TOURISM AND THE PRECAUTIONARY PRINCIPLE: 
A SURVEY OF ACADEMIC AND GOVERNMENT 
STAKEHOLDERS 

by

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ABSTRACT

The purpose of this exploratory investigation was to provide a more precise understanding and basis from which to assess the potential role of the precautionary principle in tourism. The precautionary principle, analogous to the ideal of sustainable development, is a future-focused planning and regulatory mechanism that emphasizes pro-action and recognizes the limitations of contemporary scientific methods. A total of 100 respondents (80 tourism academics, 20 regional government tourism officials) from Canada, United States, United Kingdom, Australia and New Zealand completed the web-based survey between May and June 2003. Respondents reported their understanding of the precautionary principle, rated stakeholder involvement and education strategies, assessed potential barriers in implementation, and appraised steps of a proposed framework for implementation. Due to low sub sample numbers, measures of central tendency were primarily used to compare groups, while inferential statistics were applied when warranted. Results indicated that most respondents (79%) felt the principle could be a guiding principle for tourism, while local and regional government entities were reported to have the most power in the implementation process. Findings suggested close links between the precautionary principle and sustainability, as concern for future generations was the most critical element of the principle for tourism. Overall, tourism academics were more supportive of the precautionary principle in tourism than were regional government tourism officials. Only minor variation was found in responses among regional groups across all variables. This study established basic ground for understanding the precautionary principle in tourism and has been effective in formulating more precise questions for future research.
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CHAPTER 1: INTRODUCTION

1.1 Introduction

The precautionary principle has generated much interest and debate among government officials and academics as a new area of research that deals specifically with our understanding and management of human-environment interactions. The principle has been examined at most of the recent international environmental forums (Freestone & Hey, 1996) and has been regarded as the most notable anticipatory policy existing in international law, with particular application for environmental problems caused by humans (Gollier, Julien, & Treich, 2000). Touted as an effective method of protecting the environment and mankind from technologically-induced hazards (Rogers, Sinden, & De Lacy, 1997), the principle embodies the perception that preventative action reduces safety concerns and long-term costs. The precautionary principle has been invoked several times in protecting human health and environmental welfare, most notably in preventing further development of genetically modified (GM) organisms and decreasing the use of dangerous pesticides (Goldstein, 2001). The principle is often applied in circumstances where chemicals have potentially toxic or bio-accumulative effects, and where usage could lead to serious physical harm on humans or the environment.

Intuitively, the precautionary principle appeals to our sense of controlling risks and detrimental outcomes, designed to address scientific uncertainty in areas where failure to act may lead to future harm or disaster (Kaiser, 1997). The precautionary principle is unique in that it recognizes the limitations of contemporary scientific methods and data, thus promoting regulatory action to preclude or avoid environmental harm before it has occurred, even in the absence of scientific evidence linking cause-effect
relationships (Santillo, Stringer, Johnston, & Tickner, 1998). As such, the precautionary principle embodies a new shift in environmental policy, in which decision-makers are more cautious and proactive in preventing destruction and pollution (VanderZwaag, 1999). Inherent in the precautionary principle are several common-sense proverbs, including "better safe than sorry" and "an ounce of prevention is worth a pound of cure".

Characterising key elements of the sustainability approach, the precautionary principle is receiving greater global recognition and debate as more groups convey their viewpoints and positions on the principle. The range of discussion on the precautionary principle in the environment and health sectors conveys the need to study its merit for tourism. Due to tourism’s close link with the natural environment and the industry’s rising popularity (especially among nature-based activities), the question arises as to the relevancy of the precautionary principle in its application to managing/regulating tourism activities. In addressing the principle’s lack of study in tourism, the following investigation examined responses from key tourism stakeholders in order to provide a preliminary understanding of the principle’s potential for tourism planning. Outcomes derived from this investigation will produce a basic understanding of the principle’s relationship with tourism and help direct future study.

1.2 Statement of the Problem

The precautionary principle, first introduced internationally over 15 years ago, has been implemented as a regulatory guideline for environmental policy making and managing human health and environmental hazards in numerous regions around the
world. However, the prospects for integrating the precautionary principle into tourism are presently unknown, and there remains an absence of literature investigating the subject. Of particular relevance to tourism planning development is the belief that the precautionary principle is here to stay (VanderZwaag, 1999). The range of discussion on the principle's relevancy and application as well as its inclusion into a number of international treaties and conventions, serves as evidence of its potential in addressing uncertainties. As a global, inter-sectoral industry, tourism has significant environmental and socio-cultural uncertainties. Among many others, such uncertainties include the long-term effects of development and pollution on species and ecosystems, the level of natural resource depletion (e.g. water, fossil fuels), and the extent of deterioration of local identity and traditional cultures.

deFur and Kaszuba (2002) consider the precautionary principle to be an invaluable tool when policy makers are forced to make decisions with little or no experience or history on which to draw. Clearly, tourism development, especially that which occurs in new tourist regions unaccustomed to development, holds many uncertainties and unknown impacts. In such situations, there is often little experience or information to draw upon when making decisions and implementing policy. Often science is unable to give verified proof that tourism development and the associated infrastructure, which is often built on fragile environments, will not cause environmental damage now or in the long term (Fennell & Ebert, in press). It is especially in these circumstances that the precautionary principle holds relevance and applicability for the tourism industry. Moreover, greater emphasis has been placed on incorporating
sustainability concerns into tourism through planning mechanisms that embody the sustainability ideology.

