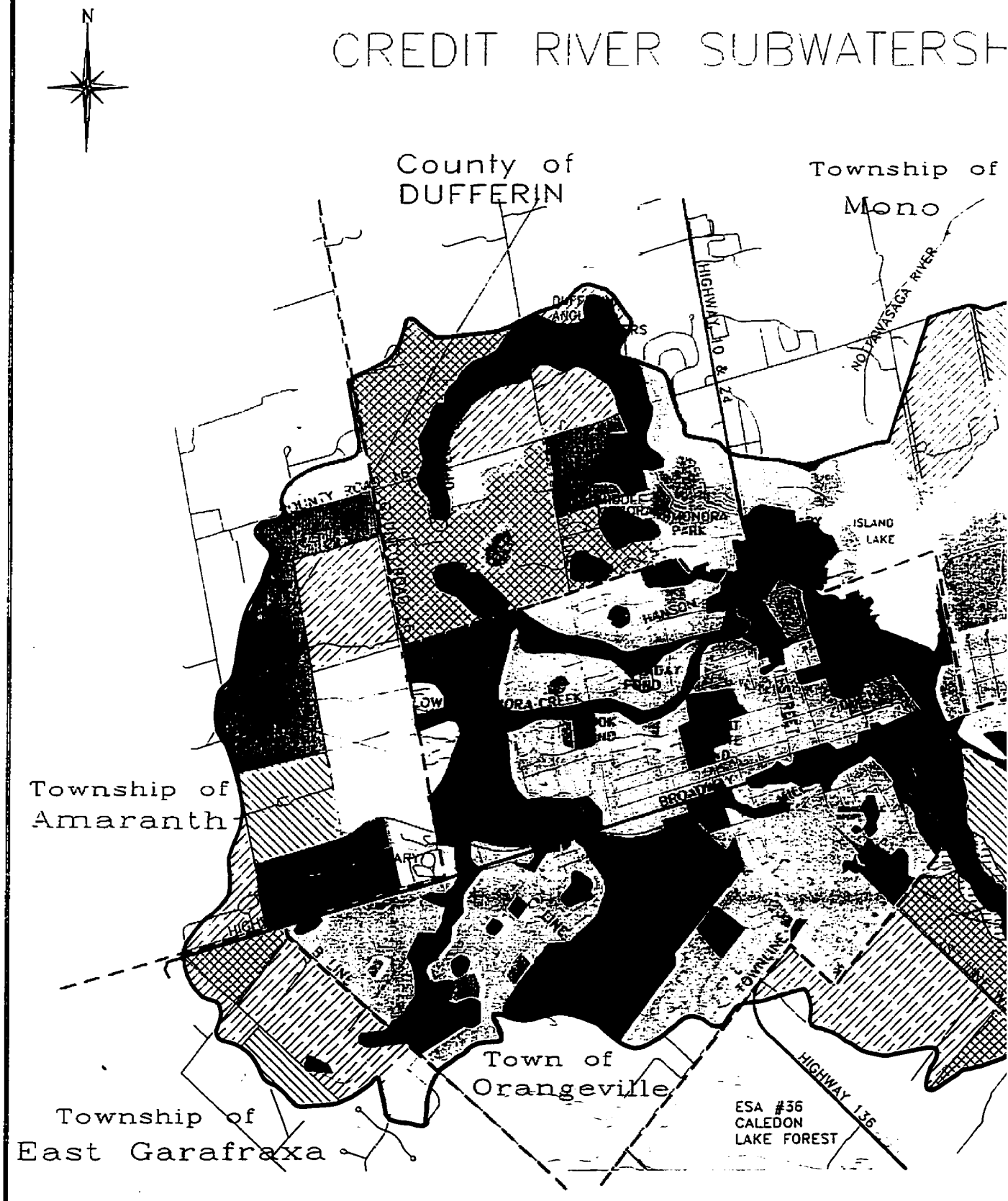
Chapter 3.0: Methodology

Section 3.1 through 3.1.3 (Subwatershed No. 19 Methodology), are background information and serve to put into context how and why this study came into being. Section 3.2 and it related sub-sections deals with the actual study design itself.

3.1 Background - General

Mill Creek was chosen because it presents a small scale urban stewardship situation and because a detailed subwatershed study of the area had just been completed. The land uses adjacent to Mill Creek range from industrial/commercial to residential to rural agriculture, which make it a challenging target in which to implement a stewardship initiative (see Figure 3.1). This is further complicated by the fact that future growth is anticipated at 15%, raising the total urbanized area to 75% of the lands contained within the boundaries of the Town of Orangeville.

The Town of Orangeville is the county seat for Dufferin County and is strategically located less than an hour north of Toronto (see Figure 3.2). Situated at the intersections of Highways 9, 10, 24, and 136 makes Orangeville easily accessible to the nearby provincial highway system. Within the last decade there has been unprecedented growth in population (9.6% over 9 yrs), which brings the current population to 20,605 in 1995. This growth brings with it increased numbers in the labour market and expanded commercial activities (Town of Orangeville, 1996). To attract new comers, Orangeville boasts its *variety of summer and winter recreational activities, and wonderful wildlife areas all within a 30 minute drive* (Town of Orangeville, 1996).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DUFFERIN
Township of
Mono
HIGHWAY 10 & 24
NOTTAWASAGA RIVER
ISLAND
LAKE
HANSON
Township of
Amaranth
Town of
Orangeville
Township of
East Garafraxa
HIGHWAY 136
ESA #36
CALEDON
LAKE FOREST

) 19 STUDY–EXISTING LAND USE

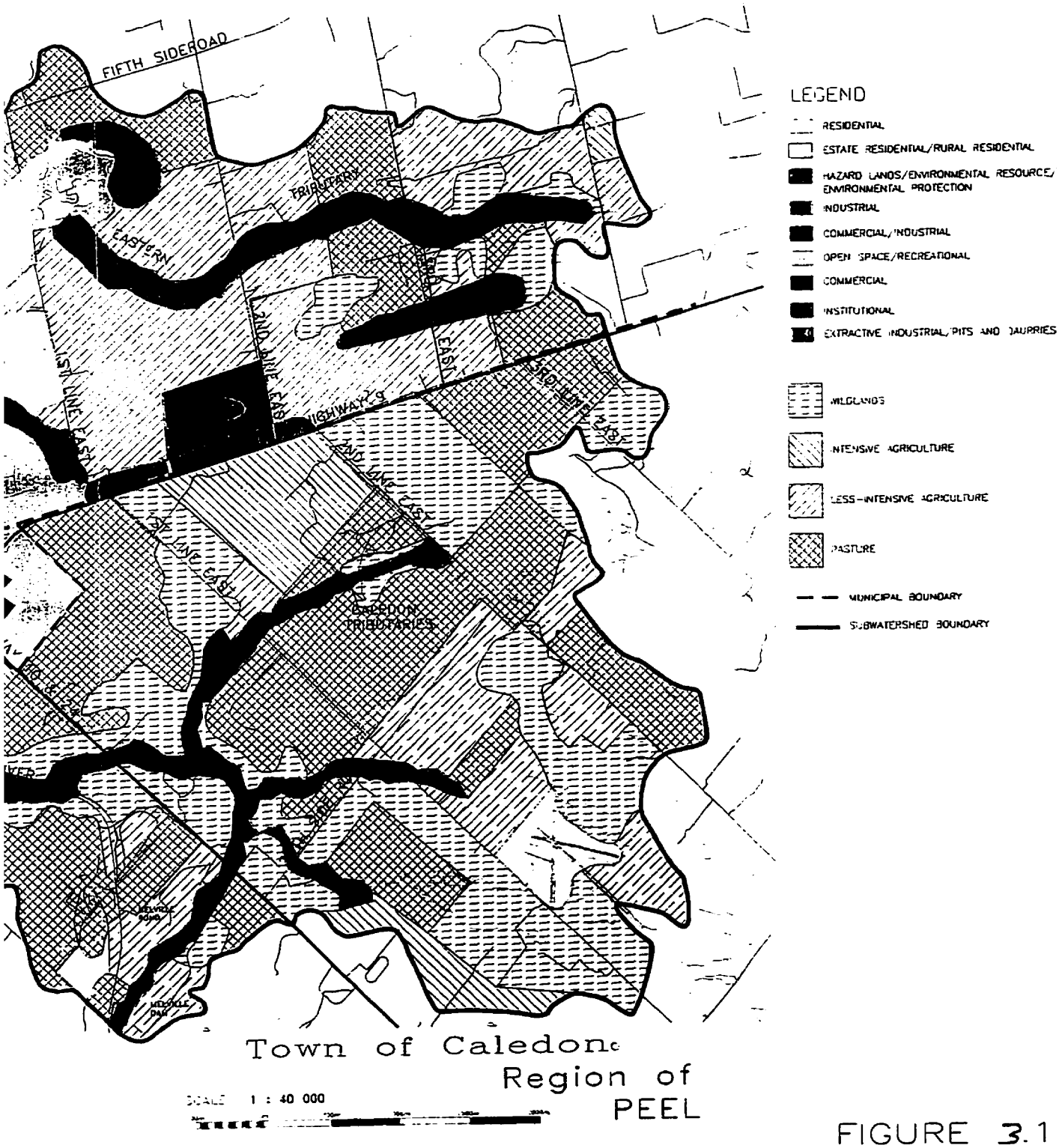


FIGURE 3.1

Figure 3.2: Regional Setting of the Town of Orangeville

3.1.1 General Physiography and Hydrology

The following section is presented as a geographical background of the study area. It attempts to illustrate the environmental richness that surrounds Mill Creek and to connect it functionally to the larger Subwatershed No. 19. Further detail of Mill Creek's environmental resources, as documented by the CVC, can be found in Appendix A.

Subwatershed No. 19 comprises a surface drainage area of approximately 62 km^2, of which the 92 ha^2 Mill Creek watershed is a tributary (CVC, 1997). The topography varies from 525m ASL from just north and west of the catchment area to 405m ASL just south of the mouth of Mill Creek (CVC, 1997).

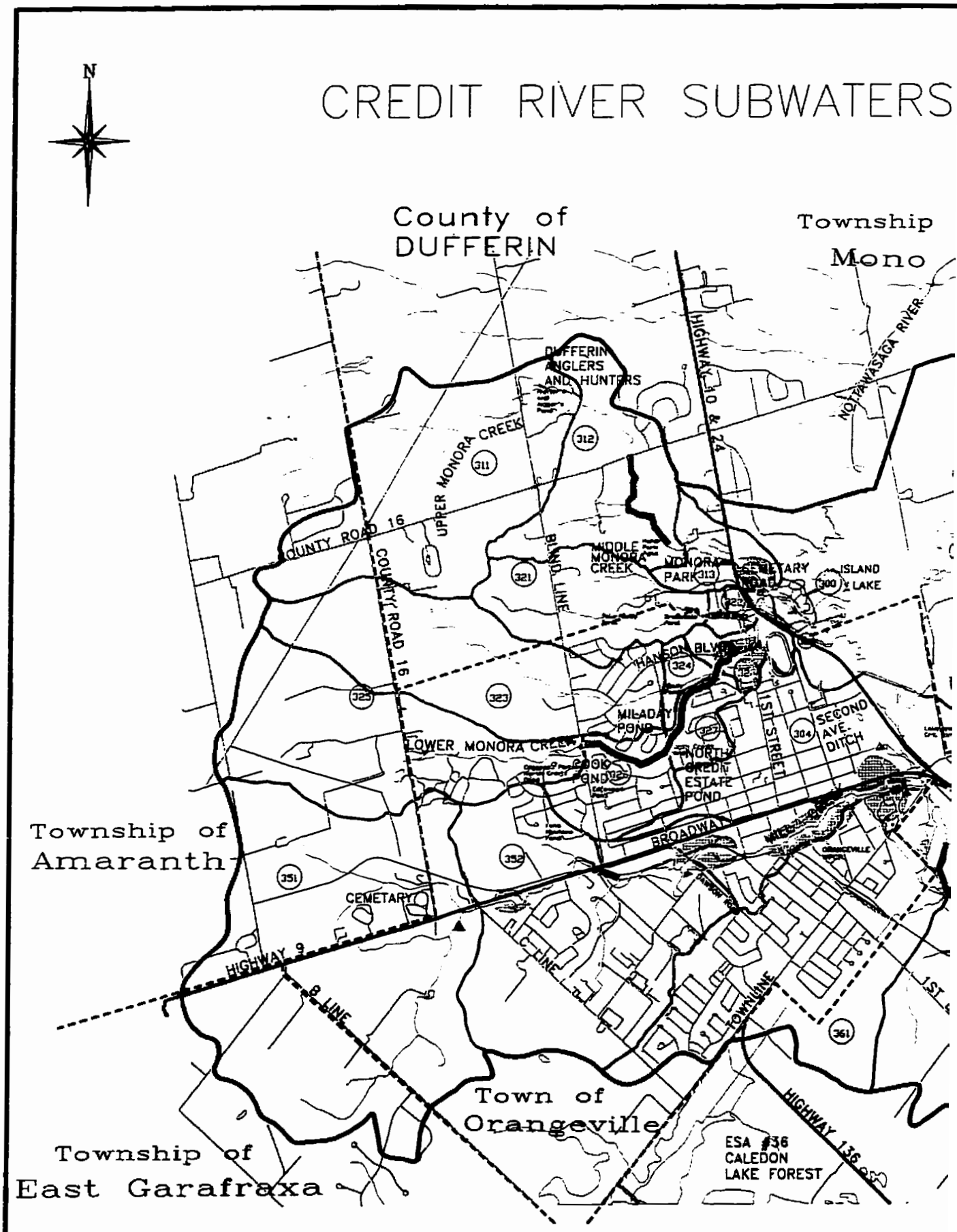
The most dominant feature in the subwatershed is the Orangeville Moraine. The generally hummocky overburden related to the Orangeville Moraine consists of extensive deposits of permeable sand and gravel, capped by less permeable sandy silty or silt clay tills (CVC, 1997). The underlying bedrock consists of fractured dolostone (CVC, 1997). The prevalence of sand and gravel in the area has given rise to numerous past and existing aggregate operations.

Numerous wetlands occur in the lower, flatter areas associated with the Credit River. A significant amount of precipitation recharges the permeable surficial sediments and soils within the subwatershed. The groundwater divide of Mill Creek extends to the west beyond the surface water divide and it is estimated an additional 6.0 km^2 area is available for recharge to the groundwater flow system in watershed 19 (CVC, 1997).

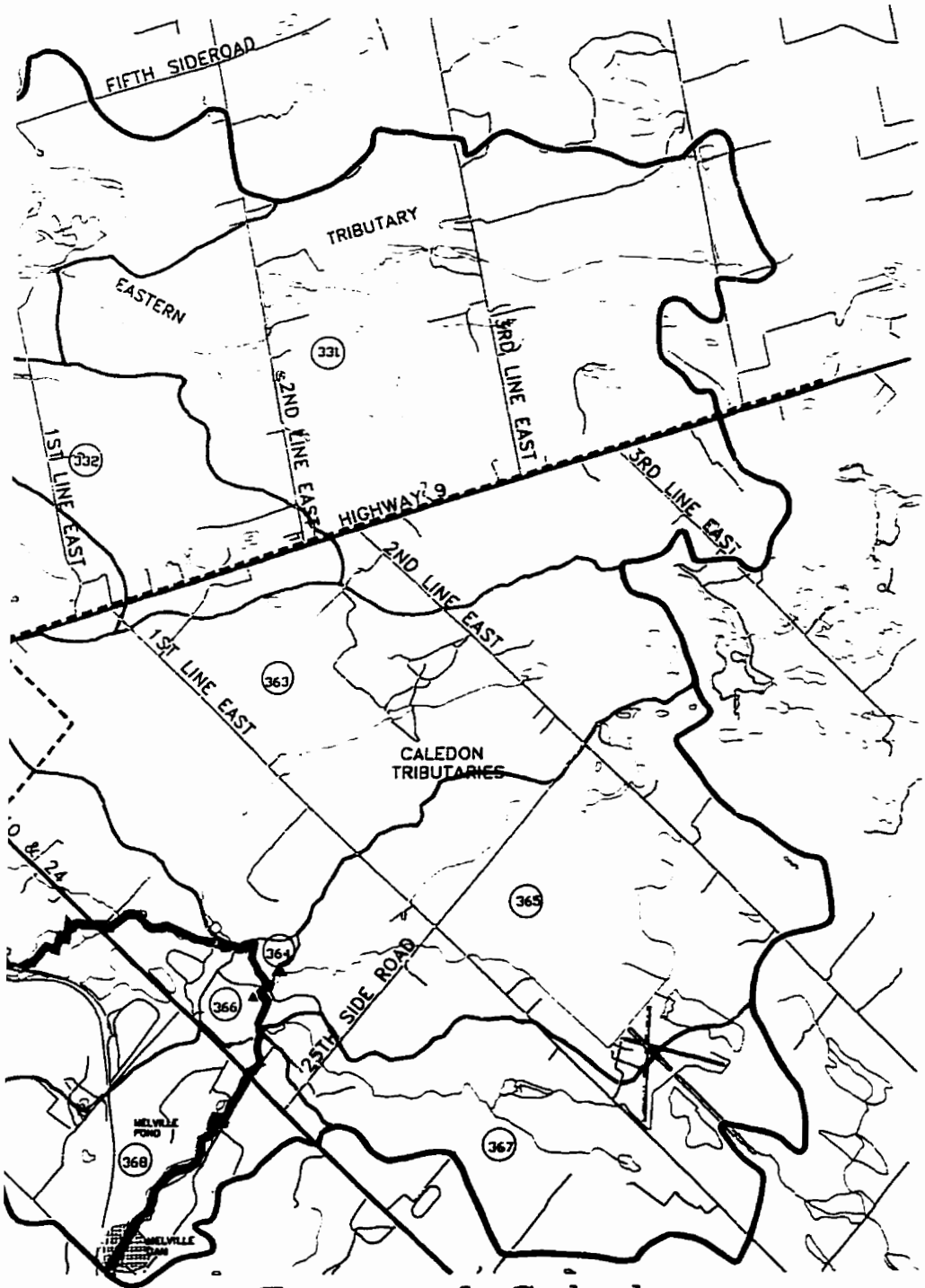
The headwaters of Mill Creek are characterized by rural land uses with good baseflow from groundwater sources (CVC, 1997). As Mill Creek flows towards the Credit River, it receives urban storm water runoff from the Town of Orangeville and becomes more channelized as it flows behind residential and commercial land uses. The combination of urbanization and channelization has made certain parts of the creek prone to floods (see Figure 3.3) . At the mouth of Mill Creek as it enters the Credit the water is very slow moving, with a wide channel and flows to the Melville Marsh ESA (also known as the Orangeville Marsh).

3.1.2 The Credit Valley Conservation Subwatershed No. 19 Study

In early 1992, the Credit Valley Conservation Authority, in concert with local municipalities, the Ministries of Natural Resources (MNR) and Environment and Energy (MOEE) completed a Watershed Management Strategy for the entire Credit River. The two phased study evaluated the present and future state of the *Watershed of the Credit River* with respect to its overall health (e.g., flooding, erosion, baseflow, surface and groundwater quality and quantity and the natural environment). The results of the study suggest that many areas within the Credit river Watershed presently support a healthy ecosystem. However, the results also show that, if not properly managed, further development within the watershed may result in a significantly degraded environment (CVC, 1997).


N
CREDIT RIVER SUBWATERS
County of
DUFFERIN
Township
Mono
DUFFERIN
ANGLERS
AND HUNTERS
HIGHWAY 10 & 24
NOTTAWASAGA RIVER
UPPER MONORA CREEK
311
312
COUNTY ROAD 16
COUNTY ROAD 16
BLIND LINE
MIDDLE
MONORA
CREEK
MONORA
PARK
313
CEMETARY
ISLAND
LAKE
300
321
322
HANSON BLVD
324
325
323
MILADAY
POND
327
1ST STREET
304
SECOND
AVE.
DITCH
LOWER MONORA CREEK
COOK
POND
326
NORTH
GREEN
ESTATE
POND
BROADWAY
Township of
Amaranth
351
352
CEMETARY
HIGHWAY 9
8 LINE
1ST LINE
TOWNLINE
361
Town of
Orangeville
HIGHWAY 136
Township of
East Garafraxa
ESA #36
CALEDON
LAKE FOREST

19 STUDY–WATER RESOURCES



LEGEND

- POTENTIAL FLOOD DAMAGE CENTRES (APPROXIMATE AREAS)
- LONG TERM STREAM STABILITY MONITORING STA
- (331) SUBCATCHMENT NUMBER
- TWO-ZONE STUDY
  FLOOD PLAIN MAPPING (1989)
  CREDIT RIVER FLOOD
  DAMAGE REDUCTION
  STUDY MAPPING (1988)
- DILLON MAPPING (1972)
- DELEUW-CATHER MAPPING (1979)
- TEMORARY PEAK WATER LEVEL STAFF GAUGE
- TEMORARY CONTININUOS WATER LEVEL STATION
- TEMORARY CONTININUOS WATER LEVEL STATION

Town of Caledon
Region of
PEEL

SCALE

FIGURE 3

The watershed study recommended that the entire Credit River Watershed be subdivided into 20 subwatersheds based upon the natural riverine boundaries, and that Subwatershed Plans be prepared in order to properly manage the overall health of the watershed. Subwatershed No. 19 is one of the 20 subwatersheds, and Mill Creek is one catchment area in the subwatershed. It is estimated that in excess of 90% of the Mill Creek catchment area lies within the boundaries of the Town of Orangeville.

3.1.3 Subwatershed No. 19 Methodology

Goals

The rational for the study was two fold; *to develop a long term management strategy to protect, enhance or restore environmental quality*; and *to provide a framework for those involved in land use planning and decision making to be able to evaluate the consequences of future development scenarios* (CVC, 1997: 1.3).

Objectives: The study objectives related to the four phases of the study and were defined as:

Phase I: Establish Existing Environmental Conditions
(e.g., identify form, function and linkages between the natural systems, - an ecosystem approach within a watershed based upon landscape features)

Phase II: Development of Alternative Ecologic Levels of Protection/Enhancement

Phase III: Select Recommendation Plan
- identify Best Management Practices that when implemented, will protect, enhance or restore the natural environmental resources,
- select a Recommended Subwatershed No.19 plan based upon social, economic and environmental considerations

Phase IV: Implementation
- through traditional planning tools i.e. O.Ps, Zoning etc,
- alternative methods to planning like stewardship,
- monitoring.

(CVC, 1997:1.4)

A summary of the study's Environmental Resources, Protection Targets, Best Management Practices and Future Study Requirements for Mill Creek are found in the subwatershed No. 19 document..

3.2 Study Design

The intent of this study is to uncover the levels of environmental behaviour, values and motivations of the citizens of Orangeville in order to form the basis for a stewardship program.

In order to do this the study is built around the concept of triangulation for developing structural corroboration (Guba and Lincoln, 1981). The following defines structural corroboration:

> *"Structural corroboration is a process of gathering data or information and using it to establish links that eventually create a whole that is supported by the bits of evidence that constitute it. Evidence is structurally corroborative when pieces of evidence validate each other, the story holds up, the pieces fit, it makes sense, the facts are consistent"* (Eisner, 1979, cited in Guba and Lincoln 1981:106).

Triangulation is a technique for increasing the credibility of structural corroboration through employing a variety (sometimes three) methods of collecting information or investigating a subject. Guba and Lincoln (1981) describe the triangulation process this way:

> *"... exposing a proposition (for example, the existence of some issues or concern; the validation of some alleged fact; the assertion of an informant) to possibly countervailing facts or assertions or verifying propositions with data drawn from other sources or developed using different methodologies"* (pg. 107)

The following sources were used for triangulation in this research:

- A door to door survey administered by the researcher and a study team from the University of Guelph in March of 1997;
- Semi-structured interviews, (that used the above survey as a guide) administered by the researcher, conducted with residents of Orangeville;
- Transcripts from an open house conducted in November of 1994, for the Subwatershed No. 19 study, focused on its goals and objectives.
- Numerous discussions by the researcher with experts connected with environmental issues in and around the Town of Orangeville. Also the researcher presented information on this research to the public at an open house that presented the Subwatershed No. 19 study to the public.

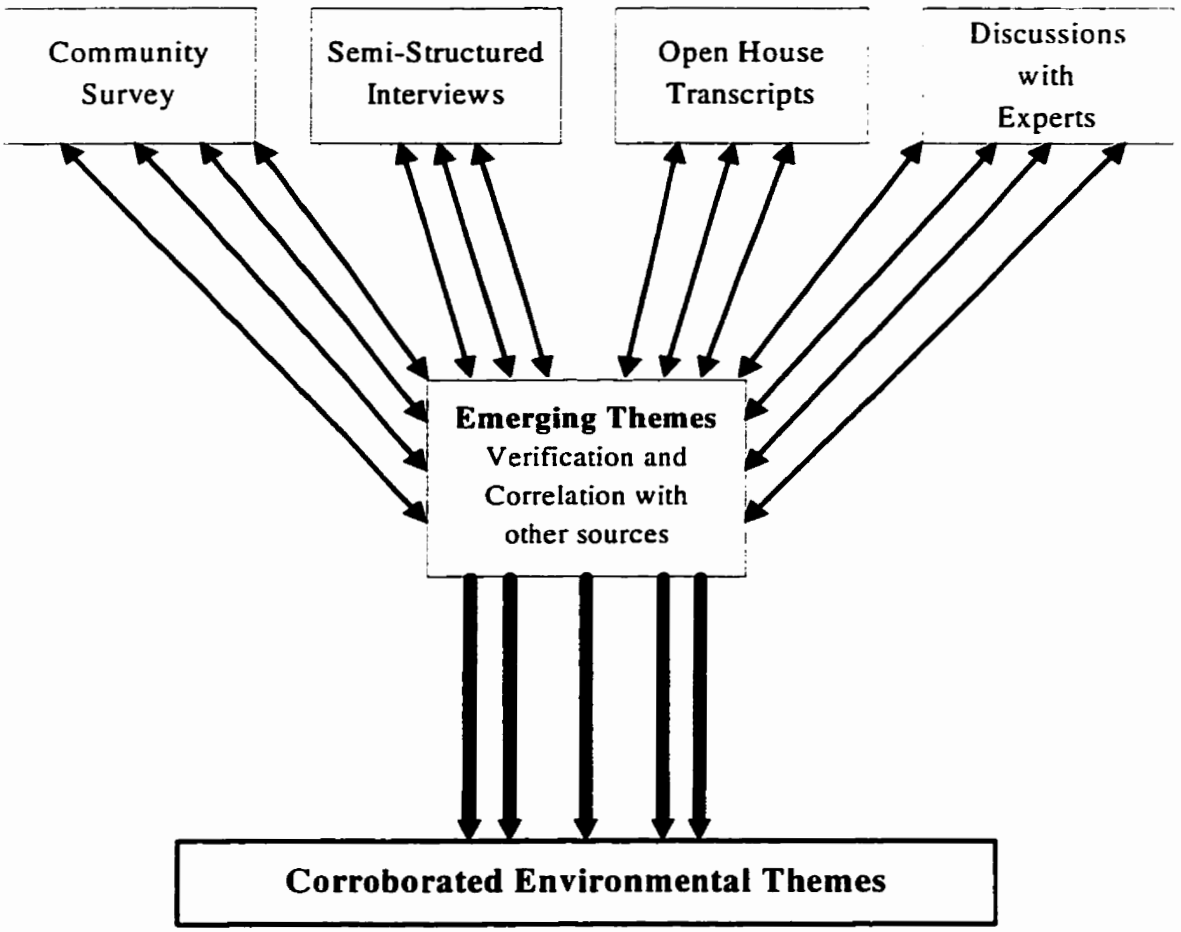


Figure 3.4: Conceptual diagram of the Triangulation Method used to uncover the environmental themes centred around Orangeville and Mill Creek.

Several themes emerged from each research source, these are then triangulated with one or more of the other sources. Figure 3.4 diagrams the validation of themes through the triangulation method.

3.2.1 Survey Method

The intent of the survey was two fold. It was designed to uncover the environmental behaviour and values of the citizen (primarily landowners) of Orangeville, as well as their motivations to participate in environmental programs. Secondly, it was aimed at uncovering their values and perceptions about Mill Creek.

The purpose of the research overlapped with work being done by a fourth year undergraduate class. Their goal was to assess the environmental awareness of the residents of the Town of Orangeville and to create an educational pamphlet to address the community's needs. The creation of the survey was a joint effort between the eleven undergraduates and the researcher and it was administered together. The initial results of the survey (i.e. frequencies and distributions) were arrived at jointly but the detailed analysis reported in chapter 4 and 5 are a result of this research.

The survey questions evolved around five subjects: (1) household environmental behaviour; (2) perceptions of the local environment; (3) motivating factors to become more involved in environmental programs; (4) level of knowledge measured both directly and indirectly; and (5) demographic information. For those that lived close to Mill Creek a sixth section was added aimed at uncovering their perceptions of the Creek.

Part one above was then compared to the Statistics Canada report 'Household and the Environment' (1994) in order to standardize the variables and for future comparison. Parts two, three and four from above were compared to other theses conducted by University of Guelph graduate students in the

areas of stewardship. Two sources of particular help were, Susan Sirrs (1995) for the questions on buffers and Darin Dinsmore (1995) for the perceptions and motivations sections. The final section on demographics parallelled the categories outlined in the 1995 Canadian census.

The completed survey was reviewed by Mike Puddister and Bob Morris of the CVC; scrutinized by two professors, Stew Hilts and John FitzSimons; and analysed by the Human Subject Committee at the University of Guelph. On the 25th of February it was pre-tested at the Subwatershed No. 19 open house, after which some minor adjustments were made. The final survey that was administered can be found in Appendix D.

Sample Size

To obtain survey results with a 90% level of confidence with a population of approximately 20,000 people, it was determined that a sample size of 305 was required. This was determined through the use of a 'Lotus 123' program designed to calculate sample size. The only assumption made in this numbers determination was the proportion of the total population that exhibited the environmental characteristics being tested for. This was assumed to be 35% based upon the data presented in the 'Households and the Environment (1994)' study by Stats Canada, particularly the rural areas within the Ontario section. At the conclusion of administering the survey there were 280 completed surveys, which results in +/- 5¼% error.

Six teams of two people each (comprised of the 11 undergrads and myself) conducted the survey between the dates of March 7th to March 9th, 1997. Prior to administering the survey the researcher

rehearsed the undergrads in the delivery of the questionnaire to insure consistency. The teams then went to Orangeville and contacted people randomly (those who were at home, and agreed to answer the survey) on a door to door basis in residential areas through. The areas surveyed are marked on a map contained in Appendix D. Times of contact with the residents were staggered throughout the day, over the three day period, and the researcher monitored the survey process throughout. To encourage a greater response rate and to establish trust though the guarantee of confidentiality, the surveys were kept anonymous. This meant that no follow-up calls or 'thank-you' letters were sent out. However, people who did participate in the questionnaire did receive a free family pass to the Island Lake Conservation Area, compliments of the Credit Valley Conservation Authority.

The survey responses were then coded and entered into a spread sheet (response rate could not be determined due to limited recording but was generally acknowledged by the surveyors to be high, i.e above 90%). These results were then transferred into the statistical package, SPSS, for analysis. Although in some cases not all of the 280 respondents provided answers for every question, these were either interpreted as 'no response' or 'not applicable'. This allowed for a base figure of 280 for all the questions. The four questions on Mill Creek were based on a sample of 154. Any additional comments were recorded, although not coded, and added weight to answers in the semi-structured interviews.

3.2.2 Semi-Structured Interview Method

Semi-structured interviews that used the survey as a guide were conducted to better understand the responses given on the survey by the citizens of Orangeville that participated. Essentially, the interviews were simply longer versions of the survey, that permitted more detailed answers. They were conducted by the researcher (myself) and administered during the same period of time that the survey occurred. Selection of candidates was at random but was confined to the immediate vicinity of Mill Creek. Twelve interviews were conducted with participants ranging from a retired gentleman to a single mother. Of the people contacted door to door, the researcher was only refused by two people, one because they were unavailable, the other because they were on their way out.

Each semi- structured interview ranged from 45 to 90 minutes. A brief introduction stating the CVCs interest and why the research was being conducted started the process. Participants were then asked questions on the survey in order to get them comfortable. Once trust had been established, the participants were encouraged to elaborate on areas that they felt strongly about, such as the value of buffers or how they felt about Mill creek. Open ended questions were used to encourage elaborate responses and clarifying questions used when the interviewer was confused.

It is worth noting, that it was sometimes difficult to establish an informal atmosphere initially. This was because a graduate student is often assumed to be an expert. To over come this it was often necessary to state that the purpose of the research was to find out what they (the participant) thought and felt. When this was done and the interviewee encouraged with open ended questions, it served to relax the participant and resulted in more complete responses. The responses were recorded on

the survey sheet using a combination of highlights, short answers and notes. Since there were only twelve surveys they were not coded. Analysis was based on comparison of the notes and drawing out similarities and differences based upon the five themes of the survey presented in the previous section.

One limitation of this type of interview is the ability to record everything. It was felt that a tape recorder would be intimidating for the average person, especially in their own home. It was also difficult having to write things down quickly and accurately, while conducting an interview. The second limitation was the short period of time the study was conducted over (late February to June). Although the process allowed for valuable insight into people's motivations it did not allow for a feed back loop to verify these perceptions at a later date.

3.2.3 Open House Transcripts

The first open house and public meeting for the Subwatershed No. 19 study was held on November 23, 1994 at the Orangeville Town Hall. The objective of the open house was to obtain public opinion with respect to:

- the resources that were most highly valued, or used by the public;
- environmental issues, and relative importance
- the perception of the public with respect to the environmental health of Subwatershed No. 19, including recent trends; and
- study goals and objectives.

The open house was held from 2:00 - 4:00 pm. There was a slide presentation of the watershed at the public meeting held at 7:00 pm on the same day. Following the presentation, working groups were formed to discuss the study goals and objectives. In total, approximately 75 people attended. The results of these sessions are courtesy of the CVC.

3.2.4 Discussions with Experts

There were many people involved in this research, all of whom have been working in the Orangeville area for several years. Of particular note were Bob Morris, Mike Puddister, and Jackie Thomas from the CVC, and Allen Young from the Town of Orangeville. The information was collected over several months through informal discussions. Once the survey data had been analysed, six broad questions centred around the emerging themes were asked of these people . The aim was to see how the experts perceived what they were being told without the questions being too leading. These perceptions had the benefit of verification right up until the final draft. See Appendix C for recorded results.

3.3 Summary

The results from each of the four data sources is presented in chapter 4. The data from the survey is reviewed in detail where as the other three sources are simply summarized with the raw data being put in an appendix where indicated.

4.0: Data Analysis

The first six section of this chapter present the data from the survey. Five of the sections correspond to the categories outlined in the methods section; demographic information, household behaviour; perceptions and knowledge of the local environment; motivation and participation and information on Mill creek. The sixth section tests the data to see if there is a statistical significance between age, education and the environment that has been suggested in the literature. The emerging themes from the survey are summarized in section 4.7.

Sections 4.8 through 4.11 summarize the other three data sources; the semi-structured interviews; information from the open house; and discussions with the CVC and the town of Orangeville.

Section 4.12 analyses the four data sources in terms of their content. The criteria used was Kruger's (1994) categories of: consideration of words; consideration of context; consideration of the frequency or extensiveness of comments; consideration of intensity of comments; consideration of the specificity of the responses; and finding the big idea. In addition, any significant statistical patterns were noted

The above analysis produced three themes that were supported by 21 attributes. This is presented in a consolidated matrix of themes in section 4.13.

4.1.1 Population Demographics

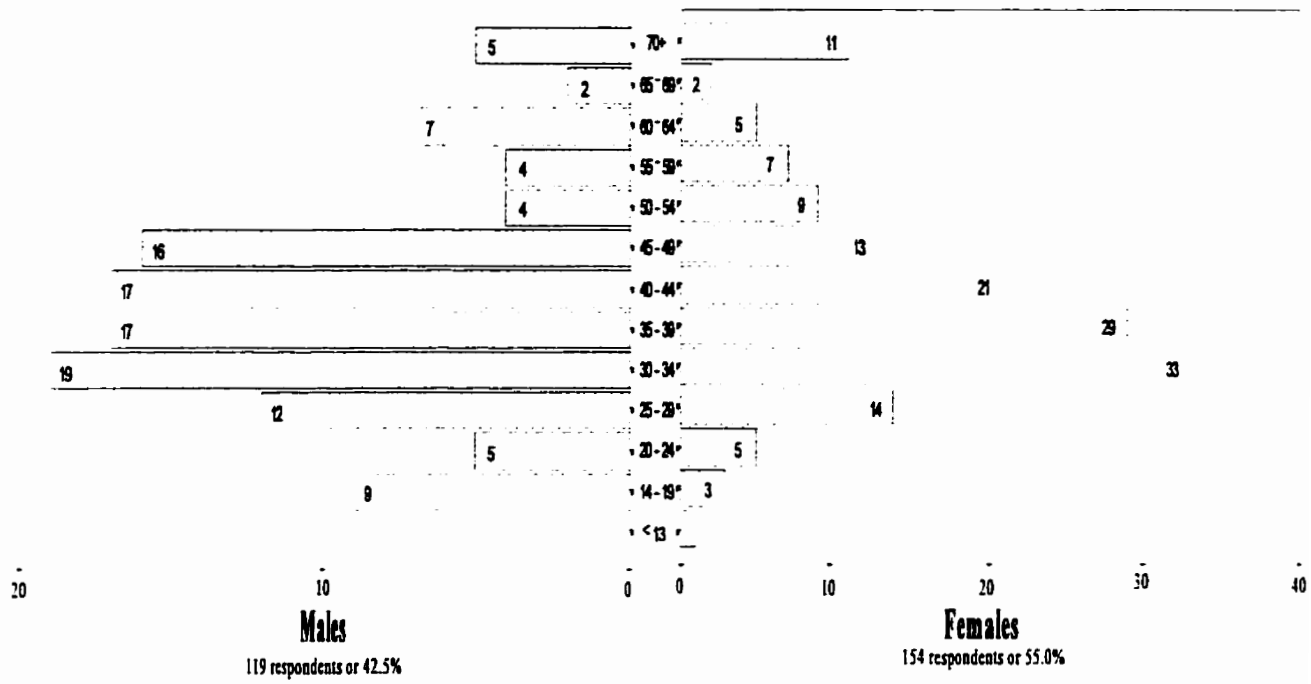


Figure 4.1: Population Pyramid of the survey sample from the citizens of the Town of Orangeville. Four people did not indicate their sex and seven people declined to reveal their age.

When the demographics of the survey sample are compared to the demographics of the population of Orangeville it would appear to be representative of the entire Town (Town of Orangeville, 1995). The major exception is the 14 - 19 and < 14 groups which are under represented. The largest response group was the 30 - 34 years age category which represented 18.9% of total respondents. This age category is the second largest in the Orangeville demographic profile.

Results from the survey indicate (see Appendix E) that almost one third (32.1%) of the families in Orangeville have four members. Five member and three member families accounted for 20% and 14.3% respectively of the total number of people surveyed. Given these figures, a urban stewardship program may be able to target these young families to affect change.

Overall, the survey reflects Orangeville's fairly young community with 67.5% of the surveyed residents being below the age of 45 years. It has been found that environmental attitudes are statistically significant and that they are negatively correlated with age (Arcury 1990; Scott and Willits 1994). This would then suggest that Orangeville should be a community of fairly high environmental knowledge and concern.

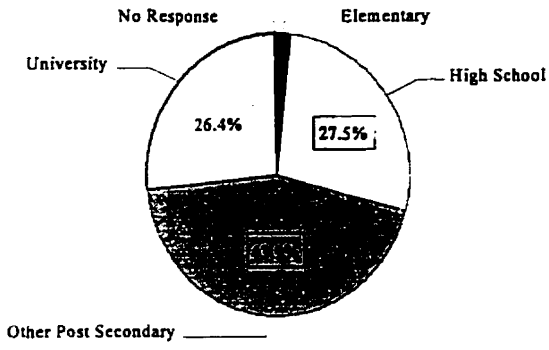


Figure 4.2: Education levels of the Respondents

4.1.2 Education

The greatest percentage of survey respondents indicated that they have completed a college or post secondary education program (43.9%). Of the people that answered this question, 27.5% completed high school, 26.4% have graduated university and only 1.8% only have an elementary school education. The persons level of education has been found to be the strongest predictor of environmental attitude and actions. Generally, those people that are young, educated and politically liberal are the most environmentally concerned (Scott and Willits 1994).

4.1.3 Occupations

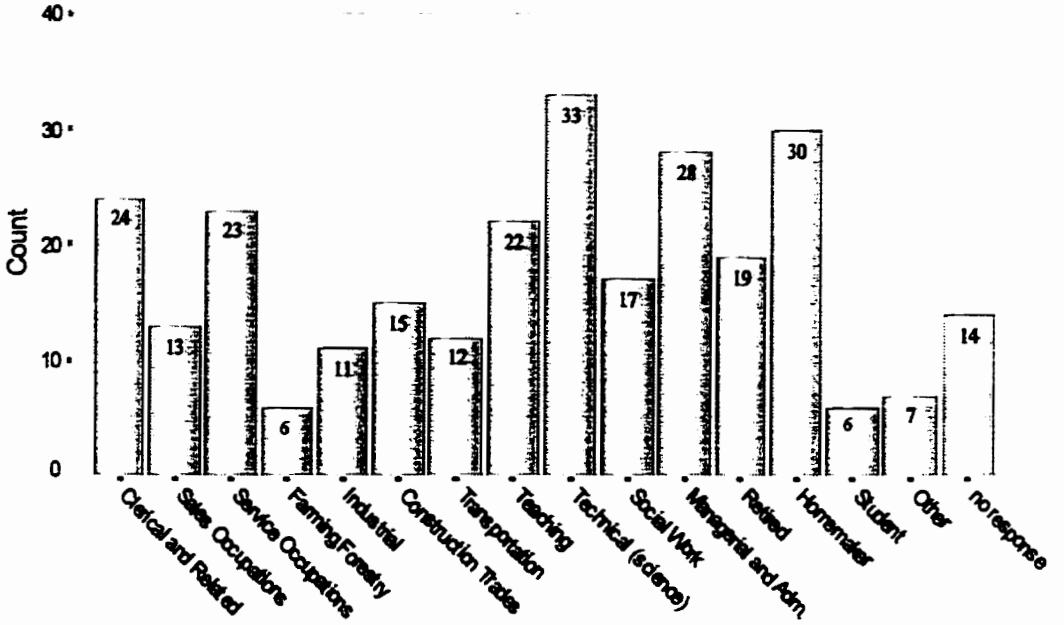


Figure 4.3: Occupation of Respondents based on Statistics Canada catagories.

There was not a clear occupation that dominated the people surveyed. This would seem to indicate that Orangeville has a relatively well balanced employment distribution, thus insulating it from negative effects if one sector of industry were to face a down turn or even collapse. Scientific and technical occupations accounted for 11.8% of the responses, followed by people employed as homemakers (10.7%) and in managerial and administrative roles (10.0%). If one combines the people that are retired with the homemakers there is almost 17% of the population that traditionally have more time for volunteer activities.

4.1.4 Income

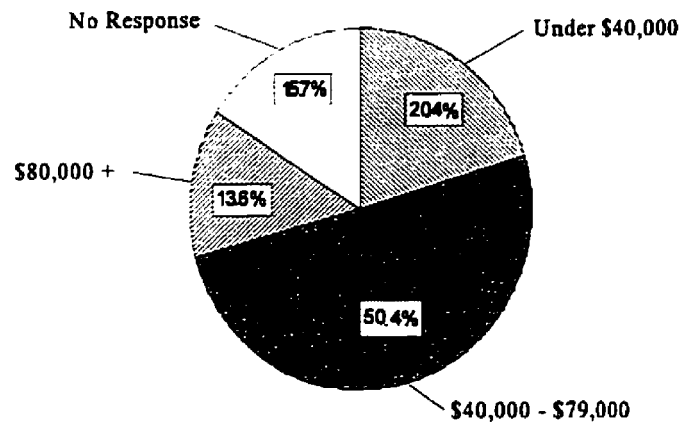


Figure 4.4: Income Distribution of Respondents

There is considerable debate as to the relationship between a persons level of income and their concern for the environment. The theory is that if a persons basic necessities are taken care of, then they have the freedom to consider the environment. Scott and Willits (1994) would support this position stating that there is a positive relationship between the two. Arcury (1990) is not so sure and suggests that there only exists an inconsistent relationship. Regardless, with over 50% of the respondents indicating that they have a household income of between $40,000 - $79,000 and 13.6% above $80,000, many of the citizens of the Orangeville appear to have their basic needs being met.

A large percentage of the respondents (15.7%) refused to answer this question. It can be speculated that many of the participants felt reluctant to respond because they did not see the relevance or that they simply were sensitive to the question.

4.1.5 Other

The survey indicated that most people read their local paper. About 79% of the respondents read the Banner and 81.8% read the Citizen on a regular bases. Both these papers are very active in the local seen, as was evidenced by their presence at the Subwatershed No. 19 open house. Another method of communication that was shown to be emerging was the Internet. A full 38.9% of the people indicated that they had access either at home at some convenient local location.

4.1.6 Property Demographics

The majority of the people surveyed owned their own property (88.6%), with only 11.1 % of the people renting. This result reflects the undergraduates requirement that the survey focus on the individual landowner. Consequently the majority of the homes surveyed were single detached homes. A full 94.6% of the households used their property for residence purposes only and did not have either commercial (including services) or industrial activities associated with them. These categories were basically insignificant and the results can be found in Appendix E. It should be recognized that with the changing nature of work that there is an expected increase in the number of people that will work out of their home in the future.

4.1.7 Number of Years at Current Residence

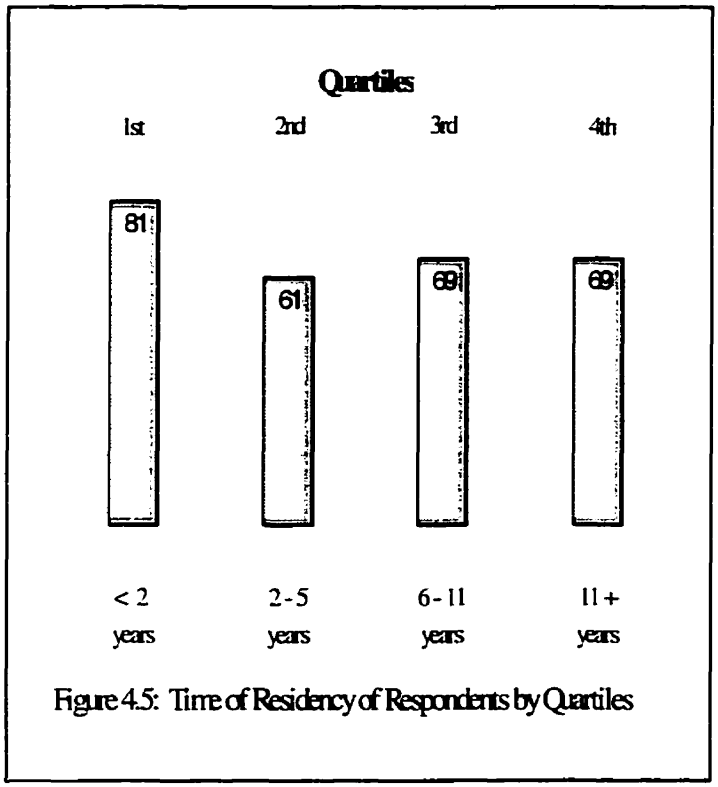


Figure 4.5: Time of Residency of Respondents by Quartiles (approximate)

The mean residency time for the participants was 7.18 years, with a standard deviation of 6.87 years. As can be seen from Figure 4.5, 25% of the people interviewed lived at their residence for less than a two year period. A full 50% of the people had lived in their current house for less than 5 years. This would seem to parallel the indicated growth in population that was reported previously. If in fact most of the people are new to the area, their knowledge of the community may be limited. Only 2.8% of the participants had been in the same house for at least 24 years or more. (Note: the fourth quartile includes 14 people that did not respond to this question.)

4.1.8 Property Size

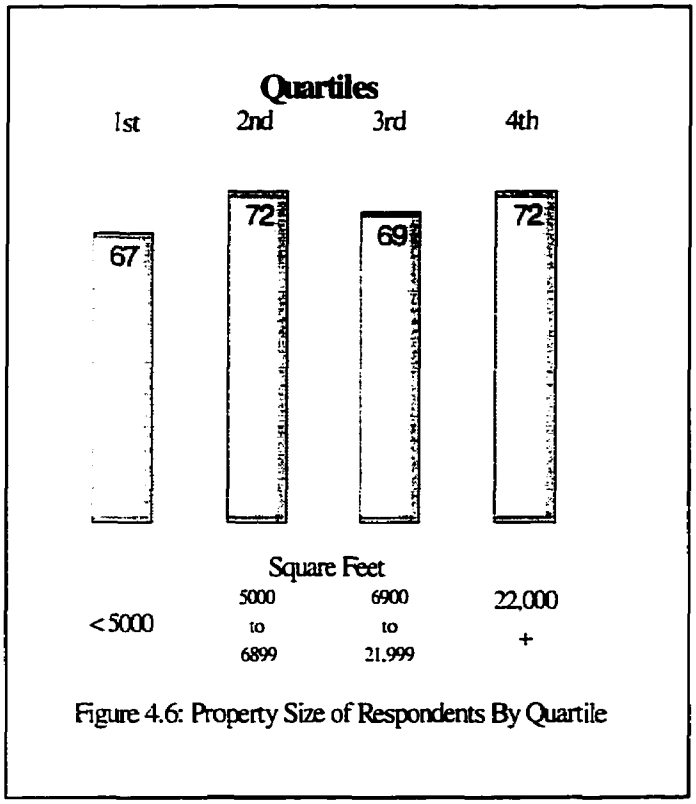


Figure 4.6: Property Size of Respondents By Quartile

Figure 4.6: Property Size of Respondents by Quartile *(approximate)*

The average size of the participants properties was 11,234.08 sq. ft. but there was a standard deviation of about half this which indicated a large degree of variation in property size. Half the households had a property size less than 6900 sq. ft. with the majority of these being around the 5000 sq. ft. mark (see Figure 4.6). Only 1.1% of the properties are larger than 100,000 sq. ft., which indicates that the majority of the properties were urban rather than rural.

There were two significant activities that people did on their property; thirty-five percent of the people had vegetable gardens, and 86% flower gardens (people that had both are included in these figures). The percentages of the remaining activities that people engaged in on their property are as follows: 12.9% had pools, 10.7% maintained a workshop of some kind, .7% had a hobby farm, and the other people refrained from any significant activities on their property or did not respond. Also, of the households surveyed 96.4% were on the town sewer system.

4.2 Household Behaviour

4.2.1 Recycling

Geographic Area	Paper	Metal	Glass Bottles	Plastics	Special Disposal
Ontario	77.6%	76.8%	76.5%	71.6%	27.5%
Urban areas in Canada < 30,000	75.3%	77.3%	77.3%	-	-
Orangeville Survey	96.2%	81.5%	91.2%	92.9%	65.7%

Table 4.1: Comparison of the levels of participation in recycling programs in Orangeville to the rest of Ontario and to urban areas of less than 30,000 people in the rest of Canada. (Ontario and Canadian figures from Households and the Environment, Statistics Canada 1994). n=280. [NR

The results of the recycling question are interesting for two reasons. First it shows that the citizens of Town of Orangeville recycle at levels significantly above the 1994 Ontario and Canadian averages. This is probably due to the proximity to the greater Toronto area which allows the Town to have significant advantages, in terms of design and the economy of scales of their operation, through partnering with other local municipalities. The second thing these figures imply is the success that a well designed social marketing program can have. Through a well run media campaign and offering people simple alternatives to their past practices (i.e. blue boxes) people have altered their behaviour. One must still view these high figures with some scepticism since there is a strong possibility that people responded so as not to be viewed negatively. Regardless, the fact that they recognize that their behaviour would be seen as unacceptable can still be seen as a partial victory.

The high percentage of people that are disposing of speciality products in a responsible manner is encouraging. People, it would appear, are recognizing that petroleum products and other hazardous waste can no longer be merely dumped. The secondary markets for used oil and the availability of easy disposal on special days by the Town are the main reasons for these levels

4.2.2 Yard Practices

Geographic Area	Pesticides	Fertilizers	Composting
Ontario	34.3%	50.7%	30.3%
Urban Areas in Canada < 30,000	28.3%	45.5%	22.9%
Orangeville Survey	42.5%	73.2%	52.1%
No Response in Survey	5 people n=280	2 people n=280	1 person n=280

Table 4.2: Comparison of yard practices of the respondents to Ontario and to urban areas of less than 30,000 people in the rest of Canada.

The people surveyed indicated that they used pesticides (42.5%) and fertilizers (73.2%) at higher rates than the rest of Ontario or Canada which could be considered bad for the environment. Conversely, the percentage of respondents that composted was significantly higher than the rest of the countries averages which is would be good. All three of these categories are prime targets for social marketing programs that would aim to improve peoples' actions (i.e. decrease use in the cases of pesticides and fertilizers and increase the number of people who compose) .

Salted Drive and Walkways	43.9%
That Did Not	54.6%
Used Alternative	1.1%
No Response	.4%

Table 4.3: Percentage of respondents households that salted their driveways and walks in the winter. 1 NR, n=280

The results of the number of people using salt on their driveways and walkways is almost split in half between those that did and those that did not. Perhaps, a better methods of solving this problem rather than marketing would be to change the local by-laws, prohibiting the use of salt on drive and walkways. This may be just as effective and more cost efficient.

Number and Type of Trees Planted

Type of Tree Planted	**Frequency**	**Percentage**
Birch	21/408	5.15%
Cedar	20	4.9%
Fruit	22	5.39%
Fir	1	0.24%
Lilac	10	2.45%
Maple	47	11.52%
Mulberry	7	1.72%
Pine	23	5.64%
Spruce	59	14.46%
Walnut	6	1.47%
Willow	7	1.72%
Other	17	4.17%
Did Not Specify Type of Tree Planted (At least once/three rounds)	168	41.17
Total Number of Possible Responses (three rounds of responses)	408	100%
Did Not Plant trees	110	
Mean Number planted per household: - 6.44 yrs, std.dev. - 4.45 yrs Mean Number of years ago planted: - 6.91 years, std.dev. - 3.81 yrs		

Table 4.4: Number and type of tree planted by the participants in the survey. n =280. 34 NR

Respondents were allowed to select up to three different types of trees that they had planted on their property. Therefore the sum of the total number of possible responses was 408 (280 less those that did not plant a tree (110) and less 35 no responses = 136 x 3). The most popular tree planted was a spruce, which is probably because people included the ornamental shrub when they considered this category. Next popular tree was the Maple. Of those who planted trees the average number of trees planted was between eight and nine. Two conclusions can be derived from these results. First, a tree planting campaign that stressed the value of trees would have a significant proportion of the population to target. Second, any program that aimed to educate people about native species might help to broaden the distribution of trees planted.

Dogs and Cats

	Stooped & Scooped	Did Not Stoop and Scoop	No Response	Row Totals
Dog	21 - Ran freely (25.6%) 61 - Fenced in (74.4%) 82 Total (93.2% of Dogs)	3 - Fenced in 3.4 % of Dogs	3 3.4% of Dogs	88 (31.4%)
Cat	1 - Fenced in	1 - Ran Freely	63 (96.9%/ Cats)	65 (23.2%)
Both	5 - Ran freely (18.5%) 22 - Fenced in (81.5%) 27 Total (87% of Both)	2 - Ran Freely 1 - Fenced in 3 Total	1	31 (11.1%)
Neither			96	96(34.3%)
Column Totals	110 (39.3% of animal owners)	7 (2.5% of animal owners)	163 (58%)	n=280 100%

Table 4.5: Percentage of respondents that Stooped and Scooped after their animal.

If it is assumed that the 63 cats that are in the 'no response' column are there because they use a litter box, then there are 173 respondents out a of possible 184 pet owners that mange their animals litter. It was encouraging that most of the animals were either fenced in or restrained, which keeps them from surface water supplies.

4.2.3 Water Conservation Practices

Geographic Area	Low Flow Shower Head	Low Flow Toilet
Ontario	44.9%	18.0%
Orangeville Survey	40.9%	8.0%

Table 4.6: Comparison of percentage of respondents who have installed low flow shower heads and toilets to the rest of Ontario.

Water Conservation Behaviour

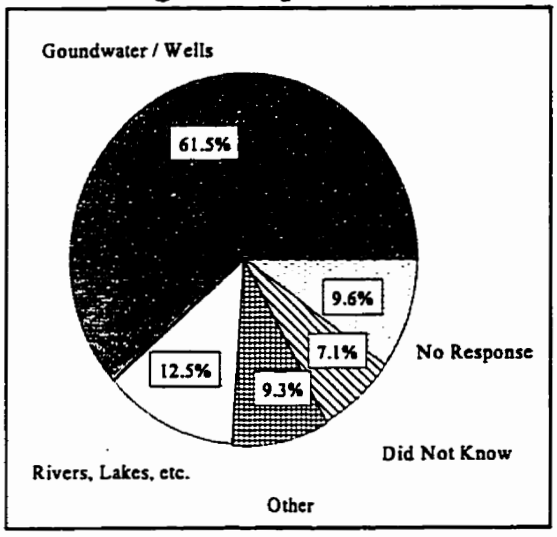
% of people who let the water run in order to let it get cold for drinking	31.8%
Who did not	67.1%
No Response\ N/A	01.1%
% of people with their downspouts connected beneath the ground	12.5%
Who did not	82.1%
No Response	05.4 %
Average No. of times per week that people water lawn in the summer	1.50/wk

Table 4.7: Respondent's water conservation behaviour. n=280

Table 4.6 indicates that the installation of low flow toilets and showerheads is less than the rest of Ontario, especially for toilets. This would seem to point to a possible opportunity for future conservation programs, aimed at both the public and developers. In stark opposition to this was the respondent behaviour in table 4.7. The high percentage of respondents that have removed their downspouts from beneath the ground and therefore out of the storm drains and combined sewers, reflect a successful downspout removal program run in the summer a few years ago by the Town of Orangeville. The introduction of alternative technology, such as water filters, is a possible explanation for the high level people that do not run their water to get it cold. And the institution of alternate days for lawn watering seems to have made people aware of the need for water conservation in the summer.

4.3 Perceptions and Knowledge of the Local Environment

4.3.1 Origin of Tap Water



It is encouraging to see that over 60% of the respondents recognized that their drinking water originated from groundwater sources. The ground water is pumped to the Island Lake Reservoir before entering the municipal system. The relatively high percentage of people that are familiar with their drinking water situation will make it easier for future programs that link peoples actions to potential ground water contamination.

Figure 4.7: Answers that respondents gave when asked where their tap water came from. n=280. N.R. = 27
Other = piped in from Georgian Bay etc.

4.3.2 Knowledge of Local Geography

Which watershed are you in?

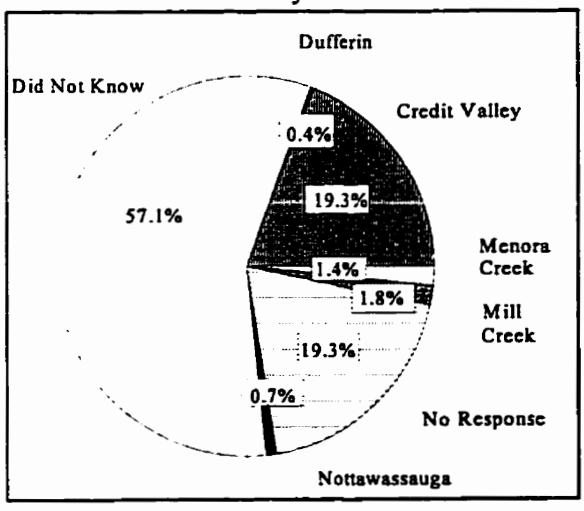


Figure 4.8: Responses by percentage to the question "Do you know which watershed your property is in? n=280, N.R.=54

Which Conservation Authority are you in?

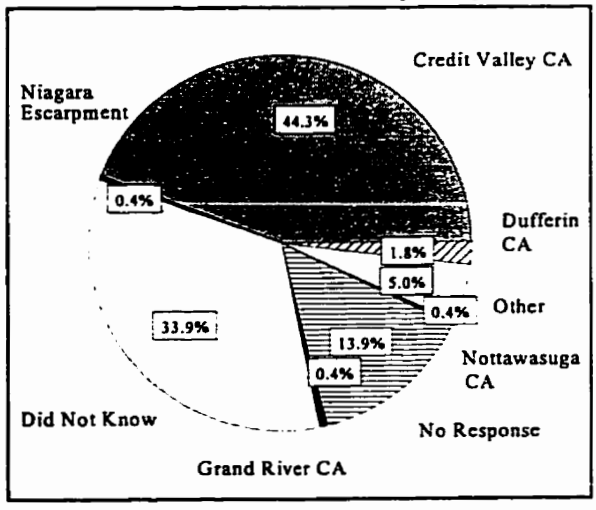


Figure 4.9: Responses by percentage to the question "Which conservation authority 's jurisdiction covers your area?' n=280.N.R.=38

The results of these two questions are grouped together because conservation authorities function on a watershed bases and it therefore would be interesting to see if people recognize this connection. As can be seen from the results this is not the case. Forty - four percent of the respondents named the CVC as having jurisdiction in their area but only 19% recognized that they were located in the Credit Valley watershed. Just as disturbing is that the fact the number of people that cited any of the Credit River's subwatersheds is not enough to account for the difference. Further, 57% of the people did not know which watershed they were in. Clearly there is room to educate the public as to what watersheds are and the CVC's relationship to them.

Knowledge of Local Creeks and Rivers

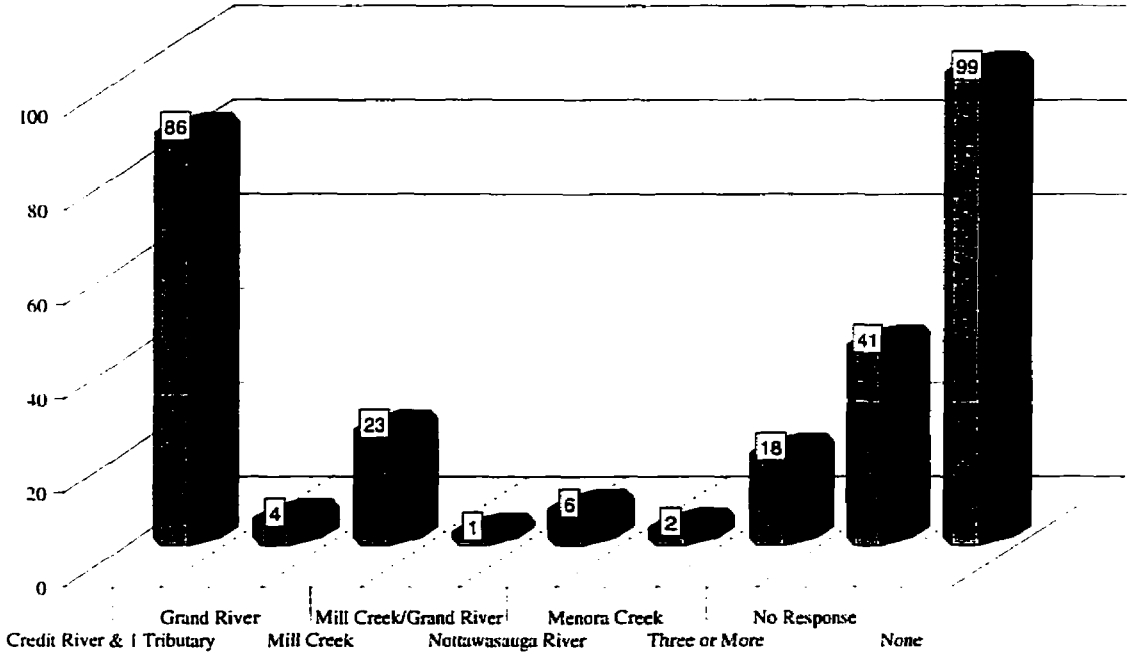


Figure 4.10: Responses (in number of people) to the question: "Which creeks/rivers are you familiar with that flow through Orangeville?"n=280

The purpose of this question was to uncover the respondents' familiarity with their local surroundings. As can be seen from Figure 4.10, eighty - six people named the Credit River or the Credit River and one of its tributaries (Mencra & Mill Creeks). Mill Creek (or Mill Creek with the Grand River accounted for twenty - four people and two more people cited Menora Creek. In total, there were one-hundred and eighteen people who correctly named at least one of the rivers or creeks that fall within the boundaries of Orangeville. Comparing this to the ninety-nine people who could not name any river/creeks and the forty-one who did not respond, it can be concluded that less than half the population surveyed were well acquainted with their local riverine geography.

4.3.3 Knowledge and Perceptions of Buffers

Buffers - Knowledge	Not at all improved	A little Improved	A lot improved	No Response	Totals
Reduce Erosion	24 (8.6%)	82 (29.3%)	114 (40.7%)	60 (21.4%)	280 (100%)
Reduce Flooding	42 (15%)	86 (30.7%)	87 (31.1%)	65 (23.2%)	280 (100%)
Improve Water Quality	28 (10%)	85 (30.4%)	104 (37.1%)	63 (22.5%)	280 (100%)
Provide Wildlife Habitat	14 (5%)	73 (26.1%)	134 (47.9%)	59 (21.1%)	280 (100%)
Enhance Aesthetics	19 (6.8%)	70 (25%)	126 (45%)	65 (23.2%)	280 (100%)
Provide Recreational Opportunities	49 (17.5%)	76 (27.1%)	89 (31.8%)	66 (23.6%)	280 (100%)
Reduce Water Temperature	46 (16.4%)	87 (31.1%)	73 (26.1%)	74 (26.4%)	280 (100%)
Reduce External Impacts	34 (12.1%)	84 (30.0%)	92 (32.9%)	70 (25.0%)	280 (100%)

Table 4.8: Responses to the perceived benefits that buffers provide for river and creek systems. The scale used was: 1 = not at all (improvement), 2 = A Little (improvement), and 3 = A Lot (improvement).

The purpose of this question was to determine what the respondents felt the benefits of stream buffers were? The top three answers (from above) were the provision of wildlife habitat (47.9%), enhancement of the local aesthetics (45%), and the mitigation of erosion (40.7%). Also, it is worth noting the high levels of people who could not see any benefit that buffers provided for some categories, such as the reduction of water temperature. For many of the people this was their introduction to the concept of buffer strips to protect a river or creek, and as a result there was considerable confusion and resistance to this question, as is evident from the high levels of *no responses*. These results suggest that a lot of work in educating the public about the value of buffers should be done before there is any attempt to establish them.

4.3.4 Presence of Wildlife in the Urban Environment

The majority of the respondents find wildlife to be an asset to the urban areas (75%). A few people found wildlife to be problem (17.5%) and an even smaller proportion of the residents refused to answer the question (7.5%). When asked to give a reason why they find wildlife to be an asset, 17.9% stated that it was because they found wildlife aesthetically pleasing and 9.6% said it provided an educational experience. However, a large percentage (52.1%) were unable to provide a reason for finding that wildlife was an asset. In a paper prepared by the Canadian Wildlife Service (1993), 86.25 of the Canadian Population indicated that they felt it was very important or fairly important to maintain abundant wildlife. It would appear that the Town of Orangeville generally mirrors the national trend in their concern for maintaining wildlife.

4.3.5 Environmental Emergency

When asked the question " Who would you contact in the event of an environmental emergency?" (A oil spill was offered as an example) a disturbing 21% of the respondents did not answer the question. Of the people that did answer the question 28.2% would call the police, 21.1% would contact City Hall, and 8.2% would call the fire department. These results suggest two things; the public does not perceive any of the designated environmental agencies as responsible for their local environs; and that City Hall would be the best candidate to contact and coordinate any clean up effort (since it really does not fall under police jurisdiction).

4.4 Motivation and Participation

4.4.1 Motivations

Activities that people do centred around the Credit River

Activities people do around the Credit River	Canoeing	Fishing	Walking/ Running/ Hiking	Picnicking	Cross Country Skiing	Bird Watching/ Nature Observing	Swimming	Snowmobiling	Other	Do Not Use at all	Res
Percentage of people in the survey that did that activity	11.80%	20.00%	46.10%	23.90%	6.40%	22.50%	14.30%	2.50%	4.60%	33.60%	7.

Table 4.9: Percentage of people who cited each activity that they engaged in that is centred around the Credit River and its tributaries. People could choose all the activities that they did. N= 280. N.R.=3. except 'snowmobiling' N.R.=7 and 'other' N.R.=13

When the participants in the survey were asked what activities they use the Credit River and its tributaries for, the above results were received. It would appear that the passive recreation categories (i.e., walking, hiking, bird watching, etc) comprise the bulk of the activities that people engage in. The relatively high percentage of people who do not engage in any activity

or who did not respond is perhaps a reflection of a commuter community that has little excess time to make use of the local surroundings. The participation rates in all the other activities totalled is a good base to build on to further educate people about their responsibility to future generations to conserve the environmental resources associated with the Credit River. Further, it may indicate a basis of support for greenway initiatives in an urban setting.

Complimenting these high activity rates on public property is the apparent transference (at least in desire) of the love of nature to their home surroundings. For example, 60% of the respondents have bird feeders on their property, and it can be assumed that they take the time and effort to stock them with feed. In addition, almost three-quarter (74.6%) of the respondents were interested in attracting more birds and butterflies to their home. When people were asked directly if they were interested in making their property more environmentally friendly the overwhelming response was yes (88.2%). Yet, when asked if they would devote a day to a symposium on land stewardship and the environment only 35.4% sais that they would attend. Discussions with the participants indicated that the length of time (a whole day) was too long, that they would be more inclined to attend something on a week night, for a shorter period of time. The symposium format could also have been a possible barrier, as it might have been seen as being to much like a class room situation.

Respondents Motivations for establishing Buffers

Buffers - Motivations	Maintain Property Values	Property rights are maintained	Restrictions on Trespassing	Increased Visual Aesthetics	Reduce Flooding	Reduce Erosion	Improve Water Quality	Increase Wildlife Habitat	Provide Recreational Opportunities	Improve Fish Habitat	Other	Would Not Participate
Percentage of people in the survey that cited each reason for establishing buffers	28.90%	19.30%	15.00%	39.60%	25.70%	31.80%	43.90%	44.60%	29.30%	35.00%	3.20%	15.00%

Table 4.10: Percentage of respondents that cited each reason that would motivate them to participate in establishing a neighbourhood buffer system along their creeks and rivers. People could choose more than one reason. N=260, N.R.=35 except 'would not participate' N.R.= 34 and 'reduce erosion' N.R.= 36.

When the participants were asked "If your neighbours on the creek agreed to establish a buffer zone, what would motivate you to participate?" the above results were obtained. Table 4.10 shows that the three strongest motivators were improved water quality (43.9%), increased wildlife habitat (44.6%), and increased visual aesthetics (39.6%) respectively. These results point to the key feature that should be marketed to the people of Orangeville, with an emphasis on the mutual benefits that would be derived from a greenway system

Interestingly, the preservation of property rights (19.3%) and the restriction of trespassing (15.1%) were the two lowest categories of those that would participate. The greenways literature has suggested that these two reason along with access concerns are usually the biggest stumbling blocks to their establishment (see landowner attitude section). These result would suggest that it is a minority of the population who are responsible for stopping the creation of greenways, and that if sufficient public pressure can be focused on these individuals they may change there mind.

4.4.3 Participation

A full 63.3% of the respondents either were not involved in any community organization or did not respond to the question (57.9% and 5.4%, respectively). These figures support the common belief that many community groups seem to be declining in popularity. Community groups that were popular with the remaining 37.7% were those affiliated with the church, (5.0%), cubs, scouts, guides etc. (5.4%) and unspecified nature groups (4.3%). These figures suggest a potential problem in recruiting people to participate in stewardship initiatives.

When the scope was narrowed to find out what environmental organizations people were members of (nearly 70% of those surveyed were not) then no one organization or group of organizations dominated. International groups such as the World Wildlife Federation and Greenpeace garnered 7.5% of the responses. This is not encouraging for stewardship because typically the only requirement for participation is a cash donation without any voluntary time associated with membership. (full results in Appendix E, question 18)

When asked the question " If you were to join an environmental organization what type would it be?", 20% of the respondents indicated a preference for a local organization, while another 12.9% would choose to join a hunting/fishing group, which also tend to be local. The remaining 37.1% were distributed equally amongst the remaining categories (see Appendix E), and only 30% of those surveyed did not wish to participate in any type of environmental venture. With close to two-thirds of the people surveyed wanting to participate in environmental organizations, it would appear that there is a foundation for new

initiatives. And since 33.9% of the people felt that local organizations were the most effective in protecting the environment, it follows that this should be the focus (question 20).

4.5 Mill Creek

The purpose of this set of questions was to obtain a finer focus on the resident's views of one of their local urban tributaries, Mill Creek. Only people in close proximity, (streets immediately parallel to the creek or once removed) were interviewed. There were four questions asked of the participants:

1) **Enjoyment derived from proximity**

No Enjoyment	A Little Enjoyment	A Lot of Enjoyment	No Response	Totals
54 (35.3%)	35 (22.9%)	25 (16.3%)	39 (25.5%)	153 (100%)

Table 4.11: Responses to the question, "Do you derive any personal enjoyment/satisfaction from living close to Mill Creek?".

2) **Enhancement of properties value**

Not at All	Somewhat	A Lot	No Response	Totals
78 (50.9%)	22 (14.5%)	12 (7.8%)	41 (26.8%)	153 (100%)

Table 4.12: Responses to the question "Do you feel that your property's proximity to Mill Creek enhances its value?".

3) **Rating of the environmental health of Mill Creek**

Very Poor	Poor	Good	Very Good	Excellent	No Response	Totals
5 (3.2%)	35 (22.9%)	39 (25.5%)	7 (4.6%)	2 (1.3%)	65 (42.5%)	153 (100%)

Table 4.13: Responses to the question, "How would rate the environmental state/health of Mill Creek?

4) **Propensity to volunteer**

Yes	No	No Response	Totals
70 (46.1%)	41(26.6%)	42 (27.3%)	153 (100%)

Table 4.14: Responses to the question, "If your local community was organizing either a stream bank tree planting project or a clean up effort, would you volunteer to participate?"

N = 153 for all questions

The responses to the first two questions were not encouraging for the future of Mill Creek's environmental well being. People apparently do not derive enjoyment from living in close proximity to the creek, with only 39.3% of the respondents saying they derived either a little or a lot of enjoyment from living close to the creek. They also do not feel that being in close proximity to the creek enhances their property value (only 22.3% said it did enhance property values). This points to the necessity for more work to be done in uncovering what it is exactly that people would like to change in order that they might place a greater value on this resource.

Most people felt that the streams health was in the poor (22.9%) to good (25.5%) range. This means that 48% of the people perceive the streams health as being less than optimal. A further 42.5% declined to answer. These poor results could in part be explained by the low value that the respondents placed upon Mill Creek, as evidenced from the answers to the first two questions.

The results to the last question were encouraging. A full 46.1% of the people surveyed said that they would volunteer time to improve Mill Creeks appearance, as opposed to a 26.% who would not volunteer any of their time. Yet, this figure must be treated with some scepticism due to the high percentage of people that did not provide responds for all four questions. The general feeling that comes out of these results is that the people of Orangeville place a very low value on Mill Creek.

4.6 Looking for two Statistical Trends suggested by the Literature.

At the beginning of this chapter, Arcury (1990) and Scott and Willis (1994) suggested several trends that were statistically significant. The data collected in the survey allows for testing of two of these trends; (1) the negative relationship between a persons age and their environmental attitude; and (2) the positive relationship between a persons level of education and their environmental attitudes and actions.

To confirm or deny the negative relationship between a persons age and their environmental attitudes and behaviour the data from the Mill Creek section of the survey was used. The reason this was used, was because the responses to the three questions are ordinal level data. The more informative level of data of these questions allows for the stronger Spearman's Rank correlation coefficient test to be performed. Spearman's *rho* can vary between +1 and -1, with a value of 1 representing a perfectly positive or negative correlation, depending upon the sign. The smaller the correlation coefficient rho, the less likely it is to differ from zero as a result of chance (FitzSimons, 1996). The following are the three questions:

1) Do you derive any personal enjoyment /satisfaction form living close to Mill Creek?
   1 (none) 2 (a little) 3 (a lot)
2) Do you feel that your property's proximity to Mill Creek enhances its value?
   1 (Not at all) 2 (somewhat) 3 (a lot)
3) How would you rate the state/health of Mill Creek?
   1 (Very Poor) 2 (poor) 3(good) 4(very good) 5(excellent)

	Question 1	Question 2	Question 3
rho value	.014	-.010	-.034

Table 4.13: Results of Spearman Rank Correlation between Age and the above three questions.

The analysis indicates an extremely weak, but statistically significant relationship between age and the three questions. As expected the results from question 2 and 3 indicated the anticipated negative relationship. Question 1 did not, and shows a slightly positive relationship. This weak relationship is consistent with the results uncover in the semi-structured interviews (which will be discussed shortly) that indicated that many retired people did in fact have an interest in the environment. This may be because a higher percentage of the people that engage in passive recreational activities that are older.

In order to confirm or deny the positive relationship between education and environmental attitudes and perceptions, six questions from the survey were used. Two of the questions represented people's behaviour, two represented people's perceptions, one represented their knowledge and one represented their propensity to volunteer. The questions all required responses at the nominal level of data. Pearson's Chi-Square (a non-parametric test) was run with the level of education and each of these questions. The results of the chi-squared test were used to determine lambda which is a proportional reduction in error measure of association. Lambda reflects the reduction in error when values of the independent variable (education) are used to predict values of the dependent variable (the six questions). A value of 1 means that the independent variable perfectly predicts the dependent variable. A value

of 0 means that the independent variable is no help in predicting the dependent variable. The following are the six questions:

1) Do you compost your garbage?
2) Do you let the water run in order to get it cold for drinking?
3) Would you be interested in attracting more birds/butterflies to your home?
4) Do you feel the presents of wildlife is a problem or an asset in urban areas?
5) Which Conservation Authority's jurisdiction covers your area?
6) Would you be interested in attending an all day workshop/symposium on private land stewardship/environmental issues?

The following are the Lambda results arising from the Chi-Square test between education and each of the questions:

Questions Asked / Lambda Results	Composted their Garbage	Let Water Run to Get Cold	Wanted to Attract more Birds and Butterflies	Feel that Wildlife is a Problem	Knew which CA they were in.	Willing t attend an Day Symposiu
Education	.00746	.00000	.00000	.00000	.08943	.00000

Table 4.14: Result of the Chi-Square test between education and each of the six questions.

The results indicate that there is little or no positive relationship between a person's education level and their concern for the environment. This should not be interpreted to mean that education (as a whole) does not have an influence on peoples environmental behaviour, just that from the data collected it is not possible to discern a difference in people's action toward the environment bases upon their level of education. It would seem to indicate that a persons level of awareness is not dependent upon their level of education, only that they are educated about the environment.

4.7 Summary of Attributes from the Orangeville Environmental Survey

The preceding survey data section had been summarized into the following twelve attributes.

1) The Town of Orangeville is a relatively young (< 45), family oriented population that is increasingly becoming more urbanized.

2) There is a negative relationship between a person's age and their level of environmental concern; that is to say younger people are more environmentally concerned.

3) There is a positive relationship between a person's level of education and their level of environmental concern.

4) People want to do the right thing and want to be *seen* doing the right thing as evidenced by the results from the recycling questions.

5) There appears to be a relatively high percentage of the population that has enough of an interest in the environment that they will volunteer for future initiatives.

6) There is a slight majority of people that are more concerned with improving water quality, increasing wildlife habitat and visual aesthetics, than there are people concerned with property rights and trespassing issues.

7) Despite a stated desire to be environmentally responsible there appears to be limited evidence of this judging from people's actions. Examples that suggests this were the high percentage of pesticides and fertilizers used, the high percentage of people that salt their driveways, and the low percentage of people that have installed low flow water devises.

8) The public does not seem to understand the concept of a watershed. This lack of knowledge extends to the concept of buffers too.

9) The public shows confusion as to the CVC's jurisdiction and function.

10) Passive recreation activities are more prevalent than active recreational activities are.

11) Well designed Social Marketing programs work, as is evidenced by the percentage of people that recycled, responsibly disposed of hazardous waste, and composted.

12) People indicated a preference for local environmental organizations.

4.8 Summary of Attributes from the Semi-Structured Interviews

The following is a summary of the attributes that emerged from the 12 semi-structured interviews that were conducted in February 1997. There are 14 attributes in all, each reflecting those perceptions that were reoccurring amongst the interviewees or reinforced attributes that appeared from the survey data. They have been generally grouped according to the categories that the survey used, namely; population characteristics; peoples environmental behaviour on their property, motivations and perceptions, and information on Mill Creek.

4.7.1 Population Characteristics

1) There appear to be a large percentage of households that have at least one member of the family commuting to Toronto, and of these families many are new to the town. This has two effects; one, it means that approximately 2 - 3 hours per day are taken up with commuting which cuts into free time; and two, there is a large number of people that are only vaguely acquainted with the local geography.

2) It would appear that many of the retired people that have lived there most of their lives have different activity and behavioural profiles than the rest of the population. For example, they tend to participate more in social organizations, and many have respect for the environment that was usually cultivated from having worked on the farm at some point in their life. This contrasts the survey results and literature. Many of these people also have local knowledge about environmentally degraded areas.

3) Another significant percentage of the population is comprised of young families, who participate in many youth related activities.

4.7.2 Environmental Behaviour on their Property

4) There was a high level of awareness about conserving water during the summer months, especially when it concerned lawn watering. It would appear that this concern is only partially transferred to the conservation of water within the residence. People appeared to have very little concept of their individual consumption. Conservation of water appeared to be restricted to the use of a low flow shower head and Brita water filter.

5) People want to be seen as doing the right thing as was evident by the responses received when they were asked if they recycle. The majority of the interviewees became very enthusiastic in there responses and could be described as anxious to demonstrate their participation in the recycling program. This was also the case when asked how they disposed of hazardous products.

6) Many people were split as to whether they wanted to encourage wildlife on their property. They wanted to attract birds and squirrels but often were conscious of encouraging skunks, raccoons and other animals often considered pests.

4.8.3 Perceptions and Motivations

7) The concept of a watershed is not well known by most of the interviewees. They understood it when it was explained, but it would be doubtful that they would be able to apply the concept in practice if they were asked to.

8) The CVC is seen as having a high profile both with the running of the Island Lake Conservation Area and in the local political scene. In discussions with people concerning the CVC, the two primary functions mentioned other than the two above were research and flood plain management (i.e. regulatory).

9) With regard to the buffer questions, many of the people did not feel qualified to answer the question or offer their opinion. Again this is probably a result of a lack of knowledge about the buffer concept.

10) There appeared to be a weak sense amongst the people interviewed that their local resources are shared and finite. This means that there may be some leeway with regard to issues of public access and private ownership.

11) Most people felt that a day-long seminar was too long. Time commitment was a reoccurring theme. People continually stated that they wanted programs to be of a shorter rather than longer duration, organized, hands on if possible and interesting.

12) Many people felt that if they were provided with affordable alternatives that they would use them. Examples that were given were Stoop & Scoop bags in the parks, cheaper environmentally friendly products like soaps, and tax credit or rebate programs for programs such as the installation of low flow toilets.

4.7.4 Mill Creek

13) There was a very low opinion of Mill Creek by those interviewed. They did not see it as a valuable asset, but more as a degraded eye sore.

14) Few people recognized that the upper reaches of Mill Creek contribute significantly to groundwater recharge and therefore to their drinking water.

4.9 Summary of the CVC, November 23, 1994 Open House.

The following is an overview of some of the key statements made by the approximately 75 people who attended the November 23, 1994 open house for the subwatershed No. 19 study. These points have been transcribed from CVC records:

- the water resources of Subwatershed No. 19 are primarily used for recreation and drinking water;
- virtually all responses stated that the trail systems were an important recreational use of the Credit River tributaries and its valley;
- other significant uses of the tributaries and associated valleys included bird watching, nature appreciation, park usage for family outings and golf;
- Island Lake and Monora Conservation Area were noted as the most popular recreational areas, however, many other locations within the valleylands were noted on the responses;
- a majority of the individuals considered the protection, enhancement or restoration of the terrestrial features to be very important; most saw reasonable uses being:
  - habitats suitable for native plant and animal communities;
  - opportunities for passive (e.g., walking trails) usage by humans;

- in general, the environmental health of the watershed was perceived to be good (80%) or fair (20%). Everybody saw environmental issues as being important (25%) or very important (75%);

- half of the individuals thought that the environmental health of the watershed had not changed over the last 10 yrs, while the other half were split (i.e., improved or worsened); and

- a wide variety of environmental issues were noted, including:
  - protection of recharge areas;
  - protection of drinking water sources;
  - water quality;
  - balancing environmental issues with growth pressures;
  - gravel pits;
  - the compatibility of drinking water with sewage;
  - protection of wildlife, wetlands; and
  - use of prime land (environmental & agricultural) for urban growth

  (Subwatershed No. 19 Technical Document pg. 4.5)

4.10 Current Organizational Environment in Credit Valley Conservation

The attributes presented in the next two sections are summarized from several informal discussions with CVC staff. Six broad questions were asked to be answered in a more formal way to focus and clarify the attributes that emerged from the discussions. The results of the questions are transcribed and presented in Appendix C.

1) The delivery of a comprehensive stewardship program is a new initiative for Credit Valley Conservation.

2) Conservation Authority's budgets have been substantially reduced, which directly effects how they will administer and deliver their programs. We must explore methods of offsetting these reductions through more creative delivery methods and broadening our funding base.

3) Structurally and functionally the CVC is in a state of transition.

4) Currently staff is responsible for the entire watershed accept for the planners who are organized by municipality. There are not any community outreach staff.

4.11 Summary of Attributes from Discussions with the CVC Staff and Allen Young, Town of Orangeville

1) Environmental issues are complex and a correspondingly complex legislative response has evolved as a result. We (the CVC) must create a stewardship program that brings the environment and the people closer together.

2) In order to be successful in both reaching the people and in protecting the environment we must market ourselves better.

3) The CVC favours demonstration projects, hands on activities, and visual displays as effective ways of reaching the public. Keep messages simple and specific, and show tangible benefits.

4) Must continue and expand our partnership relationships and make them better defined. i.e. fund raising vs resource contributor vs project volunteers.

5) Should explore the possibilities of training/utilizing people outside the CVC to expand our resources. i.e. high school geography and science teachers, Master Stewardship programs.

6) Must become more proactive rather than reactive and opportunistic in our approach to the environment.

7) Public must become more involved in determining prioritization, organization, funding, and deliver of projects and programs. Must incorporate the public's measures of success.

8) Expected that the population of Orangeville's knowledge levels were comparable to, or better, than other similar towns in Ontario.

9) Length of time and scheduling are both issues that the CVC recognizes as being crucial in the success of an event.

10) CVC staff needs guidance and training as to how best to present to the public, most have been trained in the sciences.

4.12 Categorization of Data into Themes

The process of categorizing and grouping the information from the four data sources into the consolidated matrix of themes began by picking an attribute from the summary pages and separating it from the rest. Another item was then picked and placed with the first item if it was related, or placed in another separate location if it was not related. This process was repeated until every item in the initial attributes had been handled at least once. The attributes fell into three theme categories; population characteristics; environmental behaviour and local knowledge; and perceptions and motivations. The attributes were grouped into themes based upon the following six considerations besides their statistical relevance (stats):

1) Consideration of Words (W): The actual words used and their meaning. Also the degree of similarity among responses;

2) Consideration of Context (C): Participant(s) responses that are triggered by a stimulus. i.e. a question asked by the researcher;

3) Consideration of the Frequency or Extensiveness of Comments (F): Some topics are discussed by more participants (extensiveness) and some comments are made more often than others (frequency);

4) Consideration of Intensity of Comments (I): Participant(s) talk about a topic with a special intensity or depth of feeling. Examples of this are a person's word choice, tone, talking speed, and word emphasis;

5) Consideration of the Specificity of the Responses (S): Responses that are specific and based on experiences should be given more weight than responses that are vague and impersonal;

6) Find the Big Ideas (B): Big ideas emerge from an accumulation of evidence, i.e. a multitude of comments and details that cut across the entire discussion.

(Kruger, 1994:149)

Each dot next to the attributes in the consolidated matrix of themes (Figure 4.12) has one or more of the above criteria associated with it.

4.13 Consolidated Matrix of Themes

No.	Consolidated Themes	Cross Verification				Criteria	Totals
		Survey	Interviews	Open House	Discussions with CVC		
Population Characteristics							
1	A Large percentage of households have at least one commuter		•		•	W & F	2
2	A Large percentage of the population is comprised of young families	•	•			F	2
3	There is generally a negative relationship between a person's age and their level of environmental concern.	•	• *(S)		•	I&S & Stats	3
Environmental Behaviour and Local Knowledge							
4	There is a positive relationship between a person's level of education and their level of environmental concern.	•			•	C & Stats	2
5	There is evidence that people are partially disconnected from their local environment. This is expected to continue to increase with urbanization.	•	•		½ •	S & B	2.5
6	People are not familiar with the concept of a watershed and how it relates to them.	•	•		•	W & C	3
7	People generally were not familiar with the concept of a buffer.	•	•			W & C	2
8	Levels of environmental knowledge are comparable to the rest of Ontario's and Canada's	•			•	Stats & S	2
9	There is a significant number of people that are concerned with wildlife habitat, water quality and visual aesthetics.	•	*•	•		W & F	2.5

No.	Consolidated Themes Environmental Behaviour con't	Cross Verification				Criteria	Totals
		Survey	Interviews	Open House	Discussions with CVC		
10	People want to be seen doing the right thing.	•	•		•	F & I	3
11	If people are provided with alternatives to past behaviours there is an increased chance they will use them.	•			•	C & S	2
Perceptions and Motivations							
12	The general environmental health of the Credit River watershed is seen as fair to good, with little change over the last 10 years.	•		•		S & Stats	2
13	Mill Creek is not perceived quite as highly as the Credit River in terms of environmental health.	•	•		½ •	S & Stats	2.5
14	There is a low recognition of Mill Creek's function in terms of recharge and filtering for drinking water.	•	•	*•		C & B	3
15	Greenways are recognized as a method of bringing people closer to their local environment.	•	•	•	•	C & S & B	4
16	There appears to be a weak recognition that natural resources are shared and finite.		•	•		B	2
17	CVC is seen in association with the Island Lake Reservoir, but not as the main authority in the conservation of water.	•	•		½ •	C & B	2.5
18	People indicated a preference to join local environmental organizations	•	•	½ •		S & Stats	2.5

No.	Consolidated Themes Perceptions and Motivations con't	Cross Verification				Criteria	Totals
		Survey	Interviews	Open House	Discussions with CVC		
19	Most people felt that an all day seminar was too long.	•	•		•	Stats & I & S	3
20	People indicated that training sessions should be organized, hands on and interesting.		•		•	F & S	2
21	Interest can be maintained by involving people from the onset of a program/project, i.e. assisting in the planning and organization.		•		•	C & S	2

* indicates contradictory views (see discussion chapter 5 for further reference)

Table 4.15: Consolidated Table of Themes

A review of the themes suggests the who, what, and why of any future course of action that may be undertaken. The population information reveals who a stewardship program should target. The attributes in the environmental behaviour and local knowledge theme suggest the type of education program that would be effective. For example a review of attributes 5,6,7,10, and 11 suggest that a hands on approach would be well received by the citizens of the Town of Orangeville. The attributes under the perceptions and motivations theme serve two purposes, they uncover people's motivations (the why) and they point toward people's perceptions that may need to be corrected.

Chapter 5.0: Discussion of Emerging Themes

In this chapter, the emerging themes presented in Table 4.15, are discussed and summarized. The conclusions that are reached will, where possible, be tied to the theory presented in chapter 2. Together, these will lead to the formation of a Community Environmental Development stewardship model for an urban setting. The sections in this chapter correspond to the first four objectives of this research as outlined in chapter one.

5.1 Current Setting

This section puts into context the current conditions in both of the two groups of people that the study involves, namely the population characteristics of the Town of Orangeville and the structural situation in the Credit Valley Conservation Authority. Throughout the discussion and recommendations the following facts will underlie and influence the conclusions reached. Most of the following information has already been stated previously but due to its importance to the contextual setting it will be presented again.

The Town of Orangeville is growing at an unprecedented rate, mostly due to the influence of the ever expanding Greater Toronto Area (GTA). Although there is not a good estimate of the percentage of the local population that commutes daily to the GTA for employment, the general consensus among Town officials and CVC staff is that this number is proportionally high when compared to people who are locally employed. The 1995 census statistics on where a person is geographically employed support this (Town of Orangeville, 1996). Also, statistics from the

Town and the survey indicate that the majority of the population is 45 years old or less, and comprised of young families that total 4 to 5 people.

The present Conservative government's restructuring has meant that Ontario's Conservation Authorities have been scaled back in terms of jurisdiction and funding. Credit Valley Conservation is not an exception and in its most recent business plan it supports stewardship programs as one method of counteracting government cutbacks. There are two philosophies behind initiating a broad based stewardship program at this time. One, it is a method for continuing the current programs that the CVC undertakes. The programs may not be exactly the same but will strive to accomplish the same or similar objectives. Further, stewardship programs are a way to get the public involved, which if instituted correctly, can expand the human resource and funding bases that senior levels of government have withdrawn. The second philosophy that is recognized, is that stewardship can change the public's perception of conservation authorities as managers of flood plains to necessary protectors and managers of water resources.

As with most change, old methods and patterns are hard to shake. The current structure within the CVC is in a state of transition and is still presently aligned along scientific lines; a marine and terrestrial biologist, a hydro-geologist, an engineer, etc. For most of the staff the entire watershed is their geographic boundary, only the five planners are oriented by smaller municipally based territories. In response to the cutbacks there have emerged teams to deal with the changes proposed in the business plans, as in the team for the implementation of stewardship.

The current situation within the CVC could be characterized as *grappling* with its structure and function to ensure its future and fulfilling its mandate.

5.2 Behaviour, Local Knowledge and Perceptions

5.2.1 Behaviour and Local Knowledge

When people were asked to name the rivers and creeks that were in the town boundaries, less than half those surveyed could do so, and of these, the majority could only name the Credit River. Recognition of the Credit River tributaries in Orangeville was very poor. Further, a full 57% of the people did not know what watershed they were in and only 44.3% could name the conservation authority whose jurisdiction they were in (despite CVC being written on the surveyor's name tag). Clearly, Rees (1995) was correct in his observation that a distance has developed, both psychologically and spatially, from the land that sustains us. If one considers that the average residency time at a person's current address was just over seven years, many of the poor results reported above can be attributed to recent immigration to the community. There can be little doubt that as Orangeville becomes more urbanized, the insular lifestyle that accompanies development will serve to further isolate people from the local environment. Until recently, people did not want to know where their garbage went, just as long as it no longer presented a problem to them. Regardless of the reason, the solution to people being disconnected from their local environment is to bring them in contact (frequently if possible) with it so that they will begin to associate nature with their quality of life.

There was evidence in the results of the survey and especially the interviews to support Scott an Willets (1994) findings, that people have learned the language of environmentalism but have no simultaneously developed a commitment to it. The concepts of a watershed and of buffers wer generally not well understood by the interviewees and people surveyed. They often quipped 'Oh I know nothing about that' or 'I'm not qualified to answer that.' They were familiar with th terms but when asked to apply the concepts they were reluctant, which would seem to indicat only a superficial knowledge. Yet, in terms of environmental behaviour, the survey result supported by the discussions with the CVC, indicated that the people of Orangeville are typica for the rest of Ontario.

One of the encouraging attribute to emerge was that people had consideration for the amenitie within the community. The evidence to support this comes from the high percentage of peopl that wished to encourage greenways because they contributed to wildlife habitat and visua aesthetics, as well as from the large number of people that engages in passive recreationa activities around the Credit River. Recreational activities were a particularly strong attribute tha came out of the 1994 Open House. In section 2.4, 'Landowner Attitudes', evidence wa presented on several other studies that concluded that wildlife, scenery, and recreation wer slowly gaining status with economic considerations that a parcel of land could yield (Brunso et al, 1996; Birch, 1989; MacConnel and Archey, 1982). In terms of what this means to futur conservation effort in the Orangeville area, this can be seen as an initial base (albeit a slim one from which to build on in the future. A caution should be issued at this point, since in th interview, people often had second thoughts on attracting wildlife to their vicinity if it mean

attracting skunks, raccoons and other animals usually considered pests. Again, this seems to be a case of not realizing the full consequence of their actions and initially just wanting to be seen as being environmental friendly.

Information surrounding the results of the recycling questions, in conjunction with other questions contributed to the environmental behaviour theme. The first attribute was that people want to be seen as doing the right thing. During the interviews, one could not help but observe that people were eager to be seen recycling. This was also reflected in the 20% higher numbers received in the survey's recycling questions than were found in the rest of Ontario. This positive attitude speaks volumes to how successfully the recycling message presented in the 1980's social marketing campaigns has become an ethical part of today's society. Recycling is seen by the public as the right thing to do and they do not want to be seen as behaving otherwise (cognitive dissonance, section 2.6.2). If alternatives to people's past undesirable behaviour are made readily available, then this will increase the likelihood that the behaviour will change. Again, this is supported through the high percentage of people that recycle through-out Ontario, in large part because it is easy for them to do so with the blue box that was provided for them. Possible further evidence of this behaviour could be the higher than average number of people in Orangeville that dispose of their hazardous waste on the special days that are provided for at the local waste site. The CVC has also encountered this behaviour during landowner contact projects. Repeatedly, they have found that when they approach a person and explain what it is that they wish to change on a person's property, that more people have been willing to cooperate than there were that refused. Given a chance, and the opportunity, people will generally behave

in the desired way, if they think it is the correct thing to do and if it is relatively easy for them to change their past practices.

5.2.2 Perceptions and Motivations

When people were asked at the 1994 open house how they would rate the environmental health of the Credit River watershed, 80% said 'good' , and 20% said 'fair'. Mill Creek was not perceived quite as well, with only 25.5% seeing the environmental health as 'good' and 22.9% seeing it as 'poor'. Taken together, these observations suggest that there is a discrepancy between people's perceptions on a large scale and those on small scale. This phenomenon can be compared to the dilution factor in a solution; a few poor areas over a large watershed will have little effect on the perception of the whole, while a few poor areas in a smaller watershed can negatively influence people's perception of the entire creek. The sense of urgency that is usually the catalyst for change may in fact not be present for a large percentage of the population because they are taking a large scale perspective.

The above observation is supported by the next attribute; there appears to be a low recognition of Mill Creek's function in terms of recharge and filtering for drinking water. Although this was not one of the stronger attribute that came through in the research, there was enough evidence to suggest that the above statement has some merit. First, people in the survey did not recognize the tributaries that feed the Credit River in numbers that were statistically significant. This could lead one to the conclusion that the public generally does not associate the two entities as being part of one larger system. Couple these results with the fact that nearly 40% of those surveyed

did not know that their drinking water came from a ground water source and it suggests that there is a lot of work to be done to change the perception of Mill Creek and the other in-town tributaries. Mill Creek's headwaters are a significant recharge area for the local ground water supply. People must be made aware of the systems linkages to the Credit River, and their dependency on the recharge areas for drinking water, so that people will support the work being done to protect these areas. Fortunately, there is a core of individuals that do recognize these connections, as was evident from the transcripts of the 1994 open house. This will give the CVC a base of people with which to work for future programs.

It was suggested previously that people were beginning to value wildlife, and the visual aesthetics of a property rather than just seeing it for its development potential. There also appears to be a change in people's perceptions of natural resources as simply a commodity, to recognizing them as being finite and shared resources. The emergence of this attribute stems from the interview and the open house summary. During the interviews, people continually chose alternative reasons to the issues of trespassing and property rights when discussing the possibility of establishing buffers along their neighbourhood creek. This would seem to indicate recognition that the creeks are shared throughout the community. Access to the creeks was not discussed. Also, people expressed concern over future development's consumption of local natural areas, even though this was not related to any question on the survey. Again, this would seem to suggest that people recognize once these resources are gone, that they are lost for ever. The above findings are supported by the studies done by Brunson et al (1996) who found that people *may* only be influenced by concerns over their property rights. At best, there appears to be a

weak causal link, one that could be over come with a campaign aimed at changing the public's perception of the environment and ownership.

The strongest attribute to come out of all four data sources was that trails and greenways were recognized as being able to bring people closer to their local environment. The large number of people in the survey that engage in passive recreational activities; the responses given in the interviews; the repeated mentioning of recreational activities at the open house; and the recognition by the CVC of the disconnectedness that people feel from their environment, all point to trails and greenways as a method of being able to bring people closer to nature. Although this appears to be a simple conclusion, it was the overall positive view expressed throughout the research that made this encouraging. Generally, people are in favour of the establishment of corridors as long as the cost, in time and money, was bearable, and their rights were respected

In discussions throughout the research period with people in Orangeville, it became clear that the CVC is perceived differently depending upon what group you were talking to; developers saw them as being a regulatory body; the Town recognized them as being politically active; a large number of the public saw them in association with the Island Lake reservoir; and others were well acquainted with all of the CVC's activities, to name a few of the views. The point is that the message that the CVC is the leader in the protection of the environment as it relates to water resources (CVC, 1996) was not the dominant message that came through. Granted, each of the activities mentioned above is a function that helps in the conservation of water resources but the public's perception is fragmented and it does not see the CVC in the holistic way that i

is defined in its business plan. Name recognition and functional association are just two facets to consider in any marketing plan the CVC might undertake. These go a long way toward endorsing the credibility of field officers, making their job easier (McKenzie and Mohr, 1994).

5.2.3 Propensity to Participation and Volunteer

The public's stated preference to participate in local environmental organizations rather than other groups, presents an opportunity for the CVC to create a stewardship organization that people want. The high percentage of people that were willing to volunteer also points to opportunity. People indicated their preference as to the kind of activities that they would like to see. Most people felt that a day long seminar format was too long. They preferred the activities to be hands on if possible, organized, and interesting. Many of these preferences can be accomplished by involving the public from the onset of a project (also a stated preference). This may also help to have projects perceived as being endorsed by the community. These preferences have been supported in the theoretical writings of both social learning and societal guidance as presented in chapter two.

5.3 A Community Environmental Development Stewardship Model

The analysis of the attributes derived from the four data sources were grouped into three themes; (1) population characteristics, (2) environmental behaviour and local knowledge; and (3) perceptions and motivations. Each of these themes suggests their own course of action. The population characteristics suggest targeting a young audience (who). The second theme points to learning by doing as the most effective way to educate the public (what & how). And the third theme contributed two components to the model. First, the information on people's perceptions indicated a need for a marketing program to both educate and improve the public's views. Second, the information on people's motivations intimates an operational structural of self governance. Validity of all these actions was then sought out in the theoretical literature on public action. The model presented on the next page incorporates these actions and at the same time considers the current situation within the CVC.

Specifically, the model suggests an approach that could:

1) effect a paradigm shift in the community so the people recognize that their quality of life is dependent upon the environment around them;

2) allow the CVC to continue to administer its programs by using environmental activists and interested parties' resources;

3) use the energy and resources of currently interested parties to get the whole community involved;

4) incorporate public input and eventually governance;

5) expand funding sources over a larger group of people;

6) lessen the distance that has developed between people and the environment;

7) make the CVC recognized as the leader in water conservation efforts;

8) be flexible; and

9) uses the characteristics of age and education uncovered in the survey for implementing the model.

By making the model community based it addresses the public's desire to participate in local environmental organizations (attribute 18) as opposed to other possible stewardship delivery options. The following sections explain each component of the model (Figure 5.1) starting with social learning.

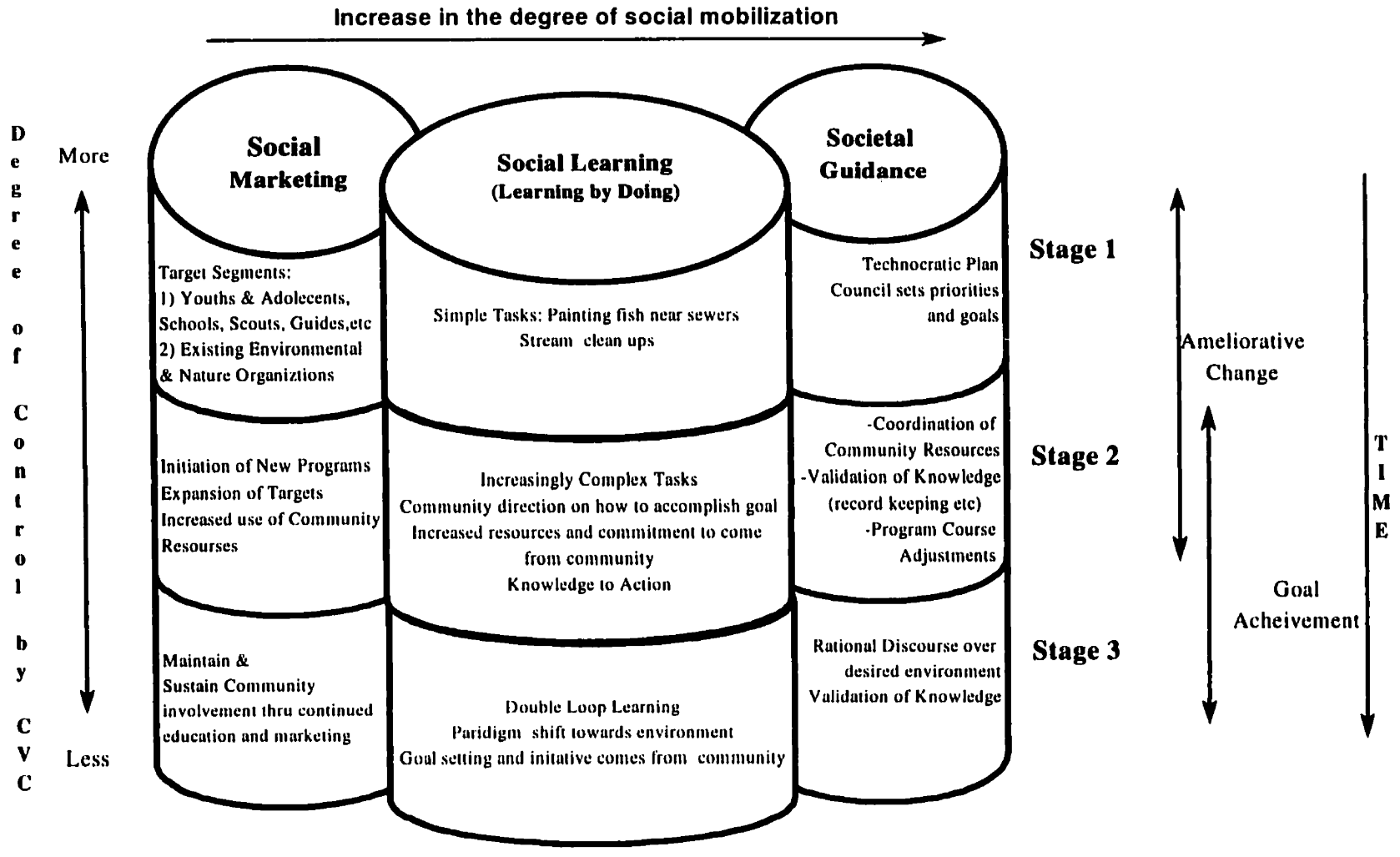


Figure 5.1: Delivery Model for a Community Environmental Development Model (C.EN.D.)

5.3.1 Social Learning in the C.EN.D. Model

Several attributes (problems) in the environmental behaviour and local knowledge theme suggest that a stewardship program organized around the premise of social learning would serve the community best. Social learning doctrine, "learning by doing" specifically addresses the attribute of *disconnectedness* (No.5), that was so prevalent on many different levels throughout the research, by creating opportunities for people to commune with nature in a positive and constructive way. Through people's involvement in programs they will see that it is their actions that affect positive change in the environment. Supported by one's peer or reference group, theories about the world acquire a definite structure and are difficult to change (Friedmann, 1987).

Attributes 6 and 7 on watersheds and buffers respectively, imply that Scott and Willets (1994) assertion that people had learned the language of environmental causes but not acquired the corresponding commitment exists and therefore needs to be addressed by the stewardship model. By adopting a *learning by doing* approach an individual(s) is given a chance to observe concepts that they may already be acquainted with in operation. Not only should this improve the public's understanding of watersheds and buffers but also improve their comprehension of the function and interconnectedness between the Credit River and its tributaries (attributes 12 &13 & 13). This informal learning situation should help to weave new practices into everyday social culture (Polanyi, 1966), so that double-loop learning can occur (Argysis et al, 1982), and therefore raising the levels of environmental knowledge of the citizens of Orangeville above the rest of Ontario (attribute 8)

The last main reason for proposing a social learning approach is because it is what the people asked for. Attribute 20 arose out of the public's desire for events to be hands on, and interesting, as opposed to seminars (attribute 19). Collaborations of people in small task oriented groups, can work on different projects and offer a variety for the public to chose from when deciding what to participate in (Caldwell et al, 1997; Friedmann, 1987). The group process should serve to foster and expand the developing environmental ethic.

If the theoretical premises discussed in chapter two (section 2.6.1) are examined, there are two notions that lend further support to the CVC's situation being an appropriate application for a social learning model; the use of change agents; and transformation on a local scale. Recall that *social learning may involve so-called change agents who encourage, guide and assist in the process of changing reality.* And that, *they are generally professionals or para-professionals who bring certain kinds of formal knowledge to the ongoing social practice of their "client group"* (Friedmann, 1987). This describes the envisioned relationship that the CVC would have with the public. That over time this relationship would become transactive and conducive to mutual learning. Also, recall that both Dewey (1946) and Mumford (1938) felt that the best scale for these types of interactions to occur on was at neighbourhood and village level, nested in the regional context. Again, we find contextual support for a social learning model in the literature.

The theoretical postulates just presented correlate well to attributes 10 and 11. Attribute 10 states that people wanted to be seen doing the right thing. Through interactive group learning

situations participants will get a chance to be seen *doing the right thing.* They (or their group) will usually have something tangible they have accomplished and can point to and they should be praised for their efforts. Further, by working with their local environment they may learn to appreciate it more and consequently alter their behaviour i.e. not littering (partially attribute 11).

5.3.2 Social Marketing in the C.EN.D. Model

The social marketing component of the model is what separates it from other stewardship programs. There are several reasons for it as one of the three components of a C.EN.D. model. The strongest of these is hinted at in Donald Gordon's (1994) words "*the most serious oversight in the experience of the Muskoka Heritage Foundation was not to organize itself around fundraising and membership*". The social marketing component of the model is there to help avoid these two pitfalls. This is not to say that the marketing component does not perform other functions that are also important, just that they will do little good if these two primary functions fail. Social learning theorists acknowledge that learning processes are not self perpetuating, that some mechanism is necessary for programs to continue (Chapter 2, section 2.6.1). For stewardship this means constantly recruiting new people to train and volunteer for environmental initiatives. This must be considered a priority, not an add on to other programs; the same can be said of fundraising. A good marketing program will aid immensely in these two areas since people are more likely to donate their resources and volunteer their time to what they perceive to be a worthy cause.

Several attributes in both the population characteristics and the motivation and perception themes suggest that a marketing component is necessary to be able to understand and create programs for the various targets within the Orangeville population. The negative relationship between age and environmental concern (attribute 3) points to the young as being an obvious target market, and to some extent the children's evolvement will cause their parents to become involved (attributes 1 & 2). But what about the other marginal, less obvious groups of people, how will they be reached? In part, the answer is that this is a community based program which uses existing environmental groups (attribute 9) as initial targets to spread the messages to other members within the community. The other way that the model will reach these people is through specific marketing programs aimed at modifying their behaviour. This is where the relationship between education and the environment (attribute 4) becomes useful; it provides a measure for determining the level of difficulty that a marketing strategy should be geared to.

The public's mixed perceptions of the CVC (attribute 17) also points to the need for a social marketing program. Since the CVC acknowledges that they could market themselves better, it then becomes a question of a matter of degree. Elaborate social marketing programs, like the recycling campaign in the 1980's, can be expensive. Yet, smaller well designed initiative are possible, especially if it is possible to partner with other organizations to offset the costs. The success of any program is largely dependent upon the people delivering the message. In this respect the CVC also acknowledges that their people could use training in how to make presentations and general marketing techniques. Also, if the CVC were to gain name

recognition with water resources it would add legitimacy to their cause, encourage volunteers, and expand partnership and funding opportunities

There were several attributes that suggested initial targets for more specific social marketing programs (attribute 11). For example; the conservation of water within the household; the concepts of a watershed and a buffer; groundwater contamination and recharge areas; and how to tell the state of health of a stream, to name a few. Some of the techniques that can be used for these and other programs were outlined in chapter two and will not be discussed further here since many of the operational decisions should be made in consultation with the public.

There is one last reason that a marketing program should be adopted; the public needs to know about the communities hard work and how it is benefiting them. The link between people's efforts and their quality of life (attribute 16) must continually be reinforced so that the environmental cause is seen as being worth while. This is why the publicity and use of greenways (attribute 15) is so important; it strengths people's perceptions of the link. Social marketing is about the sale of ideas and the publics acceptance of those ideas. The future's environmental health is dependent upon people accepting the ideas embodied in the principles of stewardship, but in far greater numbers than have occurred in the past. The ultimate goal of all the marketing efforts together should be to convince the public that their security and well being is dependent on the CVC and that they cannot envision a future without them.

5.3.3 Societal Guidance in the C.EN.D. Model

A watershed plan is by its very nature a technocratic process because of the expertise required to formulate it. To try and institute a community environmental development program without the help and guidance of experts would be either impossible or fall short of its potential. Conversely, the wealth of resources that the public brings to stewardship merits them a say in the direction of the projects. The necessary link with the public in order to conduct future programs sets up Etzioni's model of elites and active publics as depicted in figure 2.3. There must be consensus between the "overlayer" who partially guides the process and the socially mobilized volunteers that are aware, active and potent (Etzioni, 1968). One of the emerging attributes was that the public wanted to be consulted and involved, in other words they wanted interwoven planning, at least on a simplistic level (attribute 21).

A governance component in the model is also consistent with community development doctrine. In section 5.4.1 it will be shown how these principles (discussed previously in the literature review section) manifest themselves through the workings of the governance component of the model.

The other rationale for a societal guidance component in the model is to overcome the second short- coming that social learning programs are recognized as having; they require a public validation of knowledge. Beyond the endorsing of a program or project by the public this structure is intended to act as the documenter of events and recorder of successes and failures

for future use. The public indicated that it wanted organized, well thought out events, and this will help insure that this occurs.

5.4 How the C.EN.D. Model Works

There are two premises that the model is built around. The first is to begin with simple tasks (ameliorative change) in Stage 1 and to increase the difficulty of the tasks over time, until Stage 3 where the goals of the watershed plan are being achieved. The second is that the model uses interested parties (i.e. environmental activists) to affect the initial changes and as catalysts to transform the environmental consciousness of the entire community over time. The model is therefore based on an evolving process of community environmental development over time. Correspondingly, the degree of control exerted by the CVC over the process should decrease from Stages 1 thru 3.

5.4.1 Stage 1

The findings on the correlation between age, education and the environment are what will drive the model, particularly in the early stages. The initial targets will be existing organizations, especially those that are involved with youths, adolescents and young adults. The rationale for this goes beyond the statistical findings; it attempts to play on human nature too. Adults are more likely to become involved in activities if it involves their children. Also, children often act as the household watchdog, insuring that the desired behaviour happens. In the interviews, many of the people turned to their children if they were present and asked "We recycle such and such, don't we?". Last, by targeting the younger markets it

is hoped that the lessons learned will stay with them as they mature and are passed on to the next generation.

Geography and science teachers across the watershed could be approached to help create a program (or part of a program) centred on the environment and water conservation (like the groundwater festival). There could be competitions among the schools as is done in other parts of the province. Simplified monitoring programs could be established, and the general levels of awareness raised through the regular contact with nature. Other organizations such as scouts and guides could participate in water awareness programs like the painting of fish on the street next to sewer intakes and stream bank clean-ups. Environmental day camps could be established (or expanded) at Island Lake Reservoir and other conservation areas.

Marketing programs with more sophisticated messages could seek partnerships with existing environmental and nature organization, such as the local hunters and anglers, and devise ways to distribute information to the general public. One good example of this has come out of this research. The undergraduates that helped administer the environmental survey produced the pamphlet called "Water, What You Should Know. A Guide for Orangeville Residents". Negotiations are proceeding with the local Hunters and Anglers to fund the printing of a pamphlet, with the distribution details still being worked out. Another educational resource that comes out of this example is the work performed by Universities and Colleges. These institutional arrangements are changing too and there exists an opportunity for partnering with them for future research.

The establishment of four or five stewardship committees throughout the watershed is key in stage 1. The committee's formation could be patterned after an E.E.A.C. or a L.A.C.A.C., where the public is invited to write in and explain their reasons for wanting to participate along with their résumé. In selecting the committee the CVC would choose the best candidates that are representative of the community (i.e. it should represent the spectrum of land owners and interests present in the community) (MNR, 1995). This structure is intended to get around placing 'elites' that are not representative of the whole community in a position of power, as has sometimes been the case under representative democracy structures. Thereafter, the procedure for election to the executive committee should evolve towards being more democratic (steps that outline this are in Appendix B). Other methods of establishing a stewardship committee can also be considered if the CVC so choses.

The committee will typically have several projects in-progress at one time. Each project will have several partners, so there will be literally hundreds of organizations and participants all working together towards the goals of stewardship (Caldwell et al, 1997). It will be the committee's responsibility to coordinate the efforts of these participants so that the respective projects are carried out effectively and efficiently.

The initial functioning of the stewardship committee will probably require considerable input from the CVC to guide them. The main functions that the Committee will perform in the beginning Stages are:

- determining how the public measures the success of a project, what are their expectations;
- In the Case of Orangeville: to review the Best Management Practices in the technical document and on how to accomplish the objectives in each of the BMP sections. The focus should be to plan each BMP from a stewardship perspective with an emphasis on expanding the number of facilitators and the funding for each of them. (Look for Partners);
- Prioritize and cross reference each of the stewardship tasks (from above). Create a common vision;
- Structure the organization to accomplish these tasks, as suggested in Appendix B;
- Record everything and create a data storage methodology that is easy to access and manage with the CVC's help.

Stage 1 is characterized as being dominated by the communication of simple marketing messages, searching for and establishing partnerships, and the building of a new structure that is capable of undertaking stewardship programs. It is almost solely driven by CVC initiative.

5.4.2 Stage 2

The hard work and organization that occurred in Stage 1 will begin to allow for increasingly complex stewardship initiatives to begin in Stage 2. It is in this stage that 'Action' moves to the forefront. The increased number of people involved, the diversity of funding (in kind and otherwise) and the in place organizational structure, will translate into the Stewardship Committee being able to undertake projects that have mostly been performed by government agencies in the past. Projects like stream bank restoration, residential water conservation refitting, and the establishing of greenways on public land will be possible.

The marketing messages that are communicated to the public will become increasingly complex as the public's knowledge of the environment becomes more sophisticated. Campaign's will deal with systems and interrelationships and not just 'do's and don'ts.' Additional markets (some traditionally more difficult) can be developed beyond the ones initiated in stage 1.

The executive stewardship committee's role will evolve into more of the coordination role mentioned earlier. The records that have been kept by the Committee will act as a 'how to' guide for projects and success will validate the methodology. Projects will become increasingly less ameliorative and progressively more goal oriented (i.e. they will deal more with attitudinal changes). The numerous sub-committees that will have evolved, will become increasingly autonomous in their project functions. And, there will be the beginning of the accumulation of organizational assets that can be banked for the future.

One of the key elements of a Community Environmental Development program is the community's influence over programs and the absence of government control (Caldwell et al, 1997). Stage 2 is characterized by the community's awakening to these elements and that they have the resources required to take effective action. Further, they (the community) will begin to see that they are only responsible to themselves and not to any external authority. The role of CVC will become more of that an enabler, facilitator and expert, whereas the committee will be assuming the responsibility of being the doers (Caldwell et al, 1997).

5.4.3. Stage 3

Stage 3 represents the highest level of community development. The public will exhibit signs of double-loop learning (i.e. functional comprehension). This will be evident in their comprehension of both complex environmental systems that effects their daily behaviour and the in their choice oft methodologies used to effect positive change. By this stage, the foundation for a permanent paradigm shift should be laid. The marketing programs will become aimed at maintenance and recruitment rather than changing behaviour.

Control will be in the hands of the community, with the goals and objectives being determined by the public. The role of the CVC will have evolved into where they are: advisers; researchers; information managers; and assist in the coordination of activities between the 4 or 5 executive committees across the entire watershed. The idealized situation is where rational discourse occurs between the public, the committee, and the CVC over goal attainment for the next generation of issues. And, that the issues can be dealt with in a constructive manner because of the knowledge that has accumulated, and structure that has evolved through time.

Chapter 6.0: Recommendations and Conclusions

6.1 Recommendations

The following recommendations, based on the preceding model, are meant for consideration by the Credit Valley Conservation Authority. If the CVC were to implement the C.EN.D. Model it may consider one or more of the following;

1) establishing executive stewardship committees (maybe five) throughout the watershed and structuring them around membership and fund raising;

2) realigning part of its (the CVC's) structure by geographic area to correspond with the territories of each of the new committees created above. The obvious candidates for this would be the planners since they are already aligned by municipality. These people will function as community outreach people, responsible for coordinating the activities in each area, marketing and otherwise.

3) training the people that are to become designated as community outreach people in the area of communications and social marketing;

4) either, creating a marketing department that includes the community outreach personnel or contract an external marketing firm to conceive marketing campaigns for the outreach personnel.

5) creating/ reactivating the conservation fund similar to the Conservation Niagara Fund at the NPCA;

6) re-evaluating each of the BMP categories in the Subwatershed No. 19 technical document from the perspective of "How can stewardship help to accomplish this goal?";

7) diversifying and expanding the 'Facilitator' function in each of the BMP categories in order to take some of the burden off the CVC;

8) diversifying the funding sources and re-evaluating the cost estimates of each of the BMP categories to replace monies that have been withdrawn by senior levels of government;

9) starting a public awareness marketing campaign for Mill Creek and other tributaries of the Credit River in the Town of Orangeville, that build on other projects already started;

10) investigating possible methods of cataloguing and storing information for the stewardship committees.

11) increasing its presences throughout the watershed through satellite offices, either on a part-time or full time basis.

6.2. Implication from Research

The case study involved the Town of Orangeville that has a population of about 20,000 people. The results that were obtained compare favourably to other communities of this size within Ontario and Canada. The question that remains to be answered is: 'Is there a critical size of population that once surpassed will require modifications to the model ?' For instance if the population, and therefore the participant numbers are large, then the administrative function centred around the executive committee may have to be adapted. The key here is to have the decision making process remain in the hands of the community and not to create another bureaucratic layer.

The governance portion of this thesis deals with the arguments centred around representative democracy versus participatory democracy. The model is obviously based on the notions of participatory democracy and the underlying premise is that this form of governance is preferable to representative democracy. People often do not make the distinction between the two and believe that our laws are passed by a majority of the population. They are wrong in this assumption. Most of our laws (and corresponding regulations) are made by a minority comprised of our elected representatives and their administration. This thesis and the resulting model make the observation that the environment effects everybody, everyday, it

therefore should be the business of all how it is managed. Many people do not believe that participatory democracy can be effective. Fortunately there are enough examples to the contrary to warrant experimentation with community stewardship and since the umbrella of regulatory administration still exists (even if it is in a diminished capacity) there is limited liability attached to efforts in this direction, at least in the short term.

The last implication to arise from this research is whether the CVC is willing to make the internal adjustment required by this model. There are three apparent changes that would be required. The first is that the CVC philosophy would have to become community based, which would require revisions to their business plan that reflected this total commitment. The second is that social marketing on the scale envisioned here is a new field for them. It would require a greater commitment of time and resources than it currently receives under the guise of communications. This may require the retraining of some staff, together with partnering with external marketing experts. The last change required would be in the area of community outreach. If the suggestion of rewriting the planners job description were taken there would be certain advantages. Most planner, if they have graduated from an accredited planning program have had some indoctrination and training in community relations. They should therefore already be aware of the value of public participation. What would be require is for them to become more entrepreneurial in their approach to dealing with the public than they are use to. This may require additional training. Taken together these three changes would ensure the future of the CVC for many years to come.

6.3 Future Research Needs

As result of this research there are three areas that have become apparent that require further study in the future. Each relates to the three components in the model. They are as follows:

- There is a need for further study into the structures of volunteer organizations associated with the environment to determine how and why they function under different circumstances.

- There is a need for further research into the relationship between business marketing and social marketing, so that programs for the environment, beyond the past resource consumption campaigns (i.e. gasoline), can be developed.

- Further analysis of social learning techniques in the environment field is required. Many of the programs that have been studied thus far relate to Stage 1 in the model. There is a need to study the learning patterns associated with more difficult projects.

Finally, research should continue in to people's behaviour and perceptions of the environment and their relationship with it. Only through uncovering this information can we begin to relate a persons quality of life to the environment in a way that is meaningful to them.

Glossary

Several key words or phrases will be used throughout the text. Definitions are provided below.

Double-Loop Learning: As opposed to single-loop learning. The latter involves simple changes in the tactics or strategy of the action to solve a given problem; the latter requires an adjustment of the norms governing the action process and, specifically, a change in the actor's theory of reality, values, and beliefs. i.e structural vs functional learning.

Subwatershed: A subwatershed encompasses all the land (surficial and subsurface) as well as the ditches, tributaries and main branches which drain to a common point. In this case, the Subwatershed is No. 19 which is comprised of 62 km^2 of land, and a series of tributaries which drain to the headwaters of the Credit River. (Technical Document, Subwatershed No. 19, CVC, 1997)

Subcatchment: A subcatchment includes the lands (surficial and subsurface) that drain to a tributary, such as Mill or Monora Creek. (Technical Document, Subwatershed No. 19, CVC, 1997)

Natural Environmental Resources: The term natural environmental resource will be used to describe various environmental or water related attributes which presently (or potentially) exist within Subwatershed No. 19. These include:

- aquatic resources;
- terrestrial resources;
- water resources; including water quality and ground water;
- floodplain characteristics including flooding;
- erosion - stream morphology;
- aesthetics; and
- recreation.

(Technical Document, Subwatershed No. 19, CVC, 1997)

Ecosystem Approach:

Since this thesis deals with stewardship and is aimed at the average person a non-technical definition has been chosen. The following is based upon the Crombie Commission's work - 'Watershed'. An ecosystem approach considers the following:

- everything is connected to everything else;
- human beings are part of nature and not separate from it;
- human beings are responsible for their actions and associated impacts; and
- economic health and environmental health are mutually inclusive.

Best Management Practice:

A Best Management Practice is measured (active or passive) that when implemented, will assist in protecting, enhancing, or restoring the environmental features. Best management Practices may be active measures; e.g., the construction of a stormwater management facility to control peak flows and reduce pollutant loadings from an urban area. Alternatively, they may be passive; e.g., implementation of a top-soil bylaw to minimize erosion during construction or a buffer strip to protect the integrity of the streams.

Terrestrial:

Terrestrial resources include: landforms, such as moraines, kettle lakes, escarpments, glacial lake shorelines; natural vegetation features such as woodlands, savannas, plantations, wetlands; and wildlife, including mammals, birds, reptiles and amphibians. (Technical Document, Subwatershed No. 19, CVC, 1997)

Natural System Linkages:

Natural linkages refer to the inter-relationships between environmental features. These inter-relationships can be described in terms of attributes, function and linkages.

An **attribute** is a physical characteristic, structure or uniqueness of a natural feature, for example woodlands are areas of natural forest cover that include mature trees, an understorey of shrubs and ground cover of forbs and grasses that may include rare Carolinian species.

A **function** describes a process or an activity that an area serves within the context of the landscape, for example woodlands provide habitat for wildlife, shade streams to moderate temperatures and slow the rate of runoff into streams.

A **linkage** is a pathway, connection or relationship that an area shares with other areas that is part of a larger complex, for example a woodland may provide a wildlife corridor between two larger natural areas which together, serve to sustain a white tail deer population. Another example of a linkage includes the flow path of water infiltrating into the ground water and resurfacing at the discharge location, thereby providing baseflow for aquatic resources. (Technical Document, Subwatershed No. 19, CVC, 1997)

Ecologic Level: An ecologic level is defined as an ecological condition or state of health where the functions and linkages of the natural components of an ecosystem are in balance with the human components of the ecosystem. In other words, any trends toward progressive deterioration or degradation of the natural environment will be halted, reversed or redirected to achieve an equilibrium with the human environment. This state of balance or equilibrium may be maintained at different levels based on the value that the local community places on natural ecosystem components. (Technical Document, Subwatershed No. 19, CVC, 1997)

Fluvial Geomorphology: The study of physical features of the earth's surface which describes the features of a watercourse. There are many features of the stream channel such as width, depth, velocity, discharge, slope, channel material, sediment load, and sediment size which form the morphology of watercourses. In a natural watercourse these features are dynamic, yet operate within a given equilibrium. A change in any one of these features could alter the watercourse and result in accelerated channel erosion or sedimentation. (Technical Document, Subwatershed No. 19, CVC, 1997)

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Appendix A: Mill Creek Fact Sheet

Credit River Subwatershed No. 19
Mill Creek Fact Sheet (Technical Document, Subwatershed No. 19, CVC, 1997)

Environmental Resources

Groundwater Resources

- significant baseflow contribution in the upper reaches above 'C' - Line
- baseflow is highly sensitive to groundwater withdrawal from the overburden or shallow bedrock
- highly susceptible to contamination

Surface Water Resources

- 92 ha drainage area
- permanent baseflow in headwaters, however some reduction in volume through the town of Orangeville results in intermittent conditions
- 3 flood prone areas, Mill Creek at the Credit River, Dawson Road, and Centre Street East of Broadway

Aquatic Resources

- Level 2 riparian and valley corridor
- < 30% of the riparian corridor in natural vegetation
- moderate to very tolerant warm water community

Terrestrial Resources

- 22 feature in high recharge or on riparian corridors
  (18< 4 ha, 3@ 4-16 ha, 1@ 16-32 ha)
- 1 primary terrestrial corridor for protection/revegetation
- 5 other features < 4 ha

Stream Morphology

- 50% of the watercourses have natural channel systems, primarily in headwater streams
- 50% of the watercourses are channelized and encroached upon by historical development within the Town of Orangeville

Exiting Land Uses

- • 60% urbanized (Town of Orangeville)
- • 15% zoned for future urban development

Environmental Protection Targets

Groundwater

- maintain or enhance on-site recharge and discharge volumes
- maintain current groundwater quality
- protect groundwater discharge areas and volumes

Surface Water Quantity and Quality

- maintain exiting peak flows for the 100 year storm (9.49 m^3/s @ Credit river. Table A1.9 in the technical report)
- maintain baseflow as a minimum
- maximum temperature 22°C in headwater streams
- Total Phosphorous • 0.1 mg/L (annual average for dry/wet weather conditions)
- Suspended Solids • 20/200 mg/L (annual average for dry/wet weather conditions)
- Dissolved Oxygen 5.0 mg/L minimum at all times
- E. Coli. 100/1,000 cts/100ml (geometric mean conditions for dry/wet weather conditions)

Aquatic Communities

- Class III moderate tolerant aquatic community
- Level 2 riparian and valley corridor
- at least 5% of the stream reaches pool:riffle dominated
- minimum pool depths: 0.2 m
- 30 - 50 % of banks width woody riparian vegetation

Terrestrial Communities

- Protect all Class I features
- use native species for revegetating corridors
- select vegetation community types based on soil moisture/fertility, flooding/water table regime and composition of adjacent communities (also see tables 7.4.2 to 7.4.4, Technical Document)
- establish terrestrial corridor (minimum width 100m) as per Figure 7.1 ??

Stream Morphology

- Maintain post-development shear stress conditions on channel systems to pre-development conditions by controlling backfull frequencies and durations
- maintain dynamically stable, natural channel systems
- balance sediment regime
- minimize fine sediment loads from runoff

Key Best Management Practices (refer to section 5.0 of technical document)

- stormwater runoff volume controls utilizing large open space and centralized end of pipe facilities to infiltrate clean runoff for maintaining water budget and stream bankfull flow conditions.
- stormwater runoff flow controls and detention ponds for flood control, water quality and stream morphology protection. (see Table A1.12, Technical Document).
- flood protection works at Dawson Road
- natural channel design for all stream works
- upland forest corridor resource enhancement
- riparian planting along Level 2 riparian and valley corridor
- development exclusion in all Class I features
- minimize withdrawals adjacent to the upper reaches of Mill Creek
- minimize the potential for contaminant spills and minimize application of de-icing agents, fertilizers, pesticides etc.

Future Study Requirements

General

- Environmental management Planning Studies on tributary bases (including below)
- headwater tributary assessments
- develop community (neighbourhood) based stream improvement program linking into urban renewal and cultural heritage programs

Groundwater Resources

- detailed hydrologic studies on baseflow impacts for any future groundwater withdrawal or storm water management facilities
- assessment of potential impacts of Wells 2,3,4, and 7 on Mill Creek

Surface Water Resources

- hydrologic update reporting, for maintaining peak flows from proposed land use changes, as required

Aquatic Resources

- inventory headwaters for presence of coldwater species
- identify riparian and valley corridor width based on functional characteristics and existing vegetation features

Terrestrial Resources

- EIS required adjacent to all Class I features
- EIS required within/adjacent to all Class III features
- naturalization plans for all Class I/II riparian/valley corridors and terrestrial regeneration areas

Streams Morphology

- detailed fluvial geomorphology study to determine design criteria for managing bankfull flow conditions and for natural channel design works , as required

Appendix B: Tools For Running a Successful Stewardship Group

Tools For Running a Successful Stewardship Group

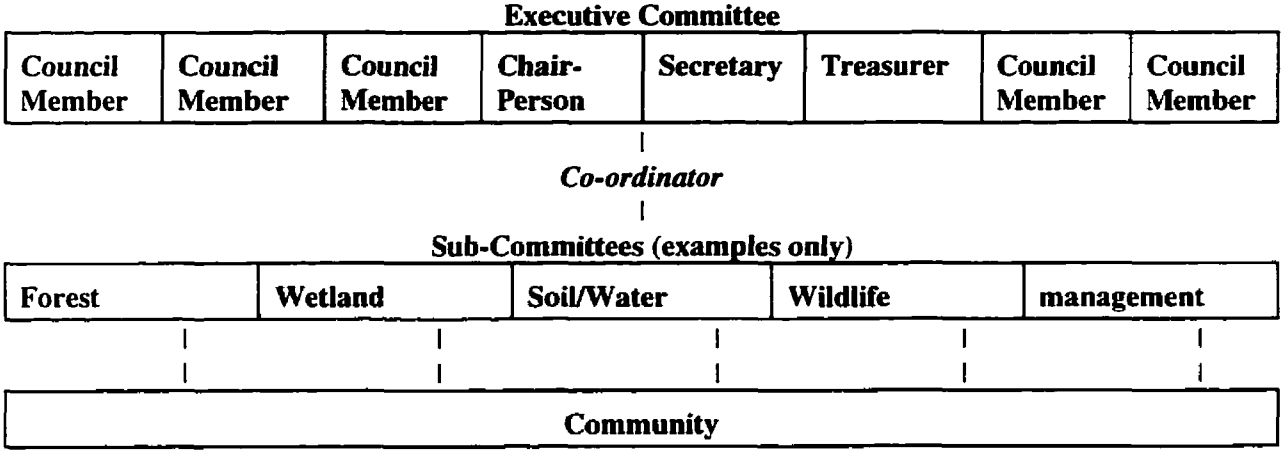
The Stewardship Council currently consists of a five member interim council. The group would like to begin to undertake stewardship projects as soon as possible. Before they can do this, they must decide on a set of policies and procedures as well as some concrete bi-laws for the group to work from. The first topic in this section, on tools, could be incorporated into the procedures for running the Stewardship Council. The second section deals with factors the group will have to consider when trying to keep the various groups associated with stewardship projects on track. This second section may eventually be incorporated as part of a strategic plan for the stewardship group.

Most of the ideas have been drawn from Australia's LandCare program. The LandCare program is a community driven initiative. One of the goals of the Stewardship Council is to keep projects in the hands of the community. Components of the LandCare Action Pack which apply to running a community based group are included under the group maintenance of this paper.

Roles for Stewardship Council Members (In relation to the community)

The first thing the stewardship council must determine for their official policies will be the organization of the group. The size of the group will influence the amount of people available for executive positions, and the make-up of sub-committees. The executive committee should be made up of no more than 8 members (LandCare Action Pack). Most groups, regardless of size, need at least a Chairperson and Secretary/Treasurer.

Figure 1: Organization of Stewardship Group



The following are outlines of the duties of each executive position:

Secretary: The executive should inform the secretary of matters they want to be brought before a General or Committee meeting. Business from the last meeting should be included in the agenda. A listing of all people who will present reports should also be included. The secretary should create an agenda that can be circulated at least one week before the meeting.
During meetings: notes must be taken in point form only; any resolutions that are passed during the meeting must be recorded by the secretary.

Treasurer: Must maintain accurate financial records and be prepared to comment at meetings on the state of the group's funds.

Chairperson: Must focus the co-ordination of the group. The chairperson steers the committee by ensuring members stick to points on the agenda during meetings. If a decision has to be made, the chair must write it out and read it aloud before voting takes place. (From: LandCare Action Pack)

Sub-Committees:

The types of projects undertaken by the stewardship group will vary in their focus. Since it will be impossible and inconvenient for the executive to direct every single project, sub-committees should be created for each project. Sub-committees are formed from group members who have similar interests. Each sub-committee can have its own Chairperson and Secretary if necessary. The sub-committee must report to the executive committee - it is the executive who run the day to day activities. (LandCare Action Pack).

Advantages:

- Attract people with different interests and ideas
- Become more enlightened about problems that face different groups of landowners to help the group as a whole set its targets
- Sub-committees allow task to be delegated
- Allows for a broader range of places to look for funding
- Teams can be created for managing and publicizing different projects
- Creates good records and well developed plans which can be used for funding proposals.

Co-Ordinators (not always necessary)

Co-ordinators may be required if there is not enough voluntary help available to achieve the group's aims and goals. A co-ordinator may be hired or shared with other stewardship groups, or may be funded by and outside agency (LandCare Action Pack) .

"Co-ordinators must keep in mind that they are the servant of the Stewardship group, not the master" (LandCare Action Pack), thus the duties of the co-ordinator are as follows:

- The primary role of the co-ordinator is to maintain a high level of activity and enthusiasm amongst members, ensure action, help monitor the group, assist the management committee (executive) and promote the group to the community.
- The co-ordinator does not do any of the work of the executive as previously outlined.
- The co-ordinator is also a link to technical advice, plans and coordinates projects and seek outside financial advice.
- The group should agree on the co-ordinator's role.
- The co-ordinator must work under the guidance of extension staff, and are generally chosen from within the group for a part-time position.(In the case of the SC, this Credit Valley Conservation appointed)

Running Meetings:

The way in which meetings are run will depend on the size of the committees, the policies determined by the group and whether or not the group is incorporated. As an incorporated organization, you must have, at the very least, one Annual General Meeting. The group must also keep a register of members. (LandCare Action Pack).

Rules for Meetings

In order to run meetings, there must be an acceptance of the principles of a democratic meeting: (OMAFRA 94-003)

1. Every member has rights equal to every other member.
2. The will of the majority must be carried out.
3. The minority must be heard, its rights protected.
4. Only one topic will be considered at a time.

The group may desire a less formal set of rules for smaller gatherings, or decide to follow a more stringent Parliamentary proceeding. The type of meeting can be determined by the bi-laws created for the group. The Incorporation section of this report contains information on the types of bi-laws you may want to consider. For further reading: OMAFRA, Factsheet 94-003. *Procedures for Meetings.*

Types of Meetings:

The types of meetings, items discussed in meetings and members present are entirely up to the group's procedures and policies. The suggestions listed here are from the LandCare Action Pack, with modifications according to the size of the group:

Committee Meetings - should deal with the planning and administration of the group.
Sub-committee meetings should focus on planning and administration of the various projects.
Only the members of the committee should attend these meetings.

General Meetings - allow the committee to report back to the group and allow for further discussions. They should cater to a wide variety of interests, and may include theme nights and guest speakers. These may be preceded by social nights. Members of the sub-committees and the executive should attend these meetings.

Annual General Meetings - these must have a degree of formality. Rules for running the meeting will depend on the size of the gathering. Some points to include in an annual meeting:

- financial records should be made public
- the whole group should ratify decisions
- election for office bearers (nominations should be done beforehand)
- review achievements and set goals for the next year
- consider guest speakers, displays and technical updates

If you wish to be more formal at your Annual General meetings, the following Factsheet contains a summation of Parliamentary Procedure at a Glance: OMAFRA, Factsheet 94-003. *Procedures for Meetings.*

Group Dynamics

The Stewardship Council is a group which has been brought together for the common need of Stewardship. In order to organize into sub-committees for various project and be effective, there must be a sound group dynamic. This can be achieved by looking at how to deal with individuals and how to run groups of individuals.

Dealing With Individuals

There are several ways in which to ensure individual members are included in the group process as a whole. Some of these include:

1) Get to know members by recording their skills and knowledge and tap into these for various tasks:

"...you can't delegate properly if you have only a superficial knowledge of your subordinates." (James M. Jenks and John M. Kelly, 1985). In this case, sub-committees are the focus of delegation.

To ensure this, you might consider handing out surveys or charts and you may want to incorporate the use of a "needs" chart such as that of Ivan Scheier's "The Window of Work" table. Each member is asked to write what they enjoy doing, what they would like to learn and what they detest doing:

I Enjoy	**I Want to Learn**	**I Don't Want to**
-horticulture -meeting new people -socializing -taking pictures	-weed identification -working with a video camera -public speaking	-work in a booth -bookkeeping (Source: OMAFRA Factsheet 89-178)

From this chart, you can match the group members with appropriate tasks and projects as they arise.

A register should then be compiled for each member and supplemented with details acquired through workshops, discussions as well as application forms. It would be useful to obtain the following information (From: LandCare Action Pack):

- tasks that they like doing;
- areas of skill and knowledge that may be helpful to others in this group;
- contacts within the community; and
- membership of other groups and organizations.

2) Develop strategies for training and development of skills and knowledge that may be lacking in individuals. The target areas for future skill development should become clear from the information collected in your membership register.

Dealing With Groups

Once you know about the individuals in your group, you will have to consider the way that they will interact in a group setting.

The goal of any group effort should be to "*...build a climate of trust, support and an ethic of sharing and ownership...*" *(LandCare Action Pack)* amongst individuals with different perspectives.

The following are some suggestions to assist with creating this climate: (LandCare Action Pack)

- promote participation
- take into account individual's skills when assigning tasks
- spend time with people and delegate
- share knowledge and skills with group members
- give public recognition of good performance

You may also consider creating a team constitution to make sure each member understands the climate in which they will be working. This constitution can be considered a set of policies for the group. The following is an example of such a constitution:

OUR TEAM'S CONSTITUTION
Article One. We will always be on time for meetings. Right on time. If we must be late or absent, we will inform the team leader or a team member at least a day in advance.
Article Two. We will always come to meetings prepared to work on the agenda that we will receive before the meeting. Our preparation and data collection will be complete, and we will be ready to discuss the issues on the agenda.
Article Three. We will always respect the opinions and feelings of all individuals. Each member has equal participation in our meetings. When discussing team business, members should expect to contribute to discussions and be listened to with respect.
Article Four. We will always avoid blaming people for the shortcomings of our team. If our team somehow fails to do its tasks properly, we will examine our team process and attempt to improve it. If individuals are having trouble meeting their commitments, the team will support them in every way possible.
Article Five. Members will support the decisions of the team after they are made. Undermining team decisions or second-guessing and bad-mouthing the team and its work to outside the team setting to non-members is *unacceptable* behaviour.
Article Six. Members will live up to their team commitments, recognizing that failure to do so affects the whole team's progress. When in jeopardy of not meeting their obligations, members will notify the team in time for other members to take supportive action.
Article Seven. When faced with a decision, we will first decide *how* to make the decision. Our general rule is to (1) state the problem, (2) discuss different ideas, (3) examine the benefits and risks associated with different approaches, and (4) select an approach we can all support. Other methods may be appropriate.
Article Eight. We will deal with conflict in a productive way. Our general rule for conflict is to understand the problem as best we can from each side's perspective. To do that we will listen to all sides of the conflict, looking for facts and evidence. If there is still a conflict about facts, we will gather additional data. When the problem is understood, the team will help those in a conflict create alternative approaches. We will call a special meeting to address the conflict.
Article Nine. We recognize that working on a team usually results in high-quality ideas and decisions, as well as fun. If we find we are not experiencing these benefits of teamwork, we will pause to assess how we are working together until we better understand our team and our work.

Source: Maginn, 1994

Resolving Conflict:

Since the group will be made up of different landowners, community members and representatives of different government organizations, conflict may arise from different viewpoints.

There is no one "right" way to resolve conflict, however, there are some communication skills that might help avoid conflict. Communication, in the form of listening skills is important in order for all group members to get their point across.

Should conflict arise, these are some common sense points to consider when trying to achieve group consensus (LandCare Action Pack):

Establish Trust and Confidence by:

making contact with people in conflict and reassure them
listen to their feelings
rebuild trust
agree to talk
lay ground rules to get people talking

Negotiation:

When making decisions for the good of the community through your Stewardship Council, you might follow a set of steps similar to the following: (OMAFRA Factsheet 93-043)

1. Examine the situation.
2. Arrive at goals.
3. Identify key problems.
4. Determine priorities.
5. Identify and analyse alternative solutions.
6. Select a course of action.
7. Develop and action plan.
8. Implement the plan.
9. Evaluate the outcome.

Conflict will arise when trying to come to a consensus for solutions to problems. The following is a short list of steps you can take to negotiate in a decision-making situation:

- identify key issues
- explore different points of view; past, present and future

Problem Solving:

At this point you may want to take time out to explore problems through both divergent and convergent thinking. A problem solving model employs six steps, which begin with the expansion phase and end with the closure phase (Albrecht, 1980):

Expansion Phase:

1. Problem finding.
2. Problem stating.
3. Option Finding.

Closure Phase:

4. Deciding.
5. Taking action.
6. Evaluating results.

In the expansion phase, or the divergent thinking phase, ideas must be generated from all points of view, without any decisions being made. Following this, conclusions must be drawn, through divergent thinking, after exploring all of the options. (Albrecht, 1980).

This kind of problem solving ensure that you have:

- explored future options

So that you can:

- agree on solutions

Behavioural and Relationship factors must also be considered, to minimize conflict (LandCare Action Pack):

be impartial;
pick the best time to listen;
remember: conflict resolution is about dealing with differences, not similarities

SOME FURTHER READINGS FOR CONFLICT RESOLUTION:
Fisher, Roger and William. "Getting to Yes"

OMAFRA Factsheet 94-003. "Consensus: Another Method of Decision Making in Groups" in: *Procedures for Meetings.*

Keeping a Group Together

Once the group is organized and the various projects are underway, the group must be maintained to ensure success. This section outlines various aspects or techniques that must be utilized in keeping a group together.

Communication

Communication is essential in keeping groups informed. Regular interesting gatherings, such as general meetings, field days and workshops. Another way to keep communication is through written media such as newsletters. (LandCare Action Pack).

The web-page may be used as an up to date information source for group members, stakeholder government agencies, funding agencies and the community.

Motivation

Motivation is: "...finding out what people like to do- and can do well- and then letting them do it". (LandCare Action Pack)

Some questions you can ask if the group needs a lift are:

- What is rewarding to us as a group?
- What is rewarding to me as an individual?

These questions can be answered through group discussions. By finding out what people want to do and by providing clear goals, group members will stay motivated.

There are several ways of motivating people and keeping them motivated. Here are four things you might consider when attempting to motivate volunteers: (OMAFRA Factsheet 92-039)

1) Provide a reason for people to participate in your organization
2) Provide recognition
3) Provide goals that are clearly defined and communicated
4) Conduct stimulating meetings

Encouraging Participation

The register that was suggested earlier documenting each member's skills and interests is a good resource for encouraging participation of the members in their area of interest.

As well, you can encourage participation by : (LandCare Action Pack)

- using a mentor program in which a member is responsible for a new member; they will be required to: get to know the new member, bring them to meetings and encourage them to volunteer for different tasks.

- devote time after activities to objectively assess the success and failure of both processes and people. Encourage all members to express their perspectives.

- record the key people, processes, highlights, low points and recommendations in the minutes of meetings.

- don't express poor performance negatively but look for positive direction and provide necessary support.

Direction

With a clear set of goals and objectives, the group will stay on track: "if you don't know where you are going, then how will you know when you've arrived?" (LandCare Action Pack)

To achieve goals and objectives for various projects, all members of the group may want to engage in a *BRAINSTORMING SESSION.* Through the brainstorming process, the group can explore many alternatives and courses of action as different projects arise.

You may want to keep the four rules of brainstorming in mind:

1. Aim for quantity - try to devote a short amount of time (ie. 10 minutes) to generating as many ideas as you can.

2. Encourage free-flowing ideas - do not be afraid to offer any ideas out of fear of them being strange. Some of the best ideas come from being permissive when generating ideas.

3. Defer judgment - remember that when you are generating ideas, you are not making decisions on which idea to use. Do not be critical of your own, or other people's ideas at this stage.

4. Tag-on - if you run out of ideas, then try to build on previously mentioned ideas to create new ones.

To get the ball rolling you should consider these steps:

- Establish a time limit: approximately 10-15 minutes;
- Write out your ideas on paper, record them or use a computer or blackboard;
- Re-write the list into a more comprehensive form.

Action

"Generally, it is important that group members be able to focus on various issues and to physically do something about problems." (LandCare Action Pack)

It is important for stewardship groups to take action so they will not fall into the trap of simply being all talk and no action. When the community can see the fruits of your efforts you will be able to rally more support and gain more participants.

In order to convert ideas into actions, you may want to consider the following points: (OMAFRA Factsheet 93-041)

- Develop innovative approaches to accomplish your strategies
- Check that your planned activities are consistent with your mission
- Divide your proposed activities into manageable tasks
- Include what you will do, who's responsible, what resources are needed (time, money, expertise), when they will be done, how you will monitor their progress and measure their success

Education:

It is important to make sure group members are aware of the problems and solutions involved in stewardship. Education can be achieved by various social activities. This can be done by: field days, farm walks, information nights, whole farm planning, and young Stewardship groups etc.

- See education as an option in a subsequent section

Ownership:

"It is important to maintain local ownership of problems" (LandCare Action Pack).
This is achieved by having the members in control of the group. Members must run the group, not the committees or the co-ordinator. Some things to consider with respect to this (LandCare Action Pack) are:

- Change over membership regularly to ensure that the workload is shared by the entire group
- Hold regular general meetings where all members can contribute to planning and decision-making
- Ensure personal contact and communication through a newsletter or other forum

Resources

Without stable resources, it will be hard to keep the group together. The following is a list of some group resources you may want to secure:

Group resources:

- a comfortable meeting place;
- access to a photocopier or computer;
- access to equipment to do works on the ground;
- co-ordinate and effective use of equipment;
- sufficient labour to do the job;
- someone available to co-ordinate outside assistance and provide practical instruction; and
- sufficient funds to do the job

*** See the section on role of Co-ordinator since some of this will be provided by the MNR

Feedback:

"Remember the value of constructive advice, support and encouragement." (LandCare Action Pack)

Feedback is important in motivating group members. It can be done in several ways to encourage participation:

- publicly acknowledge contributions;
- recognize and promote behind-the scenes activities;
- use promotional tools; and
- use displays to indicate achievement

Monitoring Group Activities:

Depending on the project, there are various ways you might consider recording its progress. By recording the progress of a project, you will be able to give the group feedback, as well as provide strong motivators. The following is a list of some recording techniques (LandCare Action Pack):

Photos

- before and after
- important social events
- record breaking events
- overlays to show progress

Facts and Figures

- numbers of species of trees you plant at each different location
- number of people who turned up for a farm walk
- number of visitors to local project

Record everything - it gives the group a sense of achievement

Evaluations

"be flexible! - modify as you go along" (LandCare Action Pack)

Do this throughout the project to determine success and explore alterative directions

Some steps you may want to take to ensure you evaluate as you go along: (OMAFRA, Factsheet 93-041)

- Determine who will monitor your progress in accomplishing your various project plans
- Review the progress of your plan at each general or council meeting
- Hold a six-month review with your executive committee evaluate progress and make adjustments where necessary
- Continue to implement, review and evaluate projects on an ongoing basis

Communication within the group itself will keep the ideas flowing and encourage practical solutions to problems that occur. Consider feedback in the form of a team assessment to make sure group discussions are working properly, and to assess how well the members are interacting. From this assessment, changes can be made to group interaction to encourage a more productive atmosphere. The following is a sample of the type of team assessment that may be used:

Team Assessment										
Do We:	**Rarely**				**Sometimes**					**Always**
1. Ask each individual how her or she feels about the situation?	1	2	3	4	5	6	7	8	9	10
2. Ask for facts or explanations, and try to uncover what different thoughts or words mean to everyone?	1	2	3	4	5	6	7	8	9	10
3. Clarify discrepancies of opinion with facts?	1	2	3	4	5	6	7	8	9	10
4. Modify our views when faced with compelling facts and opinions?	1	2	3	4	5	6	7	8	9	10
5. Identify similarities and differences among the points of view in the team?	1	2	3	4	5	6	7	8	9	10
6. Reinforce open-mindedness-the willingness to listen to other views-and the need for cooperation?	1	2	3	4	5	6	7	8	9	10
7. Remain non-defensive when challenged, and avoid emotional encounters?	1	2	3	4	5	6	7	8	9	10
8. List the positive and negative aspects or consequences of each point of view?	1	2	3	4	5	6	7	8	9	10
9. Make sure that each team member participates?	1	2	3	4	5	6	7	8	9	10
10. Define the level of risk associated with a decision, and develop an approach that minimizes that risk for everyone?	1	2	3	4	5	6	7	8	9	10

(Source: Magnin, 1994)

Documentation

- this is essential for accountability
- funding agencies often require documentation

Good records also assist in keeping sponsorships and grants.

Duration of Group:

A rule of thumb to judge when a group is no longer needed is: "If the work the group set out to do is completed, and the community no longer support the group, then it may be time to wind up that group." (LandCare Action Pack)

Linking to the Community

Make the "community" aware of who you are to encourage participation - this can be done by an extensive publicity campaign.
(See also: Separate report on public involvement)

Check List for Carrying out Local Projects

"Before any project is decided upon, the group's aims and connection to the proposal need to be defined and understood" (LandCare Action Pack)

The following chart summarizes some points to consider before starting any project. The Stewardship Council may want to create a more inclusive strategic plan before each project begins.

Steps to Consider Before Carrying out Local Projects (Taken from: The LandCare Action Pack)
1) State on paper the landholder's responsibilities in relation to the project. If the landholder does not agree, do not continue. You might consider enlisting a hobby farmer whose activities are not as effected. Success will convince others to get involved.
2) Once funding is secured, a Committee of Management must be set-up, which includes the landholder. This committee must prepare an inventory, with stages, assistance and other members' contributions included. The landholder is not responsible for all activities.
3) Co-ordination to make sure materials are available, transport is arranged, outside help is organized etc.
4) Educational programs such as: speakers, farm walks, newsletters, articles etc. should include members ideas and experiences.
5) Once the project is completed, the group must know what will be done in an ownership change. This may be stated in a covenant written before the project is started.
6) Plan, Plan, Plan

Involving Local Government

"Local Government can help raise community awareness of issues and can help win support form the local community." (LandCare Action Pack)

The following is a summary taken from the LandCare Action Pack, of how to involve the local government:

Ideas for Involving Local Government
It is important to take the initiative in informing your local government Council that you exist rather than letting them just find out
Ask your Council to become a Member of your Group either on an annual basis or as a Life Member
Invite one of your Councillors to serve on your management committee or any relevant special purpose committee, so they can keep both you and Council up-to-date on information that may help in your planning of activities
Host a tour of a project area and show Councillors the problems and achievements, include a written handout
Invite Councillors to any events you have planned
Seek support with secretarial facilities such as photocopying, use of fax, keeping your mailing list up-to-date, distribution of general information and inclusion in information sheets of activities in your Municipality, etc.
Request the use of meeting facilities, such as the Council Chamber or Public Hall
Seek support of Council for proposals that involve areas of planning, such as revegetation, roadside conservation etc.
Provide input into the local planning process and decision-making
Include Council in your newsletter mailing list
Link into existing Council networks such as Chambers of Commerce, other community groups, educational and training facilities etc.

Appendix C: Answers to Questions to CVC Staff

Questions on Stewardship and Orangeville

1) The Environmental Awareness Survey that was conducted in March of this year indicated that over 60% of the people did not participate in any community organization. Can you think of ways to access the community in light of this figure?

2) Scott and Willets(1994) believe that even though there has been an enormous amount of media coverage devoted to environment problems and that people have learned the language of environmentalism, they have not simultaneously developed a commitment to the environment. It seems that residents are unaware of how their personal behaviour contributes to environmental degradation and therefore believe it is a problem for "someone else". Often they lack information as to what specific things they can do to contribute to environmental protection (Scott and Willits 1994).

   If this is true, what implications do you think this has in designing a educational component of a stewardship program?

3) The Environmental Awareness Survey indicated that confusion as to which environmental organization was most effective in protecting the environment. What is your interpretation to this response in terms of the CVC?

4) The Environmental Awareness Survey indicated that people were generally unwilling to give up a whole day to attend a symposium on land stewardship and environmental issues. Can you think of ways to get around this?

5) How would characterize the level of environmental knowledge of the people of the Town of Orangeville?

6) Page 8.1E in the Subwatershed 19 study is the implementation considerations for naturalization plans for valleyland corridors. In it, it suggests stewardship as one of the actions. Please suggest stewardship projects that you feel could be undertaken to fill this objective. Do not restrict yourself to the current conditions but also future possibilities.

Thank you for your time and ideas. This is a big help in fulfilment of my thesis

Steve Pennington, Return to srpennin@uoguelph.ca

Responses to questions asked of the CVC personnel

1) **Mike Pudister**

Response to Question 1:

- CVC Volunteer days could be more widely advertised in the Orangeville area
- Perhaps a workshop or open house could be held to inform the residents of some of the projects and/or issues that could benefit from citizen participation or assistance.

Response to Question 2:

- In the Orangeville area, groundwater is a major issue relate to supply. People in the Town need to be better informed on how much they depend on groundwater. Stewardship programs themselves should evolve from, or be the result of major education programs. People have to be convinced that they are connected to the environment around them. They have to realize that the quality of life that they are used to is very dependent on the relationship that they have with their environment (how do they treat their water supply; the Credit River and the tributaries?) The concepts of social marketing (McKenzie-Mohr) should be considered here in order to design an effective program.

Response to Question 3:

- Not surprised!! We have to do a better job at marketing ourselves!

Response to Question 4:

- I think that for most people evening meeting or workshops are probably the best. They should be local, and supported by local organizations that people know. They could be offered as part of a series at little, if any cost.

Response to Question 5:

- I would probably base my response on the survey. However, I believe generally, that they are probably as knowledgeable as other similar populations in Ontario.

Response to Question 6: I am not aware of site specific needs, and therefore would defer to Bob Morris and Jackie Thomas.

2) Bob Morris - Biologist

Response to Questions 1:

- Simplify messages.
- Thought that 40% of those surveyed that participated in community organizations was a high figure.
- Favours demonstration projects, hands on activities, and visual displays over newspaper articles.
- Work through existing organizations, Committee for the Beautification of Orangeville, Trout Unlimited, Canoe Club, North Peel Hunters and Anglers, etc.
- Currently, the CVC's approach to projects would be characteristics as opportunistic and reactionary.
- Some work done in local schools, but usually in an individual bases.
- Currently have a volunteer work day Callander, planning events is can be a problem.

Response to Question 2:

- Don't show that one persons actions can make a difference.
- Feedback is important, show tangible benefits.
- Must find out how the public measures success.
- Get people involved, i.e. like the lake monitoring program run by MNR in N.Ont.

Response to Question 3:

- Environmental issues are a complex topic due to the interrelationships.
- Legislative response has been layered, i.e. every time something new occurs an extra layer (or piece of legislation) is created.
- CVC's new message must be stressed - Leader in the protection of the environment in their jurisdiction, i.e. clean water in the Credit Valley Watershed.
- Must market themselves better.

Response to Question 4:

- 20 min evening sessions, in chunks people can swallow.
- Staff needs guidance on how best to present to the public (techniques).
- Public input on what they want to hear, package things around publicly identified issues
- Must diversify from the symposium approach, but still maintain close contact
- Don't preach to the converted
- Train other people in the community to spread word, Master Steward Program idea
- High burn out rate, therefore must maintain interest.

Response to Question 5:

- Expected higher than average do to rurality, and drinking water issues
- Will vary from place to place along watershed
- Younger more knowledgable

Response to Question 6:

- Must expand the number of facilitators for each BMP strategy
- Must re-evaluate each BMP from a stewardship perspective , with the public, to try and find different methods of achieving the goals
- Prioritizing of stewardship programs should come from the public
- Spread costs of achieving BMP goals over a large group of people, and attempt to lower the costs.
- Identify uses, and tie people to the resource
- Identify goals and objectives the public has for the resource
- Create a common vision

Current Structure of CVC:

- No dedicated outreach people by geographical area.
- Only planners are oriented geographically, they know the local communities best.
- Currently forming teams by task i.e. stewardship team.
- No local community stewardship council.
- Need to develop better access for the public, similar to rural beaches kiosk idea

3) **Mary Bracken - Planner**

Q1. Ways to access the community:

I'm sure you've thought of these, but here are a few ideas.

- how about through the kids...i.e. contact school teachers and see if it can be worked into the curriculum....or school events. This is also a good way to get information home....can even ask the principal if a notice can go in the school news letter.

- local newspaper

- target areas that people frequent such as grocery stores....can set up a display, etc.

- local community events.

Town staff may have some good suggestions in this regard. Alan Young, Director of Planning or Jack Tupling, Director of Public Works (also a local resident), Rick Schwarzer, CAO would be good contacts.

2. Designing education component:

I think any educational component has to be quick and simple. It also has to benefit people. For example, if we are promoting water conservation techniques like water saving toilet tanks....if people understand that it can save them money on their water bill, it might sell them on the idea. The benefits should be direct enough that they can appreciate them.

3. Environmental organization:

For those who know about the CVC, they have probably had an good or better still a very bad experience with the CVC. People have to deal with us through our regulation. Usually they don't like that. I have heard comments that we are too restrictive....you know...gov't regulations, etc. Recently, I was on a site walk for an environmental management plan for the lower Monora. We were on this one property and the owner came out to meet us. He said to us....another study..you people have studied this area to death..we don't need another study. Maybe he had a point....people need to see action happening. I think that is how we can grab their attention.

Most people, however, probably do not know what the CVC is. However, the name conservation probably gives them a pretty good idea.

The developers and consultants know who we are. They are probably a good source to target.

4. Symposium on land stewardship.

I don't think there is any way to get people to go out for a full day, unless you pay them. Although if it were more activity based, i.e. a hiking trip, then maybe they would come.

I think that we have to recognize that time is a valuable commodity. Maybe a few hours in the evening is all we can ask for.

Tying a symposium into an event may be more feasible, like a festival or other major community event.

Also, a stream clean up day may be a good way to get people out. The streams could use it!

5. Level of environmental knowledge of people of OV

I think, in general, they are as aware as any small urban centre. Some people have lived there all their lives and some own some beautiful properties. They seen to be more in touch. They also have a lot of valuable information that would be beneficial to share.

The awareness is mediocre, but I don't think it is worse that anywhere else in Ontario.

6. Stewardship opportunities.

Most of my dealings are with proposed developments. I think the developers are a key audience to target. Through their development proposals, we can implement some of the targets.

There are also some recently built areas where there has been some degradation to the watercourse corridors. For example, on Lower Monora Creek, some of the lots are close to the watercourse. Residents have

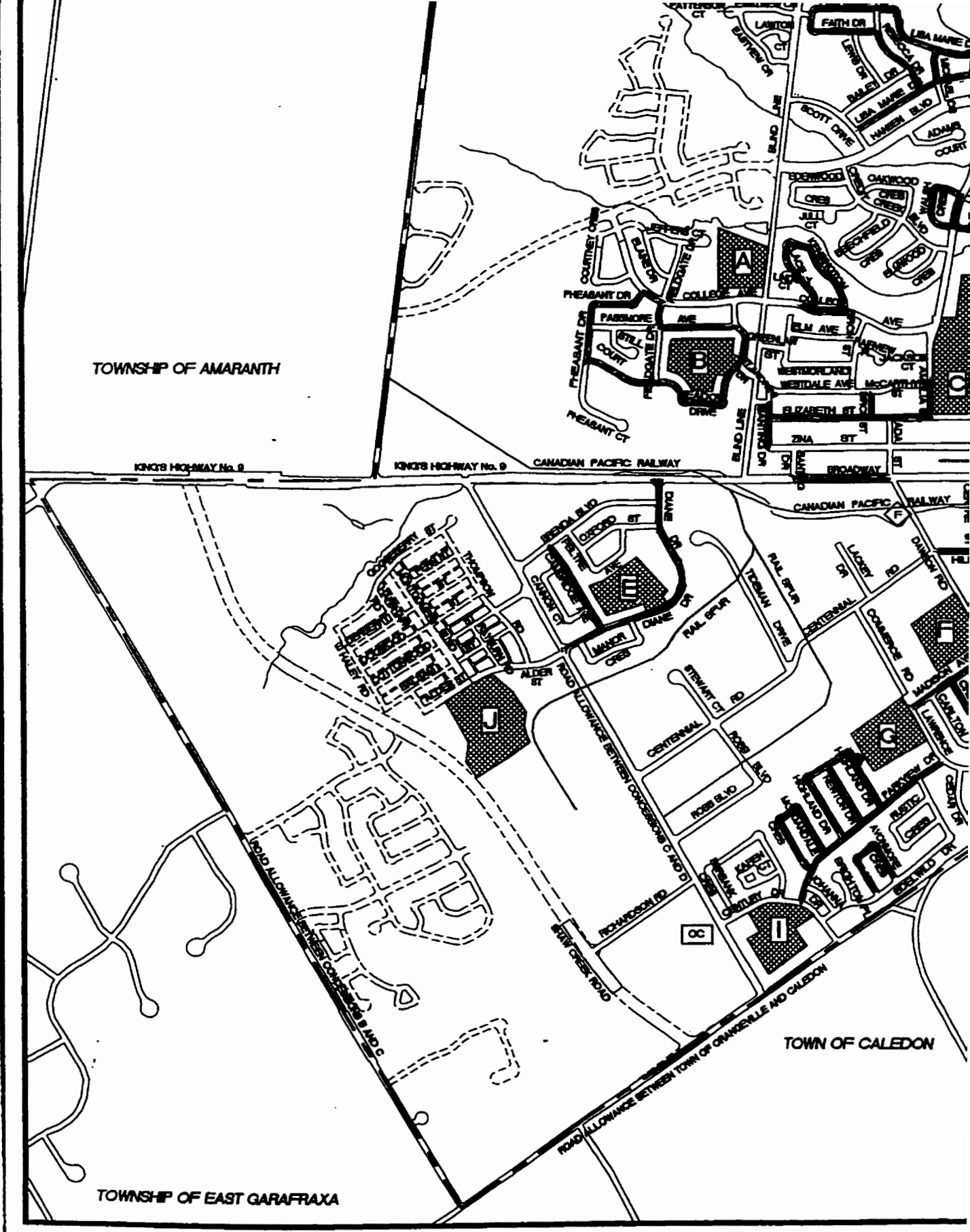
extended their usable lots down to the creek. This is also true for some of the older established neighbourhoods where the properties extend across creeks. This would be a key area to target. First of all, for those who own the creek, they have complete control on how they treat the banks, etc. These are also, for the most part, beautiful properties and you can tell that they take lots of pride in maintaining it. If they understood what they can do to benefit the creek i.e. leave natural vegetation for shading (benefit fisheries), use native species, etc., they would probably be willing to implement some of the practices. For those who encroach beyond their lot lines, first of all they are trespassing, and secondly, if they understood what impacts they are having on the corridor, then maybe they would stop. Along Lower Monora we saw where people are extending their gardens onto Town property, building tree forts, placing lawn furniture, clearing vegetation, placing stones to make the banks attractive, etc.

If I think of any more, I'll let you know.

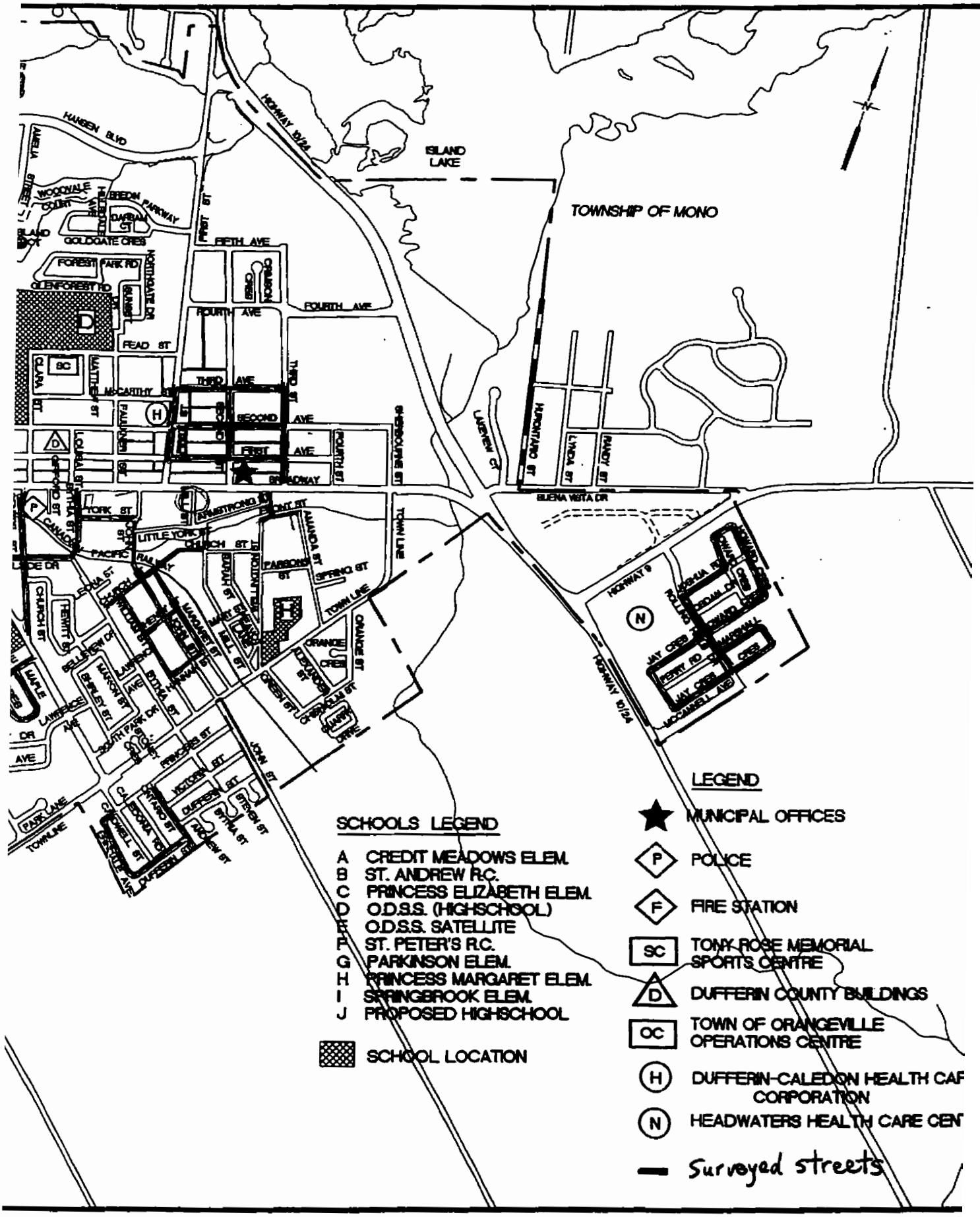
I hope this helps. If you have any questions, please call me. I do deal a lot with Orangeville (so does Jackie) and we've got all kinds of stories to tell.
My extension is 232. You probably know that we have a 1-800 phone # 668-5557.

Mary Bracken
Planner at CVC

Appendix D: Survey Package



TOWN OF ORANGE



SCHOOLS LEGEND

- A CREDIT MEADOWS ELEM.
- B ST. ANDREW R.C.
- C PRINCESS ELIZABETH ELEM.
- D O.D.S.S. (HIGHSCHOOL)
- E O.D.S.S. SATELLITE
- F ST. PETER'S R.C.
- G PARKINSON ELEM.
- H PRINCESS MARGARET ELEM.
- I SPRINGBROOK ELEM.
- J PROPOSED HIGHSCHOOL

SCHOOL LOCATION

LEGEND

- MUNICIPAL OFFICES
- (P) POLICE
- (F) FIRE STATION
- SC TONY ROSE MEMORIAL SPORTS CENTRE
- (D) DUFFERIN COUNTY BUILDINGS
- OC TOWN OF ORANGEVILLE OPERATIONS CENTRE
- (H) DUFFERIN-CALEDON HEALTH CAR CORPORATION
- (N) HEADWATERS HEALTH CARE CEN
- Surveyed streets

VILLE STREET MAP

DATE: JULY 19
DWG: 11X17.DW
XREF: 11X17BSE

Environmental Assessment Survey of Households in Orangeville

Survey #

1) Do you rent or own this house/property?_____(1)Rent_____(2)Own

2) What best describes your property's current use:

_____ (1) residential _____ (2) commercial _____(3) industrial
_____ (4) institutional_____ (5) recreational _____(6) agricultural
_____ (7)other (please specify): _____

3) How many years have you been at this residence/property? _____yrs

4) What is the size of your property? _____ x_____or _____ (area)

5) How many trees do you have on your property? _____

6) What is the average age of these trees? _____in years

7) Are your downspouts connected beneath the ground?____(1)Yes ___(2) No

8) Are you on a sanitary sewer or do you have a septic bed?

_____ (1)Sanitary sewer _____(2)Septic bed

9) In the summer, approximately how many times per week do you water your lawn? _____

10) What activities currently take place on your property? (if residential)

____ (1)Vegetable Garden _____ (2)Flower Garden
____ (3)Hobby Farm _____ (4)A pool
____ (5)Work Shop (auto, wood etc)_____(6)Other_____

11) Do you use fertilizers on your lawn or in your garden?___(1)Yes___(2) No

12) Do you use pesticides? ___ Yes ___No
If Yes; Where?___ (1)Lawn___ (2)Garden___(3)Trees___(4)Other_____

13) Do you own any cats or dogs?___(1) Dog___(2)Cat ___ No
a)Do you let your pet run freely or is it tied up/fenced in.___(1)Freely___(2)Tied up
b)If a dog: When you walk your dog do you clean up after it?___ (1)Yes___(2) No

14) Do you compost your garbage? ____ (1)Yes ____(2)No

15) Do you salt your porch, walkway, driveway, etc in the winter?
_____(1)Yes _____(2) No

16) What features are on your neighbouring properties?(Lands directly adjacent)
____(1)water ___(2) parkland/conservation area ____ (3) farmland
____(4)forests ___(5) industrial ____ (6) residential
____(7)other please specify _____

17) Are you involved in any community organizations?
_____

18) Are you or any member of your family involved in organizations affiliated with nature/wildlife/environmental issues?
_____(1)Yes _____(2)No Name of Organization: _____

19) If you were to join an (additional) environmental organization/club what type would it be? (may choose more than one)
(1) International/National (i.e. Sierra Club)
(2) Provincial size (i.e. Save the Carolinian Forest)
(3) Locally based (i.e. Friends of the Credit)
(4) A Hunting or Fishing Organization (i.e. local anglers assoc.)
(5) A Nature Group (Birdwatching)
(6) Other _____
(7) Would not join

20) Of the above list which environmental organization/level do you feel is most effective in protecting the environment. (may only choose 1)

21) Have you personally planted any trees on your property?__ (1)Yes _(2) No
If Yes: a) How many?_____
b) When did you plant them? _____
c) What kind of species did you plant? _____

22) Have you installed any water saving devices in your home?
_____ Yes ___No; What are they?_____

23) Do you recycle your garbage?
____ (1)Plastics _____ (2) Paper ____(3) Metal ____(4) Glass ____Nothing

24) How do you dispose of products such as motor oil and paint thinner?
_____

25) Do you have a bird feeder? _____ (1)Yes _____(2) No

26) Would you be interested in attracting more birds/butterflies to your home?
_____(1) Yes _____(2) No

27) Where does your municipal tap/drinking water originate from?
____ (1)groundwater/wells ____(2) rivers, lakes, etc ____(3)other

28) Do you let the water run in order to get it cold for drinking, etc?
_____(1)Yes____(2) No

29) In which watershed is your property located?_____

30) Which Conservation Authority's jurisdiction covers your area?_____

31) Please tell us the top 5 environmental issues that concern you.
___(1) waste disposal/landfill site ___(2) global warming/climate change
___(3) ozone depletion ___(4) water quality concerns
___(5) air quality concerns ___(6) wetland preservation
___(7) deforestation ___(10) overpopulation
___(11) acid precipitation ___(12) toxic waste/nuclear facilities
___(13) loss of wildlife habitats ___(14) loss of species diversity
___(15) other _____

32) Which creeks/rivers are you familiar with that flow through town?_____
If yes; Are there any problems with any of these creeks, and if so what _____

33) Do you use the Credit River or any of its tributaries for any of the following recreational activities?
_____ (1) canoeing ____(2) fishing _____(3) walking/running/hiking
_____ (4) picnicking ____(5) skiing _____(6) bird watching/nature appreciation /photography
_____ (7) swimming ____(10) snowmobiling ____(11) other (specify)_____
_____ (12) Doesn't use at all

34) Do you feel that the presence of wildlife is a problem or an asset in urban areas? ___(1)problem__(2)Asset
Please give an example. _____

35) If an environmental accident were to occur in your neighbourhood, whom would you contact?_____

36) Would you be interested in making your property and the public lands around you more environmentally friendly? ___(1)Yes__(2)No

37) Would you be interested in attending an all day workshop/symposium on on private land stewardship/environmental issues? ___(1)Yes__(2)No

Professionals in stream management believe that a vegetated buffer zone around creeks is an important factor in maintaining the health of the whole river system. Some benefits they see of a buffered stream corridor include:

- reduced flooding
- improved water quality
- provides wildlife habitat
- provides areas for recreation

reduced erosion
buffer external impacts
enhanced visual aesthetics
reduced water temperatures (shade; improves fish habitat)

38) ***We are interested in your point of view....*** Do you think that if buffers were established along the sections of the creek nearest to you that they would provide any of the benefits mentioned above?

Benefits	Not at all improved	A little improved	A lot improved
• (65) reduced erosion	1	2	3
• (66) reduced flooding	1	2	3
• (67) improved water quality	1	2	3
• (68) provide wildlife habitat	1	2	3
• (69) enhance visual aesthetics	1	2	3
• (70) provide recreational opp.	1	2	3
• (71) reduce water temperature	1	2	3
• (72) buffer external impacts	1	2	3

39) If your neighbours agreed to establish a buffer zone on the creek nearest you, what would motivate you to participate? Please choose all the items that would influence you.

____ (1) nothing (I would not participate)
____ (2) maintain property values $
____ (3) property rights were maintained
____ (4) if there was a restrictions on trespassing
____ (5) increased visual aesthetics
____ (6) reduced flooding
____ (7) reduced erosion
____ (8) improved water quality
____ (9) increased wildlife habitat
____ (10)increased recreational opportunities
____ (11) improved fish habitat
____ (12) other (please specify) _____

40) Gender: _____ (1) Male _____ (2) Female

41) With in a five year range ; What is your age range?

(Please circle):Age in years (1) < 13; (2) 14 - 19; (3) 20 - 24; (4) 25 - 29; (5) 30 - 34; (6) 35 - 39; (7) 40 - 44; (10) 45 - 49; (11) 50 - 54; (12) 55 - 59; (13) 60 - 64; (14) 65 - 69; (15) 70+

42) How many people live in your household? _____

43) What was the last school you attended? (check one)

_____ (1)Elementary_____(2)High School_____(3)College/Post____(4)University
Secondary/
Adult Ed

44) What is your present occupation? (Include student, retired, & homemaker)
(Please check one)

___(1) Clerical and Related Occupations
(Typist, telephone operator, receptionist, filing clerk, bookkeeper)

___(2) Sales Occupations (sales clerk, agent, deliverer, etc)

___(3) Service Occupations (police, cook, floor cleaner)

___(4) Farming, Fishing, Forestry, Environmental, Logging, Mining, and Quarrying Occupations

___(5) Production Process and Related Occupations (assembler, moulder, machine tender, lathe operator etc.)

___(6) Construction Trades Occupations

___(7) Transportation and Other equipment Operating and Materials Handling Occupations (Truck driver, pilot, parcel carrier, etc)

___(8) Teaching and Related Occupations (school teacher, trade instructor, driving instructor, etc)

___(9) Scientific and Technical Occupations (medical doctor, computers, nurse, civil engineer, etc)

___(10) Social Sciences and Artistic Occupations (social worker, lawyer, economist, writer, artist)

___(11) Managerial and Administrative Occupations (president, accountant, bank manager, personnel manager)

___(12) Retired _____ (13) Homemaker _____(14) Student

___(15) Other, Please Specify _____

45) **With in a $20,000 range; What is your household income?** (add income from all adult sources) • 94

_____ (1) under 40,000 _____ (2) $40,000 - $79,999

_____ (3) $80,000 +

46) **Do you have Internet access either at home or somewhere else locally?** • 95

_____ Yes ___ No

47) **Do read either the Orangeville Banner or The Orangeville Citizen on a regular or semi-regular bases?** _____(1) O.B. _____(2) TOC • •

If yes: How frequently? X____/wk X_____/wk • •

Mill Creek Survey

1) Do you derive any personal enjoyment/satisfaction from living close to Mill Creek?

1	2	3
None	a little	a lot

• 98

2) Do you feel that your property's proximity to Mill Creek enhances its value?

1	2	3
Not at all	somewhat	a lot

• 99

3) How would you rate the environmental state/health of Mill Creek? (i.e. aesthetically, pollution etc.)

1	2	3	4	5
Very poor	poor	good	very good	excellent

• 100

4) If your local community was organizing either a stream bank tree planting project or a clean up effort, would you volunteer to participate?

(1) Yes (2) No

• 101

Helpful Question Page

19) If you were to join an (additional) environmental organization/club what type would it be?

(may choose more than one)

(1) International/National (i.e. Sierra Club)
(2) Provincial size (i.e. Save the Carolinian Forest)
(3) Locally based (i.e. Friends of the Credit)
(4) A Hunting or Fishing Organization (i.e. local anglers assoc.)
(5) A Nature Group (Birdwatching)
(6) Other _____
(7) Would not join

20) Of the above list which environmental organization/level do you feel is most effective in protecting the environment. (may only choose 1)

31) Please tell us the top 5 environmental issues that concern you. (you don't need to rank them)

_____ waste disposal/landfill site
_____ ozone depletion
_____ air quality concerns
_____ deforestation
_____ acid precipitation
_____ loss of wildlife habitat
_____ other _____
_____ global warming/climate change
_____ water quality concerns
_____ wetland preservation
_____ overpopulation
_____ toxic waste/nuclear facilities
_____ loss of species diversity

33) Do you use the Credit River or any of its tributaries for any of the following recreational activiti

_____ canoeing _____ fishing _____ walking/running/hiking
_____ picnicking _____ skiing _____ bird watching/nature appreciation
_____ swimming _____ snowmobiling ____ do not use at all
_____ other (please specify) _____

Buffers

Professionals in stream management believe that a vegetated buffer zone around creeks is an important factor maintaining the health of the whole river system. Some benefits they see of a buffered stream corridor include

- reduced flooding
- improved water quality
- provides wildlife habitat
- provides areas for recreation
- reduced erosion
- buffer external impacts
- enhanced visual aesthetics
- reduced water temperatures (shade; improves fish habitat)

38) ***We are interested in your point of view....*** If a buffer were to be established along the section of the cre nearest to you, do you think it would improve the creek in any of the following ways?:

Benefits	Not at all improved	A little improved	A lot improved
• reduced erosion	1	2	3
• reduced flooding	1	2	3
• improved water quality	1	2	3
• provide wildlife habitat	1	2	3
• enhance visual aesthetics	1	2	3
• provide recreational opportunities	1	2	3
• reduce water temperature	1	2	3
• buffer external impacts	1	2	3

39) **If your neighbours agreed to establish buffer zones on the local creek what would motivate you participate? Please choose all the items that would influence you.**

____ (1) nothing (I would not participate)
____ (2)maintain property values $
____ (3) assurances that property rights were maintained
____ (4)If there was a restrictions on trespassing
____ (5) increased visual aesthetics
____ (6) reduced flooding
____ (7) reduced erosion
____ (8) improved water quality
____ (9) increased wildlife habitat (not including fish)
____ (10)increased recreational opportunities
____ (11) improved fish habitat
____ (12) other (please specify) _____

Definitions

With regard to Buffers:

Buffer external impacts: Think of a parking lot being adjacent to a stream/river. An established buffer woul protect the stream from the garbage, sand & salt, and other possible intrusions.

Reduced erosion: Planting of vegetation along the edge of the river/creek reduces erosion

Reduces water temperature: Shade from the mature vegetation reduces water temperature which is conduci to fish habitat.

Property values: There is a direct correlation between green space and property values

Property rights are maintained: Beyond trespassing, this refers to the concern that the person will maintain ownership of the property but have agreed to participate in environmental initiatives with his neighbours.

Trespassing: There would be a restriction on trespassing despite the linear buffer that might bisect their property.

Environmental Assessment Survey - Key

Q1S2 Property ownership

1 Rent
2 Own

Q2S3A Current Property Uses
Q2S3B

1 Residential
2 Commercial
3 Industrial
4 Institutional
5 Recreational
6 Agricultural
7 Other

may select more than one

Q3S4 Number of Years at this residence

1 - 99 years

Q4S5 Size of Property in Square Feet

1 - 999,999 ft^2

1 ac = 43,5600 ft^2 or 210 ft X 210 ft

Q5S6 Number of Trees on Property

1 - 999

Q6S7 Average Age of Trees on Property

1 - 99 years

Q7S8 Are the Downspouts Beneath the Ground?

1 Yes
2 No

Q8S9 Sanitary Sewer/Septic Bed

1 Sanitary Sewer
2 Septic Bed
3 Did not Know

Q9S10 No. Of Time/wk water lawn in Summer?

1 -10

Q10 Current Activities on Property

S11 0 Nothing (place holder)
1 Vegetable Garden

S12 0 Nothing (place holder)
2 Flower Garden

S13 0 Nothing (place holder)
3 Hobby Farm

S14 0 Nothing (place holder)
4 Pool

S15 0 Nothing (place holder)
5 Work Shop

S16 0 Nothing (place holder)
6 Other

Q11S18 Use of Fertilizers on Lawn/Garden

1 Yes 2 No

Q12S18 Use of Pesticides

0000 - Do Not Use
1000 - lawn only
1200 - lawn and garden
1030 - lawn and trees
1004 - lawn and other
1230 - lawn & garden & trees
1234 - L & G & T & other
0200 - garden only
0230 - garden and trees
0234 - G & T & other
0030 - trees only
0034 - trees and other
0004 - other only

8 Not Applicable **9 No Response**

for all Questions

Q13 Ownership of a Cat/Dog

S19 0 neither
1 Dog
2 Cat

S20 1 Run Freely
2 Tied up/Fenced in

S21 Pop and Scoop

1 Yes
2 No

Q14S22 Compost Garbage?

1 Yes
2 No

Q15S23 Salt Driveway?

1 Yes 2 No
3 Use alternatives

Q16 Features on neighbouring properties

S24 0 Nothing (place holder)
1 Water
S25 0 Nothing (place holder)
2 Park/Conservation Area
S26 0 Nothing (place holder)
3 Farmland
S27 0 Nothing (place holder)
4 Forest
S28 0 Nothing (place holder)
5 Industrial
S29 0 Nothing (place holder)
6 Residential
S30 0 Nothing (place holder)
7 other

Q17S31 Membership in Community Org.

0 Not a member any Organization
1 Yes, but don't know which one
2 Church (including youth groups)
3 Cubs, Scouts, Guides, Browns, etc.
4 Minor Sports Org. (Hockey, Baseball etc.)
5 Service Organization
i.e. Optimists
Rotary Club
K of C
Lions, etc.
6 Nature Organization (specify #18)
7 Charity Organizations
i.e. Terry Fox Run
Red Cross
Habitat For Humanity
10 Social Clubs
i.e. Bridge
Skiing
Square Dancing,etc.
11 Cultural Groups
i.e. Theatre Orangeville
Book Clubs,
Historical Orangeville, etc.

Q18S32 Nature/Environmental Affiliation

0 Not a member of any nature org.
1 Dufferin Naturalists
2 Horticultural Society
3 Other Local Nature group/ Birdwatching/Hiking
4 Hunting/ Fishing Clubs
5 Local nature sports group, snowmobiling, canoeing, etc.
6 Through a school
7 Local Gov. Environmental, EEAC, Waste Mgmt Board.
10 Local environment group/ Keepers of the Earth
11 Provincial Level Org. (Save the Carolinian Forests)
12 International/Greenpeace/WWF

Q19S33 Type of Environmental Org. They would join.

000000 Would not join
100000 International only
120000 Int. & Prov.
123000 Int. & Prov. & Local
123400 I&P&L& Hunting etc.
123450 I&P&L&H& Nature Group
123456 I&P&L&H&N& Other
020000 Provincial Only
023000 Prov. & Local
023400 P&L& Hunting
023450 P&L&H& Nature
023456 I&P&L&H&N& Other
003000 Local Only
003400 Local & Hunting
003450 L&H& Nature
003456 I&P&L&H&N & Other
000400 Hunting & Fishing Only
000450 H& Nature Groups
000456 H&N& Other
000050 Nature Group only
000056 Nature & Other
000006 Other Only

Q20S34 Most effective Enviro. Org.
1 International/National (i.e. Sierra Club)
2 Provincial Size (Save the Carolinian For.)
3 Locally based (i.e Friends of the Credit)
4 Hunting & Fishing Org.
5 Nature Groups (birdwatching)
6 Other

Q21 Planted trees on the property?
S35 1 Yes 2 No
S36 How many?
1 - 999
S37 Years ago Planted?
1 - 99

S38A 1 Spruce 7 Maple
S38B 2 Pine 10 Walnut
S38C 3 Cedar 11 Fruit
4 Willow 12 Mulberry
5 Birch 13 other
6 lilac (only choose one)

Q22S39 Water Saving Devices
(Same idea as Q33)

1 or 0 Shower head
2 or 0 Toilets/Toilet Dams
3 or 0 Taps
4 or 0 Appliances (Dishwasher)
5 or 0 Heater coat
6 or 0 Other
(Must choose the No. or 0, order is important)

Q23S40 Recycle
(as above)
0000 Nothing
1 or 0 Plastics
2 or 0 Paper
3 or 0 Metal
4 or 0 Glass

Q24S41 Disposal of Hazardous Goods

1 Take to Dump/Special Day
2 Put in Garbage
3 Pour down sink/toilet
4 Pour down sewer
5 Burn
6 Other

Q25S42 Bird Feeder

1 Yes 2 No

Q26S43 Interest in attracting Birds

1 Yes 2 No

Q27S44 Origin of Tap water

1 groundwater/wells
2 rivers, lake, etc
3 other
4 Did not know

Q28S45 Let water run
1 Yes 2 No

8 Not Applicable **9 No Response**

for all Questions

Q29S46 Which Watershed?

1 Credit Valley
2 Dufferin
3 Nottawasauga
4 Mill Creek
5 Menora Creek
6 Did not Know

Q30S47 Conservation Authority

1 Credit Valley Conservation
2 Nottawassauga Conservation
3 Niagara Escarpment
4 Grand River CA
5 Other
6 Do Not Know

Q31 S48, S49, S50, S51, S52
Top 5 Environmental Issues

(1) waste disposal/landfill site
(2) global warming/climate change
(3) ozone depletion
(4) water quality concerns
(5) air quality concerns
(6) wetland preservation
(7) deforestation
(10) overpopulation
(11) acid precipitation
(12) toxic waste/nuclear facilities
(13) loss of wildlife habitats
(14) loss of species diversity
(15) other _____

(Choose Five of the above)

Q32S53 Knowledge of local Creeks/Rivers

00 None
01 Credit River only
02 Mill Creek/ John St. Creek
03 Nottawassauga River
04 Menora Creek
(any combination of two above, in order)
05 3 or more of the above

Q33 Activities on the Credit River

S54 1 or 0 canoeing
S55 2 or 0 fishing
S56 3 or 0 walking/running/hiking
S57 4 or 0 picnicking
S58 5 or 0 skiing
S59 6 or 0 bird watching/nature appreciation/photography
S60 7 or 0 swimming
S61 10 or 0 snowmobiling
S62 11 or 0 other
S63 12 or 0 Doesn't use at all

Q34 Wildlife Problem/Asset

S64 1 Problem
2 Asset

S65 (examples)
1 Asthetically Pleasing
2 Education/ Knowledge/ Appreciation of Wildlife
3 Get in Garbage
4 Rabies
5 Attack of children
6 other

Q35S66 Environmental Emergency

1 City Hall
2 Police
3 Fire Department
4 CVC
5 MNR
6 MOEE
7 Other

Q36S67 Property more environmentally friendly

1 Yes 2 No

Q37S68 Workshop/Symposium?
1 Yes 2 No

Q38 S69 - S76 Buffers

1 Not at all improved
2 A little Improved
3 A lot improved

Q39 Motivation for Buffers

S77 1 or 0 (would not participate)
S78 2 or 0 maintain property values $
S79 3 or 0 property rights maintained
S80 4 or 0 restrictions on trespassing
S81 5 or 0 increased visual aesthetics
S82 6 or 0 reduced flooding
S83 7 or 0 reduced erosion
S84 10 or 0 improved water quality
S85 11 or 0 increased wildlife habitat
S86 12 or 0 increased recreational opp.
S87 13 or 0 improved fish habitat
S88 14 or 0 other
(Note: Numbering is Different from Survey)

Q40S89 Gender
1 Male 2 Female

Q41S90 Age

(1) < 13; (7) 40 - 44;
(2) 14 - 19; (10) 45 - 49;
(3) 20 - 24; (11) 50 - 54;
(4) 25 - 29; (12) 55 - 59;
(5) 30 - 34; (13) 60 - 64;
(6) 35 - 39; (14) 65 - 69;
(15) 70+

Q42S91 No. Of people in House

1 - 99

Q43S92 Last School Attended
1 Elementary
2 High School
3 College/Post Secondary/ Adult Ed
4 University

Q44S93 Employment

1 Clerical and Related Occupations (Typist, telephone operator, receptionist, filing clerk)

2 Sales Occupations (sales clerk, agent, deliverer, etc)

3 Service Occupations (police, cook, floor cleaner)

4 Farming, Fishing, Forestry, Environmental, Logging, Mining, and Quarrying Occupations

5 Production Process and Related Occupations (assembler, moulder, machinetender, lathee operator)

6 Construction Trades Occupations

7 Transportation and Other equipment Operating and Materials Handling Occupations (Truck driver, pilot, par carrier, etc)

10 Teaching and Related Occupations (school teacher, trade instructor, driving instructor, etc)

11 Scientific and Technical Occupations (medical docto computers, nurse, civil engineer, etc)

12 Social Sciences and Artistic Occupations (social worker, lawyer, economist, writer, artist)

13 Managerial and Administrative Occupations (president, accountant, bank manager, personnel manager)

14 Retired
15 Homemaker
16 Student
17 Other

Q45S94 Income
1 Under 40,000
2 40,000 - 79,000
3 80,000 +

Q46S95 Internet Access
1 Yes 2 No

Q47 Banner/Citizen
S96 11 Banner once a week
12 Banner 2x a week
00 Do not read
S47 21 Citizen once a week
00 Do not read

8 Not Applicable **9 No Response**

for all Questions

QM1S98 Enjoyment of Mill Creek

1 None 2 A little 3 A lot

QM2S99 Enhances Value

1 Not at All 2 Somewhat 3 A Lot

QM3S100 State of Environment

1	very poor	4	very good
2	poor	5	excellent
3	good		

QM4S101 Volunteer

1 Yes 2 No

Appendix E: Survey Data and Statistics

All survey results in tabular form regarding urban private landowner stewardship in Orangeville

• Q1S2 **Property Owners**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Rent	1	31	11.1	11.1	11.1
Own	2	248	88.6	88.6	99.6
No Response	9	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q2S3A **Current Property Uses**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Residential	1	276	98.6	98.6	98.6
Commercial	2	1	.4	.4	98.9
Not Applicable	8	1	.4	.4	99.3
No Response	9	2	.7	.7	100.0
	Total	280	100.0	100.0	

• Q2S3B **Current Property Uses**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Residential	1	1	.4	.4	.4
Commercial	2	7	2.5	2.5	2.9
Industrial	3	2	.7	.7	3.6
Recreational	5	1	.4	.4	3.9
Other	7	2	.7	.7	4.6
Not Applicable	8	267	95.4	95.4	100.0
	Total	280	100.0	100.0	

• Q3S4 **No. of Years at this residence**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.02	2	.7	.7	.7
	.20	1	.4	.4	1.1
	.25	3	1.1	1.1	2.1
	.40	1	.4	.4	2.5
	.50	11	3.9	3.9	6.4
	.60	1	.4	.4	6.8
	.75	1	.4	.4	7.1
	.80	1	.4	.4	7.5
	1.00	26	9.3	9.3	16.8
	1.50	7	2.5	2.5	19.3
	2.00	27	9.6	9.6	28.9
	2.50	4	1.4	1.4	30.4
	3.00	19	6.8	6.8	37.1
	4.00	13	4.6	4.6	41.8
	4.50	1	.4	.4	42.1
	5.00	24	8.6	8.6	50.7
	6.00	18	6.4	6.4	57.1
	7.00	24	8.6	8.6	65.7
	7.50	1	.4	.4	66.1
	7.99	3	1.1	1.1	67.1
Not Applicable	8.00	8	2.9	2.9	70.0

• Q3S4 **No. of Years at this residence continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Response	9.00	6	2.1	2.1	72.1
	9.01	2	.7	.7	72.9
	10.00	16	5.7	5.7	78.6
	11.00	5	1.8	1.8	80.4
	11.50	1	.4	.4	80.7
	12.00	8	2.9	2.9	83.6
	13.00	5	1.8	1.8	85.4
	14.00	4	1.4	1.4	86.8
	15.00	7	2.5	2.5	89.3
	16.00	4	1.4	1.4	90.7
	17.00	1	.4	.4	91.1
	18.00	5	1.8	1.8	92.9
	19.00	1	.4	.4	93.2
	20.00	5	1.8	1.8	95.0
	21.00	1	.4	.4	95.4
	22.00	2	.7	.7	96.1
	23.00	2	.7	.7	96.8
	24.00	1	.4	.4	97.1
	26.00	1	.4	.4	97.5
	27.00	1	.4	.4	97.9
	30.00	3	1.1	1.1	98.9
	34.00	1	.4	.4	99.3
	35.00	1	.4	.4	99.6
	41.00	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q4S5 **Size of Property in Square Feet**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No Response	9.00	49	17.5	17.5	17.5
	625.00	1	.4	.4	17.9
	720.00	1	.4	.4	18.2
	1000.00	1	.4	.4	18.6
	1125.00	1	.4	.4	18.9
	1185.00	1	.4	.4	19.3
	1200.00	2	.7	.7	20.0
	1250.00	1	.4	.4	20.4
	1300.00	1	.4	.4	20.7
	1500.00	1	.4	.4	21.1
	1752.00	1	.4	.4	21.4
	2000.00	1	.4	.4	21.8
	2400.00	2	.7	.7	22.5
	2432.00	1	.4	.4	22.9
	2530.00	1	.4	.4	23.2
	2880.00	1	.4	.4	23.6
	3000.00	5	1.8	1.8	25.4
	3125.00	1	.4	.4	25.7
	3200.00	2	.7	.7	26.4
	3267.00	1	.4	.4	26.8
	3268.00	1	.4	.4	27.1
	3300.00	1	.4	.4	27.5
	3500.00	1	.4	.4	27.9
	3600.00	6	2.1	2.1	30.0
	3750.00	3	1.1	1.1	31.1
	3828.00	1	.4	.4	31.4
	4000.00	4	1.4	1.4	32.9
	4025.00	2	.7	.7	33.6

• Q455 **Size of Property in Square Feet continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4200.00	1	.4	.4	33.9
	4400.00	4	1.4	1.4	35.4
	4500.00	6	2.1	2.1	37.5
	4600.00	1	.4	.4	37.9
	4800.00	7	2.5	2.5	40.4
	4884.00	1	.4	.4	40.7
	4900.00	1	.4	.4	41.1
	4950.00	2	.7	.7	41.8
	5000.00	19	6.8	6.8	48.6
	5150.00	1	.4	.4	48.9
	5200.00	1	.4	.4	49.3
	5280.00	1	.4	.4	49.6
	5300.00	1	.4	.4	50.0
	5400.00	3	1.1	1.1	51.1
	5500.00	8	2.9	2.9	53.9
	5625.00	1	.4	.4	54.3
	5750.00	1	.4	.4	54.6
	5775.00	2	.7	.7	55.4
	5808.00	1	.4	.4	55.7
	5830.00	1	.4	.4	56.1
	6000.00	14	5.0	5.0	61.1
	6050.00	1	.4	.4	61.4
	6250.00	1	.4	.4	61.8
	6254.00	1	.4	.4	62.1
	6300.00	2	.7	.7	62.9
	6325.00	1	.4	.4	63.2
	6384.00	1	.4	.4	63.6
	6400.00	1	.4	.4	63.9
	6420.00	1	.4	.4	64.3
	6500.00	3	1.1	1.1	65.4
	6600.00	5	1.8	1.8	67.1
	6680.00	1	.4	.4	67.5
	6900.00	3	1.1	1.1	68.6
	7000.00	5	1.8	1.8	70.4
	7100.00	1	.4	.4	70.7
	7150.00	2	.7	.7	71.4
	7200.00	3	1.1	1.1	72.5
	7275.00	1	.4	.4	72.9
	7351.00	1	.4	.4	73.2
	7410.00	1	.4	.4	73.6
	7440.00	1	.4	.4	73.9
	7500.00	2	.7	.7	74.6
	7590.00	1	.4	.4	75.0
	7656.00	1	.4	.4	75.4
	7800.00	3	1.1	1.1	76.4
	7920.00	1	.4	.4	76.8
	8000.00	3	1.1	1.1	77.9
	8050.00	1	.4	.4	78.2
	8100.00	3	1.1	1.1	79.3
	8125.00	1	.4	.4	79.6
	8579.00	1	.4	.4	80.0
	8700.00	1	.4	.4	80.4
	8800.00	1	.4	.4	80.7
	8821.00	1	.4	.4	81.1
	8855.00	1	.4	.4	81.4
	8910.00	1	.4	.4	81.8
	9000.00	3	1.1	1.1	82.9
	9100.00	1	.4	.4	83.2

• Q4S5 **Size of Property in Square Feet continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	9600.00	1	.4	.4	83.6
	9750.00	2	.7	.7	84.3
	9801.00	1	.4	.4	84.6
	10000.00	2	.7	.7	85.4
	10425.00	1	.4	.4	85.7
	10600.00	1	.4	.4	86.1
	10780.00	1	.4	.4	86.4
	10790.00	1	.4	.4	86.8
	10800.00	1	.4	.4	87.1
	10890.00	2	.7	.7	87.9
	11880.00	1	.4	.4	88.2
	12000.00	1	.4	.4	88.6
	12045.00	1	.4	.4	88.9
	12300.00	1	.4	.4	89.3
	12474.00	1	.4	.4	89.6
	12800.00	1	.4	.4	90.0
	13068.00	1	.4	.4	90.4
	13264.00	1	.4	.4	90.7
	13600.00	1	.4	.4	91.1
	14520.00	1	.4	.4	91.4
	15620.00	1	.4	.4	91.8
	21780.00	2	.7	.7	92.5
	22000.00	1	.4	.4	92.9
	23760.00	1	.4	.4	93.2
	32670.00	1	.4	.4	93.6
	43560.00	1	.4	.4	93.9
	50110.00	2	.7	.7	94.6
	50120.00	2	.7	.7	95.4
	50150.00	1	.4	.4	95.7
	55130.00	1	.4	.4	96.1
	60120.00	1	.4	.4	96.4
	60150.00	1	.4	.4	96.8
	65110.00	1	.4	.4	97.1
	65340.00	1	.4	.4	97.5
	66100.00	1	.4	.4	97.9
	66132.00	1	.4	.4	98.2
	80140.00	1	.4	.4	98.6
	85100.00	1	.4	.4	98.9
	100200.00	1	.4	.4	99.3
	200200.00	1	.4	.4	99.6
	999999.00	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q5S6 **Number of Trees on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	11	3.9	3.9	3.9
	1	20	7.1	7.1	11.1
	2	28	10.0	10.0	21.1
	3	26	9.3	9.3	30.4
	4	28	10.0	10.0	40.4
	5	26	9.3	9.3	49.6
	6	17	6.1	6.1	55.7
	7	1	.4	.4	56.1
	7	23	8.2	8.2	64.3
Not Applicable	8	6	2.1	2.1	66.4
No Response	9	18	6.4	6.4	72.9

• Q5S6 **Number of Trees on Property continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	10	19	6.8	6.8	79.6
	11	1	.4	.4	80.0
	12	10	3.6	3.6	83.6
	13	4	1.4	1.4	85.0
	14	4	1.4	1.4	86.4
	15	6	2.1	2.1	88.6
	16	3	1.1	1.1	89.6
	18	3	1.1	1.1	90.7
	19	2	.7	.7	91.4
	20	9	3.2	3.2	94.6
	22	1	.4	.4	95.0
	23	1	.4	.4	95.4
	24	2	.7	.7	96.1
	26	1	.4	.4	96.4
	28	1	.4	.4	96.8
	30	3	1.1	1.1	97.9
	33	1	.4	.4	98.2
	40	2	.7	.7	98.9
	200	1	.4	.4	99.3
	350	1	.4	.4	99.6
	7500	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q6S7 **Average Age of Trees on Property in Year**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	1	.4	.4	.4
	.50	1	.4	.4	.7
	.75	1	.4	.4	1.1
	1.00	7	2.5	2.5	3.6
	2.00	15	5.4	5.4	8.9
	3.00	13	4.6	4.6	13.6
	4.00	12	4.3	4.3	17.9
	5.00	14	5.0	5.0	22.9
	6.00	14	5.0	5.0	27.9
	6.50	1	.4	.4	28.2
	7.00	15	5.4	5.4	33.6
	7.50	2	.7	.7	34.3
	7.99	1	.4	.4	34.6
Not Applicable	8.00	17	6.1	6.1	40.7
No Response	9.00	21	7.5	7.5	48.2
	10.00	30	10.7	10.7	58.9
	12.00	8	2.9	2.9	61.8
	13.00	3	1.1	1.1	62.9
	14.00	2	.7	.7	63.6
	15.00	23	8.2	8.2	71.8
	17.00	1	.4	.4	72.1
	18.00	2	.7	.7	72.9
	20.00	27	9.6	9.6	82.5
	21.00	1	.4	.4	82.9
	22.00	1	.4	.4	83.2
	23.00	1	.4	.4	83.6
	25.00	15	5.4	5.4	88.9
	28.00	1	.4	.4	89.3
	30.00	10	3.6	3.6	92.9
	35.00	1	.4	.4	93.2
	40.00	4	1.4	1.4	94.6

• Q6S7 **Average Age of Trees on Property in Year continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	50.00	7	2.5	2.5	97.1
	55.00	1	.4	.4	97.5
	65.00	1	.4	.4	97.9
	75.00	2	.7	.7	98.6
	90.00	1	.4	.4	98.9
	99.00	2	.7	.7	99.6
	100.00	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q7S8 **Are the Downspouts Beneath the Ground?**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	35	12.5	12.5	12.5
No	2	230	82.1	82.1	94.6
No Response	9	15	5.4	5.4	100.0
	Total	280	100.0	100.0	

• Q8S9 **Sanitary Sewer/Septic Bed**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Sanitary	1	270	96.4	96.4	96.4
Septic	2	5	1.8	1.8	98.2
Did not Know	3	1	.4	.4	98.6
No Response	9	4	1.4	1.4	100.0
	Total	280	100.0	100.0	

• Q9S10 **No. Of Time/wk water lawn in Summer?**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	39	13.9	13.9	13.9
	.17	1	.4	.4	14.3
	.25	6	2.1	2.1	16.4
	.50	8	2.9	2.9	19.3
	1.00	85	30.4	30.4	49.6
	1.50	2	.7	.7	50.4
	2.00	67	23.9	23.9	74.3
	2.50	3	1.1	1.1	75.4
	3.00	25	8.9	8.9	84.3
	4.00	10	3.6	3.6	87.9
	5.00	3	1.1	1.1	88.9
	8.00	4	1.4	1.4	90.4
No Response	9.00	25	8.9	8.9	99.3
	10.00	1	.4	.4	99.6
	21.00	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q10S11 **Current Activities on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	182	65.0	65.0	65.0
Vegetable Garden	1	98	35.0	35.0	100.0
	Total	280	100.0	100.0	

•• Q10S12 **Current Activities on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	39	13.9	13.9	13.9
Flower Garden	2	241	86.1	86.1	100.0
	Total	280	100.0	100.0	

•• Q10S13 **Current Activities on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	278	99.3	99.3	99.3
Hobby Farm	3	2	.7	.7	100.0
	Total	280	100.0	100.0	

•• Q10S14 **Current Activities on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	244	87.1	87.1	87.1
Pool	4	36	12.9	12.9	100.0
	Total	280	100.0	100.0	

•• Q10S15 **Current Activities on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	250	89.3	89.3	89.3
Work Shop	5	30	10.7	10.7	100.0
	Total	280	100.0	100.0	

• Q10S16 **Current Activities on Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	270	96.4	96.4	96.4
Other	6	10	3.6	3.6	100.0
	Total	280	100.0	100.0	

• Q11S17 **Use of Fertilizers on Lawn/Garden**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	205	73.2	73.2	73.2
No	2	73	26.1	26.1	99.3
No response	9	2	.7	.7	100.0
	Total	280	100.0	100.0	

• Q12S18 **Use of Pesticides**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Do Not use	0	161	57.5	57.5	57.5
Lawn only	1000	52	18.6	18.6	76.1
Lawn and Trees	1030	9	3.2	3.2	79.3
Lawn and Garden	1200	6	2.1	2.1	81.4
Lawn & Garden & Tree	1230	7	2.5	2.5	83.9
Garden Only	200	22	7.9	7.9	91.8
Garden and Other	204	1	.4	.4	92.1
Garden and Trees	230	3	1.1	1.1	93.2

G & T & other	234	2	.7	.7	93.9

• Q12S18 **Use of Pesticides continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Trees only	30	8	2.9	2.9	96.8
Trees and Other	34	1	.4	.4	97.1
Other	4	3	1.1	1.1	98.2
No Response	9	5	1.8	1.8	100.0
	Total	280	100.0	100.0	

• Q13S19 **Ownership of a Cat/Dog**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Neither	0	96	34.3	34.3	34.3
Dog	1	88	31.4	31.4	65.7
Cat	2	65	23.2	23.2	88.9
Both	3	31	11.1	11.1	100.0
	Total	280	100.0	100.0	

• Q13S20 **Run Freely/ Tied up/ Fenced In**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Run freely	1	48	17.1	17.1	17.1
Tied up/ Fenced In	2	114	40.7	40.7	57.9
Not Applicable	8	109	38.9	38.9	96.8
No Response	9	9	3.2	3.2	100.0
	Total	280	100.0	100.0	

• Q13S21 **Poop & Scoop**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	110	39.3	39.3	39.3
No	2	7	2.5	2.5	41.8
Not Applicable	8	144	51.4	51.4	93.2
No Response	9	19	6.8	6.8	100.0
	Total	280	100.0	100.0	

• Q14S22 **Compost Garbage**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	146	52.1	52.1	52.1
No	2	133	47.5	47.5	99.6
No Response	9	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q15S23 **Salt Driveway/ Side Walks**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	123	43.9	43.9	43.9
No	2	153	54.6	54.6	98.6
Alternative	3	3	1.1	1.1	99.6
No Response	9	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q16S24 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	260	92.9	92.9	92.9
Water	1	20	7.1	7.1	100.0
	Total	280	100.0	100.0	

• Q16S25 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	228	81.4	81.4	81.4
Park/Conservation Area	2	52	18.6	18.6	100.0
	Total	280	100.0	100.0	

• Q16S26 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	269	96.1	96.1	96.1
Farmland	3	11	3.9	3.9	100.0
	Total	280	100.0	100.0	

• Q16S27 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	262	93.6	93.6	93.6
Forest	4	18	6.4	6.4	100.0
	Total	280	100.0	100.0	

• Q16S28 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	271	96.8	96.8	96.8
Industrial	5	9	3.2	3.2	100.0
	Total	280	100.0	100.0	

• Q16S29 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	21	7.5	7.5	7.5
Residential	6	259	92.5	92.5	100.0
	Total	280	100.0	100.0	

• Q16S30 **Features on neighbouring properties**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	270	96.4	96.4	96.4
Other	7	10	3.6	3.6	100.0
	Total	280	100.0	100.0	

• Q17S31 **Membership in Community Organizations**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not a Member of any	0	162	57.9	57.9	57.9
Yes, Unspecified	1	24	8.6	8.6	66.4
Church, including youth groups	2	14	5.0	5.0	71.4
Cubs, Scouts, Guides	3	15	5.4	5.4	76.8
Minor Sports Org. (Hockey)	4	5	1.8	1.8	78.6
Service Organization	5	11	3.9	3.9	82.5
Nature Organization	6	12	4.3	4.3	86.8
Charity Organization	7	8	2.9	2.9	89.6
No Response	9	15	5.4	5.4	95.0
Social Clubs	10	11	3.9	3.9	98.9
Cultural Groups	11	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q18S32 **Nature/Environmental Affiliation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not a member of any group	0	177	63.2	63.2	63.2
Dufferin Naturalists	1	1	.4	.4	63.6
Horticultural Society	2	14	5.0	5.0	68.6
Other Local Nature groups	3	5	1.8	1.8	70.4
Hunting/ Fishing Clubs	4	12	4.3	4.3	74.6
Local nature sports	5	2	.7	.7	75.4
Through a school	6	4	1.4	1.4	76.8
Local Gov. Environmentalists	7	4	1.4	1.4	78.2
No Response	9	6	2.1	2.1	80.4
Local environment groups	10	12	4.3	4.3	84.6
Provincial Level Organization	11	6	2.1	2.1	86.8
International/Greenpeace	12	21	7.5	7.5	94.3
Cubs,Scouts, Guides,	13	11	3.9	3.9	98.2
Undefined	14	5	1.8	1.8	100.0
	Total	280	100.0	100.0	

• Q19S33 **Type of Environmental Organization they would join**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Would not join	0	83	29.6	29.6	29.6
International Only	100000	10	3.6	3.6	33.2
I & N	100050	2	.7	.7	33.9
I & H	100400	1	.4	.4	34.3
I & Local	103000	2	.7	.7	35.0
I & Local & Nature	103050	1	.4	.4	35.4
I & Prov & Nature	120050	1	.4	.4	35.7
Int. & Prov. & Local	123000	2	.7	.7	36.4
I&P&L&H& Nature Group	123450	1	.4	.4	36.8
Provincial Only	20000	8	2.9	2.9	39.6
Prov. & Local	23000	4	1.4	1.4	41.1
Prov & Local & Hunting	23400	3	1.1	1.1	42.1
Local Only	3000	56	20.0	20.0	62.1
Local and other	3006	2	.7	.7	62.9
L & N	3050	8	2.9	2.9	65.7
Local & Hunting	3400	8	2.9	2.9	68.6
L&H& Nature	3450	2	.7	.7	69.3
Hunting & Fishing On	400	36	12.9	12.9	82.1
L & Other	406	1	.4	.4	82.5
H& Nature Groups	450	2	.7	.7	83.2

H&N& Other	456	1	.4	.4	83.6

• Q16S32 **Nature/Environmental Affiliation continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Group Only	50	22	7.9	7.9	91.4
Other Only	6	7	2.5	2.5	93.9
No Response	9	17	6.1	6.1	100.0
	Total	280	100.0	100.0	

• Q20S34 **Most effective type of Environmental Organization**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
International/Nation	1	34	12.1	12.1	12.1
Provincial Size	2	40	14.3	14.3	26.4
Locally based	3	95	33.9	33.9	60.4
Hunting & Fishing	4	19	6.8	6.8	67.1
Nature Groups	5	4	1.4	1.4	68.6
Other	6	2	.7	.7	69.3
No response	9	86	30.7	30.7	100.0
	Total	280	100.0	100.0	

• Q21S35 **Planted trees on the property?**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	160	57.1	57.1	57.1
No	2	110	39.3	39.3	96.4
Not Applicable	8	5	1.8	1.8	98.2
No Response	9	5	1.8	1.8	100.0
	Total	280	100.0	100.0	

• Q21S36 **How many?**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	37	13.2	13.2	13.2
	2	32	11.4	11.4	24.6
	3	18	6.4	6.4	31.1
	4	11	3.9	3.9	35.0
	5	16	5.7	5.7	40.7
	6	7	2.5	2.5	43.2
	7	3	1.1	1.1	44.3
Not Applicable	8	89	31.8	31.8	76.1
No Response	9	43	15.4	15.4	91.4
	10	11	3.9	3.9	95.4
	12	2	.7	.7	96.1
	14	1	.4	.4	96.4
	15	2	.7	.7	97.1
	18	1	.4	.4	97.5
	20	4	1.4	1.4	98.9
	22	1	.4	.4	99.3
	25	1	.4	.4	99.6
	40	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q21S37 **Years ago Planted (Avg)**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	.4	.4	.4
	1	28	10.0	10.0	10.4
	2	1	.4	.4	10.7
	2	17	6.1	6.1	16.8
	3	1	.4	.4	17.1
	3	15	5.4	5.4	22.5
	4	2	.7	.7	23.2
	4	11	3.9	3.9	27.1
	5	1	.4	.4	27.5
	5	15	5.4	5.4	32.9
	6	7	2.5	2.5	35.4
	7	1	.4	.4	35.7
	7	9	3.2	3.2	38.9
	8	1	.4	.4	39.3
Not Applicable	8	90	32.1	32.1	71.4
No Response	9	51	18.2	18.2	89.6
	10	13	4.6	4.6	94.3
	11	2	.7	.7	95.0
	12	1	.4	.4	95.4
	13	1	.4	.4	95.7
	14	1	.4	.4	96.1
	15	4	1.4	1.4	97.5
	17	1	.4	.4	97.9
	18	1	.4	.4	98.2
	20	2	.7	.7	98.9
	21	2	.7	.7	99.6
	25	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q21S38A **Type of Tree Planted**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Spruce	1	44	15.7	15.7	15.7
Pine	2	14	5.0	5.0	20.7
Cedar	3	10	3.6	3.6	24.3
Willow	4	3	1.1	1.1	25.4
Birch	5	13	4.6	4.6	30.0
Lilac	6	4	1.4	1.4	31.4
Maple	7	31	11.1	11.1	42.5
Not Applicable	8	107	38.2	38.2	80.7
No Response	9	34	12.1	12.1	92.9
Walnut	10	2	.7	.7	93.6
Fruit	11	10	3.6	3.6	97.1
Mulberry	12	2	.7	.7	97.9
Other	13	5	1.8	1.8	99.6
Fir	14	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q21S38B **Type of Tree Planted**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Spruce	1	7	2.5	2.5	2.5
Pine	2	7	2.5	2.5	5.0
Cedar	3	9	3.2	3.2	8.2
Willow	4	1	.4	.4	8.6

• Q21S38B **Type of Tree Planted continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Birch	5	6	2.1	2.1	10.7
Lilac	6	1	.4	.4	11.1
Maple	7	15	5.4	5.4	16.4
Not Applicable	8	176	62.9	62.9	79.3
No Response	9	32	11.4	11.4	90.7
Walnut	10	1	.4	.4	91.1
Fruit	11	12	4.3	4.3	95.4
Mulberry	12	1	.4	.4	95.7
Other	13	12	4.3	4.3	100.0
	Total	280	100.0	100.0	

• Q21S38C **Type of Tree planted**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Spruce	1	8	2.9	2.9	2.9
Pine	2	2	.7	.7	3.6
Cedar	3	1	.4	.4	3.9
Birch	5	3	1.1	1.1	5.0
Lilac	6	2	.7	.7	5.7
Maple	7	5	1.8	1.8	7.5
Not Applicable	8	217	77.5	77.5	85.0
No Response	9	34	12.1	12.1	97.1
Walnut	10	1	.4	.4	97.5
Fruit	11	3	1.1	1.1	98.6
Other	13	4	1.4	1.4	100.0
	Total	280	100.0	100.0	

• Q21S39 **Water Saving Devices**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not Installed	0	136	48.6	48.6	48.6
Shower Head	100000	88	31.4	31.4	80.0
Shower Head & Appliance	100400	3	1.1	1.1	81.1
S & Tap	103000	10	3.6	3.6	84.6
Shower & Toilet	120000	10	3.6	3.6	88.2
S & T & Other	120006	1	.4	.4	88.6
S & T & A	120400	1	.4	.4	88.9
S & T & Taps	123000	1	.4	.4	89.3
Low Flow Toilets/Toi	20000	9	3.2	3.2	92.5
Taps	3000	6	2.1	2.1	94.6
Water Tank Insulator	50	1	.4	.4	95.0
Other	6	10	3.6	3.6	98.6
No Response	9	4	1.4	1.4	100.0
	Total	280	100.0	100.0	

• Q21S40 **Recycle**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	8	2.9	2.9	2.9
Plastic & Glass	1004	1	.4	.4	3.2
Plastics & Metal	1030	1	.4	.4	3.6
Plastics & Metal & Glass	1034	2	.7	.7	4.3
Plastics & Paper	1200	7	2.5	2.5	6.8
Plastics & Paper & Glass	1204	30	10.7	10.7	17.5
Pl & P & Metal	1230	4	1.4	1.4	18.9

• Q23S40 **Recycle continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
All	1234	215	76.8	76.8	95.7
Paper	200	3	1.1	1.1	96.8
Paper & Glass	204	1	.4	.4	97.1
Paper & Metal Cans	230	1	.4	.4	97.5
P & M & Glass	234	5	1.8	1.8	99.3
M & Glass	34	1	.4	.4	99.6
No Response	9	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q24S41 **Disposal Of Hazardous Goods**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Do Nothing	0	13	4.6	4.6	4.6
Take to Dump/ Special day	1	184	65.7	65.7	70.4
Put in Garbage	2	8	2.9	2.9	73.2
Pour Down Sink/Toilet	3	4	1.4	1.4	74.6
Other	6	6	2.1	2.1	76.8
Local Garage	7	21	.5	7.5	84.3
Not Applicable	8	8	2.9	2.9	87.1
No Response	9	36	12.9	12.9	100.0
	Total	280	100.0	100.0	

• Q25S42 **Presence of a Bird feeder**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	168	60.0	60.0	60.0
No	2	111	39.6	39.6	99.6
No Response	9	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q26S43 **Interested in Attracting Birds/Butterflies**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	209	74.6	74.6	74.6
No	2	65	23.2	23.2	97.9
No Response	9	6	2.1	2.1	100.0
	Total	280	100.0	100.0	

• Q27S44 **Origin of Tap Water**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Groundwater/ Wells	1	172	61.4	61.4	61.4
Rivers, Lakes, etc.	2	35	12.5	12.5	73.9
Other	3	26	9.3	9.3	83.2
Did Not Know	4	20	7.1	7.1	90.4
No Response	9	27	9.6	9.6	100.0
	Total	280	100.0	100.0	

• Q29S45 **Let Water Run To Cool**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	89	31.8	31.8	31.8
No	2	188	67.1	67.1	98.9
Not Applicable	8	1	.4	.4	99.3
No Response	9	2	.7	.7	100.0
	Total	280	100.0	100.0	

• Q29S46 **Which Watershed are you In?**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Credit Valley	1	54	19.3	19.3	19.3
Dufferin	2	1	.4	.4	19.6
Nottawasauga	3	2	.7	.7	20.4
Mill Creek	4	5	1.8	1.8	22.1
Menora Creek	5	4	1.4	1.4	23.6
Did not Know	6	160	57.1	57.1	80.7
No Response	9	54	19.3	19.3	100.0
	Total	280	100.0	100.0	

• Q30S47 **In which Conservation Authority are you?**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
CVC	1	124	44.3	44.3	44.3
Nottawasauga CA	2	2	.7	.7	45.0
Naigara Escarpment C	3	1	.4	.4	45.4
Grand river CA	4	1	.4	.4	45.7
Other	5	14	5.0	5.0	50.7
Did Not Know	6	95	33.9	33.9	84.6
Dufferin	7	5	1.8	1.8	86.4
No Response	9	38	13.6	13.6	100.0
	Total	280	100.0	100.0	

• Q31S48 **Top 5 Environmental Issues**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Waste disposal/landfill	1	186	66.4	66.4	66.4
Global warming/climate	2	29	10.4	10.4	76.8
Ozone depletion	3	27	9.6	9.6	86.4
Water quality concerns	4	14	5.0	5.0	91.4
Air quality concerns	5	4	1.4	1.4	92.9
Wetland preservation	6	5	1.8	1.8	94.6
Deforestation	7	1	.4	.4	95.0
No Response	9	10	3.6	3.6	98.6
Overpopulation	10	1	.4	.4	98.9
Toxic waste/nuclear	12	1	.4	.4	99.3
Loss of wildlife habitat	13	1	.4	.4	99.6
Loss of species diversity	14	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q31S49 **Top 5 Environmental Issues**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Waste Disposal/Landfill	1	4	1.4	1.4	1.4
Global warming/climate	2	53	18.9	18.9	20.4
Ozone depletion	3	76	27.1	27.1	47.5
Water quality concerns	4	82	29.3	29.3	76.8
Air quality concerns	5	27	9.6	9.6	86.4
Wetland preservation	6	13	4.6	4.6	91.1
Deforestation	7	12	4.3	4.3	95.4
No response	9	10	3.6	3.6	98.9
Overpopulation	10	1	.4	.4	99.3
Loss of wildlifw habitat	13	2	.7	.7	100.0
	Total	280	100.0	100.0	

•• Q31S50 **Top 5 Environmental Issues**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Waste disposal/landfill	1	1	.4	.4	.4
Global warming/climat	2	3	1.1	1.1	1.4
Ozone depletion	3	30	10.7	10.7	12.1
Water quality concerns	4	55	19.6	19.6	31.8
Air quality concerns	5	70	25.0	25.0	56.8
Wetland preservation	6	39	13.9	13.9	70.7
Deforestation	7	42	15.0	15.0	85.7
No response	9	10	3.6	3.6	89.3
Overpopulation	10	15	5.4	5.4	94.6
Acid precipitation	11	1	.4	.4	95.0
Toxic waste/nuclear	12	5	1.8	1.8	96.8
Loss of wildlife habitats	13	7	2.5	2.5	99.3
Loss of species diversity	14	1	.4	.4	99.6
Other	15	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q31S51 **Top 5 Environmental Issues**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Ozone depletion	3	2	.7	.7	.7
Water quality concerns	4	14	5.0	5.0	5.7
Air quality concerns	5	41	14.6	14.6	20.4
Wetland preservation	6	23	8.2	8.2	28.6
Deforestation	7	50	17.9	17.9	46.4
No response	9	16	5.7	5.7	52.1
Overpopulation	10	31	11.1	11.1	63.2
Acid precipitation	11	20	7.1	7.1	70.4
Toxic waste/nulear	12	54	19.3	19.3	89.6
Loss of wildlife habitats	13	26	9.3	9.3	98.9
Loss of species diversity	14	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q31S52 **Top 5 Environmental Issues**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Waste disposal/landfill	1	1	.4	.4	.4
Global warming/climate	2	1	.4	.4	.7
Ozone depletion	3	1	.4	.4	1.1
Water quality concerns	4	2	.7	.7	1.8
air quality concerns	5	6	2.1	2.1	3.9

•• Q31S52 **Top 5 Environmental Issues**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Wetland preservation	6	2	.7	.7	4.6
Deforestation	7	15	5.4	5.4	10.0
No repsponse	9	24	8.6	8.6	18.6
Overpopulation	10	14	5.0	5.0	23.6
Acid precipitation	11	9	3.2	3.2	26.8
Toxic waste/nuclear	12	52	18.6	18.6	45.4
Loss of wildlife habitats	13	112	40.0	40.0	85.4
Loss of species diversity	14	36	12.9	12.9	98.2
Other	15	5	1.8	1.8	100.0
	Total	280	100.0	100.0	

•• Q31S53 **Knowledge of Local Creeks & Rivers**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	0	99	35.4	35.4	35.4
Credit River	1	70	25.0	25.0	60.4
CR & MC	12	10	3.6	3.6	63.9
CR & NR	13	5	1.8	1.8	65.7
CR & GR	16	1	.4	.4	66.1
Mill Creek/John St.	2	23	8.2	8.2	74.3
MC & GR	26	1	.4	.4	74.6
Nottawassauga river	3	6	2.1	2.1	76.8
Menora Creek	4	2	.7	.7	77.5
Three or More Mentioned	5	18	6.4	6.4	83.9
Grand River	6	4	1.4	1.4	85.4
not applicable	8	4	1.4	1.4	86.8
No Response	9	37	13.2	13.2	100.0
	Total	280	100.0	100.0	

• Q31S54 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	244	87.1	87.1	87.1
canoeing	1	33	11.8	11.8	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q31S55 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	221	78.9	78.9	78.9
fishing	2	56	20.0	20.0	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q31S56 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	148	52.9	52.9	52.9
walking, running/hiking	3	129	46.1	46.1	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q33S57 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	210	75.0	75.0	75.0
picnicking	4	67	23.9	23.9	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q33S58 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	259	92.5	92.5	92.5
skiing	5	18	6.4	6.4	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q33S59 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	214	76.4	76.4	76.4
bird watching/nature	6	63	22.5	22.5	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q33S60 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	237	84.6	84.6	84.6
swimming	7	40	14.3	14.3	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q33S61 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	270	96.4	96.4	96.4
no response	9	3	1.1	1.1	97.5
snowmobiling	10	7	2.5	2.5	100.0
	Total	280	100.0	100.0	

• Q33S62 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	264	94.3	94.3	94.3
no response	9	3	1.1	1.1	95.4
other	11	13	4.6	4.6	100.0
	Total	280	100.0	100.0	

• Q33S63 **Activities around the Credit River**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	183	65.4	65.4	65.4
no response	9	3	1.1	1.1	66.4
Does not use at all	12	94	33.6	33.6	100.0
	Total	280	100.0	100.0	

• Q34S64 **Wildlife Problem/Asset**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Problem	1	49	17.5	17.5	17.5
Asset	2	210	75.0	75.0	92.5
No Response	9	21	7.5	7.5	100.0
	Total	280	100.0	100.0	

• Q34S65 **Examples of Wildlife Problem/Assets**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Asthetically Pleasing	1	50	17.9	17.9	17.9
Education, Knowledge	2	27	9.6	9.6	27.5
Get in Garbage	3	17	6.1	6.1	33.6
Rabies	4	1	.4	.4	33.9
Attack on Children/People	5	4	1.4	1.4	35.4
Other	6	24	8.6	8.6	43.9
Pests	7	3	1.1	1.1	45.0
not applicable	8	8	2.9	2.9	47.9
No Response	9	146	52.1	52.1	100.0
	Total	280	100.0	100.0	

• Q35S66 **Who to Call in an Environmental Emergency**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
City Hall	1	59	21.1	21.1	21.1
Police	2	79	28.2	28.2	49.3
Fire Dept.	3	23	8.2	8.2	57.5
CVC	4	9	3.2	3.2	60.7
MNR	5	3	1.1	1.1	61.8
MOEE	6	22	7.9	7.9	69.6
Other	7	25	8.9	8.9	78.6
No Response	9	60	21.4	21.4	100.0
	Total	280	100.0	100.0	

• Q36S67 **Property more environmentally friendly**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	247	88.2	88.2	88.2
No	2	28	10.0	10.0	98.2
No Response	9	5	1.8	1.8	100.0
	Total	280	100.0	100.0	

• Q37S68 **Attend a Workshop**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	99	35.4	35.4	35.4
No	2	175	62.5	62.5	97.9
No Response	9	6	2.1	2.1	100.0
	Total	280	100.0	100.0	

• Q38S69 **Buffers - Reduce Erosion**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	24	8.6	8.6	8.6
A little Improved	2	82	29.3	29.3	37.9
A lot improved	3	114	40.7	40.7	78.6
No Response	9	60	21.4	21.4	100.0
	Total	280	100.0	100.0	

• Q38S70 **Buffers - Reduce Flooding**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	42	15.0	15.0	15.0
A little Improved	2	86	30.7	30.7	45.7
A lot improved	3	87	31.1	31.1	76.8
No Response	9	65	23.2	23.2	100.0
	Total	280	100.0	100.0	

• Q38S71 **Buffers - Improve Water Quality**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	28	10.0	10.0	10.0
A little Improved	2	85	30.4	30.4	40.4
A lot improved	3	104	37.1	37.1	77.5
No Response	9	63	22.5	22.5	100.0
	Total	280	100.0	100.0	

• Q38S72 **Buffers - Provide Wildlife Habitat**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	14	5.0	5.0	5.0
A little Improved	2	73	26.1	26.1	31.1
A lot improved	3	134	47.9	47.9	78.9
No Response	9	59	21.1	21.1	100.0
	Total	280	100.0	100.0	

• Q38S73 **Buffers - Enhance Aesthetics**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	19	6.8	6.8	6.8
A little Improved	2	70	25.0	25.0	31.8
A lot improved	3	126	45.0	45.0	76.8
No Response	9	65	23.2	23.2	100.0
	Total	280	100.0	100.0	

• Q38S74 **Buffers - Provide Recreational Opportunities**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	49	17.5	17.5	17.5
A little Improved	2	76	27.1	27.1	44.6
A lot improved	3	89	31.8	31.8	76.4
No Response	9	66	23.6	23.6	100.0
	Total	280	100.0	100.0	

• Q38S75 **Buffers - Reduce Water Temperature**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	46	16.4	16.4	16.4
A little Improved	2	87	31.1	31.1	47.5
A lot improved	3	73	26.1	26.1	73.6
No Response	9	74	26.4	26.4	100.0
	Total	280	100.0	100.0	

• Q38S76 **Buffers - Reduce External Impacts**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all improved	1	34	12.1	12.1	12.1
A little Improved	2	84	30.0	30.0	42.1
A lot improved	3	92	32.9	32.9	75.0
No Response	9	70	25.0	25.0	100.0
	Total	280	100.0	100.0	

• Q39S77 **Motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Nothing	0	204	72.9	72.9	72.9
Would not participate	1	42	15.0	15.0	87.9
No response	9	34	12.1	12.1	100.0
	Total	280	100.0	100.0	

• Q39S78 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	164	58.6	58.6	58.6
maintain property values	1	81	28.9	28.9	87.5
no response	9	35	12.5	12.5	100.0
	Total	280	100.0	100.0	

• Q39S79 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	191	68.2	68.2	68.2
property rights maintained	3	54	19.3	19.3	87.5
no response	9	35	12.5	12.5	100.0
	Total	280	100.0	100.0	

• Q39S80 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	203	72.5	72.5	72.5
restrictions on trespassing	4	42	15.0	15.0	87.5
no response	9	35	12.5	12.5	100.0
	Total	280	100.0	100.0	

•• Q39S81 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	134	47.9	47.9	47.9
increased visual aesthetics	5	111	39.6	39.6	87.5
no response	9	35	12.5	12.5	100.0
	Total	280	100.0	100.0	

•• Q39S82 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	173	61.8	61.8	61.8
reduce flooding	6	72	25.7	25.7	87.5
no response	9	35	12.5	12.5	100.0
	Total	280	100.0	100.0	

• Q39S83 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	155	55.4	55.4	55.4
reduced erosion	7	89	31.8	31.8	87.1
no response	9	36	12.9	12.9	100.0
	Total	280	100.0	100.0	

• Q39S84 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	122	43.6	43.6	43.6
no response	9	35	12.5	12.5	56.1
improved water quality	10	123	43.9	43.9	100.0
	Total	280	100.0	100.0	

• Q39S85 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	123	43.9	43.9	43.9
no response	9	32	11.4	11.4	55.4
increase wildlife habitats	11	125	44.6	44.6	100.0
	Total	280	100.0	100.0	

• Q39S86 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	165	58.9	58.9	58.9
no response	9	33	11.8	11.8	70.7
increased recreation	12	82	29.3	29.3	100.0
	Total	280	100.0	100.0	

• Q39S87 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	148	52.9	52.9	52.9
no response	9	34	12.1	12.1	65.0
improved fish habitats	13	98	35.0	35.0	100.0
	Total	280	100.0	100.0	

• Q39S88 **motivation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
nothing	0	237	84.6	84.6	84.6
no reponse	9	34	12.1	12.1	96.8
other	14	9	3.2	3.2	100.0
	Total	280	100.0	100.0	

• Q40S89 **Gender**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Male	1	119	42.5	42.5	42.5
Female	2	154	55.0	55.0	97.5
no response	9	7	2.5	2.5	100.0
	Total	280	100.0	100.0	

• Q41S90 **Age category**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
< 13	1	1	.4	.4	.4
14 - 19	2	12	4.3	4.3	4.6
20 - 24	3	10	3.6	3.6	8.2
25 - 29	4	27	9.6	9.6	17.9
30 - 34	5	53	18.9	18.9	36.8
35 - 39	6	47	16.8	16.8	53.6
40 - 44	7	39	13.9	13.9	67.5
no response	9	4	1.4	1.4	68.9
45 - 49	10	30	10.7	10.7	79.6
50 - 54	11	13	4.6	4.6	84.3
55 - 59	12	11	3.9	3.9	88.2
60 - 64	13	13	4.6	4.6	92.9

• Q41S90 **Age categories continued**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
65 - 69	14	4	1.4	1.4	94.3
70+	15	16	5.7	5.7	100.0
	Total	280	100.0	100.0	

• Q42S91 **No. of People in the House**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	3.9	3.9	3.9
	2	59	21.1	21.1	25.0
	3	56	20.0	20.0	45.0
	4	90	32.1	32.1	77.1
	5	40	14.3	14.3	91.4
	6	18	6.4	6.4	97.9
	7	3	1.1	1.1	98.9
no response	9	3	1.1	1.1	100.0
	Total	280	100.0	100.0	

• Q43S92 **Last School Attended**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Elementary	1	5	1.8	1.8	1.8
High School	2	77	27.5	27.5	29.3
College/Post Secondary	3	123	43.9	43.9	73.2
University	4	74	26.4	26.4	99.6
No Response	9	1	.4	.4	100.0
	Total	280	100.0	100.0	

• Q43S93 **Occupation**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Clerical and Related	1	24	8.6	8.6	8.6
Sales Occupations	2	13	4.6	4.6	13.2
Service Occupations	3	23	8.2	8.2	21.4
Farming, Fishing, Forestry	4	6	2.1	2.1	23.6
Production Process and related	5	11	3.9	3.9	27.5
Construction Trades	6	15	5.4	5.4	32.9
Transportation and Other	7	12	4.3	4.3	37.1
no response	9	14	5.0	5.0	42.1
Teaching and Related	10	22	7.9	7.9	50.0
Scientific and Technical	11	33	11.8	11.8	61.8
Social Sciences and Artistic	12	17	6.1	6.1	67.9
Managerial and Administration	13	28	10.0	10.0	77.9
Retired	14	19	6.8	6.8	84.6
Homemaker	15	30	10.7	10.7	95.4
Student	16	6	2.1	2.1	97.5
Other	17	7	2.5	2.5	100.0
	Total	280	100.0	100.0	

• Q45S94 **Income Range**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
under 40,000	1	57	20.4	20.4	20.4
40,000 - 79,000	2	141	50.4	50.4	70.7
80,000 +	3	38	13.6	13.6	84.3
no response	9	44	15.7	15.7	100.0
	Total	280	100.0	100.0	

• Q46S95 **Internet Access**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	109	38.9	38.9	38.9
No	2	164	58.6	58.6	97.5
no response	9	7	2.5	2.5	100.0
	Total	280	100.0	100.0	

• Q47S96 **Do You read the Banner**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no not read	0	45	16.1	16.1	16.1
Banner 1/wk	11	56	20.0	20.0	36.1
Banner 2/wk	12	164	58.6	58.6	94.6
no response	9	15	5.4	5.4	100.0
	Total	280	100.0	100.0	

• Q47S97 **Do you read the Citizen**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Does Not Read	0	32	11.4	11.4	11.4
Reads Citizen 1/wk	21	229	81.8	81.8	93.2
no response	9	19	6.8	6.8	100.0
	Total	280	100.0	100.0	

• QM1S98 **Derive Enjoyment from Proximity to Mill Creek**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	54	19.3	19.3	19.3
A little	2	35	12.5	12.5	31.8
A lot	3	25	8.9	8.9	40.7
not applicable	8	127	45.4	45.4	86.1
no response	9	39	13.9	13.9	100.0
	Total	280	100.0	100.0	

• QM2S99 **Enhances Value of Property**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not At All	1	78	27.9	27.9	27.9
Somewhat	2	22	7.9	7.9	35.7
A Lot	3	12	4.3	4.3	40.0
Not applicable	8	127	45.4	45.4	85.4
No response	9	41	14.6	14.6	100.0
	Total	280	100.0	100.0	

• QM3S100 **Current Environmental State Of Mill Creek**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Poor	1	5	1.8	1.8	1.8
Poor	2	35	12.5	12.5	14.3
Good	3	39	13.9	13.9	28.2
Very Good	4	7	2.5	2.5	30.7
Excellant	5	2	.7	.7	31.4
not applicable	8	127	45.4	45.4	76.8
no response	9	65	23.2	23.2	100.0
	Total	280	100.0	100.0	

• QM4S101 **Propensity to Volunteer**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	70	25.0	25.0	25.0
No	2	41	14.6	14.6	39.6
Not applicable	8	126	45.0	45.0	84.6
No response	9	43	15.4	15.4	100.0
	Total	280	100.0	100.0	

Correlations

			Mill Creek Ages	Level of Enjoyment derived from Mill Creek	Mill Creek Enhances the Value of your Property	Current Environmental State of Mill Creek
Spearman's rho	Correlation Coefficient	Mill Creek Ages	1.000	.014	-.010	-.034
		Level of Enjoyment derived from Mill Creek	.014	1.000	.805**	.382**
		Mill Creek Enhances the Value of your Property	-.010	.805**	1.000	.500**
		Current Environmental State of Mill Creek	-.034	.382**	.500**	1.000
	Sig. (1-tailed)	Mill Creek Ages	.	.434	.453	.337
		Level of Enjoyment derived from Mill Creek	.434	.	.000	.000
		Mill Creek Enhances the Value of your Property	.453	.000	.	.000
		Current Environmental State of Mill Creek	.337	.000	.000	.
	N	Mill Creek Ages	153	153	153	153
		Level of Enjoyment derived from Mill Creek	153	153	153	153
		Mill Creek Enhances the Value of your Property	153	153	153	153
		Current Environmental State of Mill Creek	153	153	153	153

**. Correlation is significant at the .01 level (1-tailed).

WORKSHOP Attend a Workshop by ED Education Recoded

WORKSHOP	Count	ED < Gr13 (1)	ED Secondary (2)	Row Total
1 Would Attend		20	79	99 / 35.4
2 Would Not		63	118	181 / 64.6
	Column Total	83 / 29.6	197 / 70.4	280 / 100.0

Chi-Square	Value	DF	Significance
Pearson	6.54497	1	.01052
Continuity Correction	5.86343	1	.01546
Likelihood Ratio	6.80131	1	.00911
Mantel-Haenszel test for linear association	6.52159	1	.01066

Minimum Expected Frequency - 29.346

Statistic		Value	ASE1	Val/ASE0	Approximate Significance
Lambda :					
symmetric		.00000	.00000		
with WORKSHOP	dependent	.00000	.00000		
with ED	dependent	.00000	.00000		
Goodman & Kruskal Tau :					
with WORKSHOP	dependent	.02337	.01701		.01066 *2
with ED	dependent	.02337	.01703		.01066 *2

*2 Based on chi-square approximation

Number of Missing Observations: 0

COMPOST2 Compost Recoded by ED Education Recoded

Count	ED < Gr13	ED Secondary	Row Total
	1	2	
COMPOST2			
1 Did Compost	41	105	146 52.1
2 Did Not	42	92	134 47.9
Column Total	83 29.6	197 70.4	280 100.0

Chi-Square	Value	DF	Significance
Pearson	.35628	1	.55058
Continuity Correction	.21708	1	.64128
Likelihood Ratio	.35610	1	.55068
Mantel-Haenszel test for linear association	.35501	1	.55129

Minimum Expected Frequency - 39.721

Statistic		Value	ASE1	Val/ASE0	Approximate Significance
Lambda :					
symmetric		.00461	.04188	.10977	
with COMPOST2	dependent	.00746	.06773	.10977	
with ED	dependent	.00000	.00000		
Goodman & Kruskal Tau :					
with COMPOST2	dependent	.00127	.00426		.55129 *2
with ED	dependent	.00127	.00427		.55129 *2

*2 Based on chi-square approximation

Number of Missing Observations: 0

WATER Let Water Run to Cool by ED Education Recoded

Count	ED < Gr13	Secondary 1	Secondary 2	Row Total
WATER				
1 Water Run to Coo	31	60		91 32.5
2 Did Not	52	137		189 67.5
Column Total	83 29.6	197 70.4		280 100.0

Chi-Square	Value	DF	Significance
Pearson	1.26462	1	.26078
Continuity Correction	.96994	1	.32470
Likelihood Ratio	1.24824	1	.26389
Mantel-Haenszel test for linear association	1.26010	1	.26163

Minimum Expected Frequency - 26.975

Statistic		Value	ASE1	Val/ASE0	Approximate Significance
Lambda :					
symmetric		.00000	.00000		
with WATER	dependent	.00000	.00000		
with ED	dependent	.00000	.00000		
Goodman & Kruskal Tau :					
with WATER	dependent	.00452	.00817		.26163 *2
with ED	dependent	.00452	.00817		.26163 *2

*2 Based on chi-square approximation

Number of Missing Observations: 0

BIRDS2 Attract Birds/Butterflies by ED Education Recoded

		ED	
	Count	< Gr13	Secondary
		1	2
BIRDS2			
1 Interested		53	157
2 Not Interested		30	40
	Column Total	83	197

	Row Total
	210
	75.0
	70
	25.0
	280
	100.0

Chi-Square	Value	DF	Significance
Pearson	7.81440	1	.00518
Continuity Correction	6.99244	1	.00819
Likelihood Ratio	7.49220	1	.00620
Mantel-Haenszel test for linear association	7.78650	1	.00526

Minimum Expected Frequency - 20.750

Statistic		Value	ASE1	Val/ASE0	Approximate Significance
Lambda :					
symmetric		.00000	.00000		
with BIRDS2	dependent	.00000	.00000		
with ED	dependent	.00000	.00000		
Goodman & Kruskal Tau :					
with BIRDS2	dependent	.02791	.02093		.00526 *2
with ED	dependent	.02791	.02089		.00526 *2

*2 Based on chi-square approximation

Number of Missing Observations: 0

WILDLIFE Wildlife Problem/Asset by ED Education Recoded

Count	ED < Gr13	Secondary 1	Secondary 2	Row Total
WILDLIFE 1 Problem	29	42		71 25.4
2 Not a Problem	54	155		209 74.6
Column Total	83 29.6	197 70.4		280 100.0

Chi-Square	Value	DF	Significance
Pearson	5.72334	1	.01674
Continuity Correction	5.02636	1	.02496
Likelihood Ratio	5.51558	1	.01885
Mantel-Haenszel test for linear association	5.70290	1	.01694

Minimum Expected Frequency - 21.046

Statistic		Value	ASE1	Val/ASE0	Approximate Significance
Lambda :					
symmetric		.00000	.00000		
with WILDLIFE	dependent	.00000	.00000		
with ED	dependent	.00000	.00000		
Goodman & Kruskal Tau :					
with WILDLIFE	dependent	.02044	.01785		.01694 *2
with ED	dependent	.02044	.01783		.01694 *2

*2 Based on chi-square approximation

Number of Missing Observations: 0

CA2 In Which CA are you In by ED Education Recoded

Count	ED < Gr13	Secondary	Row Total
	1	2	
CA2			
1 CVC	19	104	123 43.9
2 wrong response	64	93	157 56.1
Column Total	83 29.6	197 70.4	280 100.0

Chi-Square	Value	DF	Significance
Pearson	21.19576	1	.00000
Continuity Correction	19.99923	1	.00001
Likelihood Ratio	22.23636	1	.00000
Mantel-Haenszel test for linear association	21.12006	1	.00000

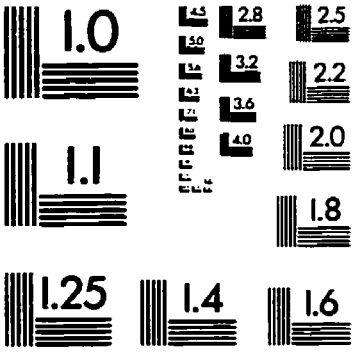
Minimum Expected Frequency - 36.461

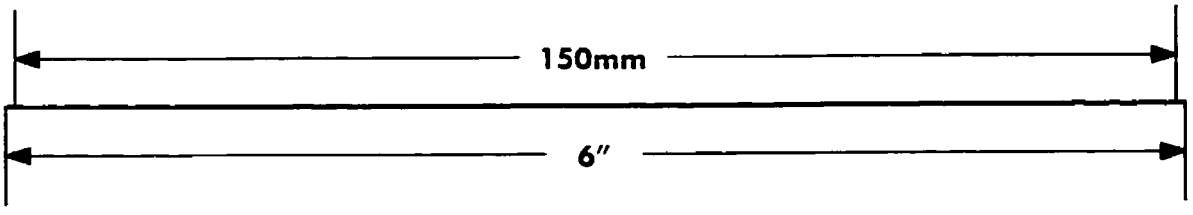
Statistic		Value	ASE1	Val/ASE0	Approximate Significance
Lambda :					
symmetric		.05340	.06631	.78458	
with CA2	dependent	.08943	.10889	.78458	
with ED	dependent	.00000	.00000		
Goodman & Kruskal Tau :					
with CA2	dependent	.07570	.02934		.00000 *2
with ED	dependent	.07570	.02958		.00000 *2

*2 Based on chi-square approximation

Number of Missing Observations: 0

IMAGE EVALUATION TEST TARGET (QA-3)





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