A review of the literature indicates that the use of the precautionary principle for regulatory purposes is highly controversial, as there are many complexities to overcome in order to advance the precautionary principle from a slogan into precautionary action. Research suggests that perhaps the greatest problem is the wide variability in interpretations and the lack of a consensual definition (Bodansky, 1994; Dickson, 1999; Kaiser, 1997; Manson, 2002; VanderZwaag, 1999). Although the precautionary principle has been incorporated into several international environmental treaties and conventions, there remains considerable variation and disagreement in the existing definitions of this term. As the precautionary principle grows in popularity, questions also have arisen regarding its operationalization and practical implementation. Some researchers (Rogers et al., 1997; Kellow, 1999) argue that although the principle holds reason, it cannot be operationalized, since it fails to dictate how much caution should be exercised nor does it offer direct insights into how precaution is to be applied. As well, the principle has been criticized as being overly unscientific in nature (Gray & Bewers, 1996), with questions surrounding its application in specific cases and suggestions of the possibility of misuse or abuse by proponents.

The debate over the precautionary principle's function and viability will continue to become more vigorous, as more sides deliver input and the stakes heighten (Government of Canada, 2001a). VanderZwaag (1999) observes that the precautionary principle is still a young concept in need of greater global representation and examination. The future prospects for the continued and increased use of the
precautionary principle to protect the environment and human health appear to be excellent, especially when such issues alter dramatically as a result of new knowledge (deFur & Kaszuba, 2002). However, given the infancy of the concept, there is a general lack of information and data on the precautionary principle. This study seeks to examine key tourism stakeholders from several regions in their understanding and perception of the precautionary principle in tourism. To date, no studies have specifically examined the precautionary principle in tourism. Since the principle has been applied in environmental policy making, it makes intuitive sense that the precautionary principle could hold application in the tourism sector, which is typically reliant on the natural environment.

A review of the literature indicates differing degrees of acceptance of the precautionary principle depending on the geographical region. The precautionary principle first originated in Europe, where it has gained a strong foothold and has had more influence on environmental policy than in any other geographical region. Raffensperger (2002) notes that for thirty years, the principle has been used in Europe where it is part of the ethos, a philosophy and way of living and acting in the world. However, despite its discussion among academics and policy makers in the United States, the precautionary principle has yet to gain the strength and support it has received in Europe. While some U.S. policies could be characterized as precautionary in nature, the precautionary principle has not become an official part of U.S. environmental policy and although various levels of government have endorsed it (e.g. the President’s Council on Sustainable Development [PCSD]), few, if any U.S. laws cite the precautionary principle (Foster, Vecchia, & Repacholi, 2000; Raffensperger, 2002).

Canada has a long-standing history of implementing the precautionary approach
in science-based programs of health, safety and natural resources protection (Government of Canada, 2001a). The Australian Centre for Environmental Law [ACEL] (2003) reports that over the past decade, Australia, perhaps more than any other nation, has been poised to embrace implementation of the precautionary principle. To date, the precautionary principle has been broadly accepted in policy directives and legislation at all levels of government in Australia, and also has been specifically acknowledged as policy guidance for Australian oceans planning and management (Kriwoken, Rose, & Bache, 2001). Similarly, since 1995 the government of New Zealand has employed the precautionary approach as one of the guiding principles in the Environment 2010 Strategy for integration of environment, society, and the economy.

Inherent in this preliminary discussion of the precautionary principle is the notion that values seem to play an important role in determining whether to apply the precautionary principle. The principle clearly couples science with ethics, requiring policy makers to attach values to decision making. Myers (2002) states that the precautionary principle is more than taking precautions; it is about including values in policy choices, and represents an explicit endorsement of certain values. Kaiser (1997) agrees with this statement, noting that the degrees to which we are prepared take precautionary environmental action is closely related to the values attached to environment and to society.

VanderZwaag (1999) explains that the precautionary principle is caught between differing world views, suggesting that a group embodying strong ecological values would lobby for extreme interpretations of the principle, such as prohibiting the release of toxic chemicals, rejecting cost-benefit techniques to guide decisions, and transferring the
burden of proof onto those proposing change. On the other hand, a group representing a more utilitarian and risk-taking viewpoint would push for moderate interpretations, acknowledging the role of cost-benefit analysis and risk assessment. Since people generally embody different values and ethical standards, disagreement often ensues when deciding what is important to protect or on what to focus (e.g. environmental protection vs. economic gain). In this study, the sub-sample of academics was comprised of individuals with varying academic backgrounds and research interests related to tourism. Thus, it is possible these individuals may hold different values regarding the tourism sector and the viability of the precautionary principle as a planning tool for the industry.

1.3 Purpose Statement and Research Objectives

Due to the relative infancy of the precautionary principle as an environmental planning policy, its potential application to the tourism industry has yet to be examined. Therefore, this inquiry serves as an introductory exploration and is designed to gain an understanding of the status and possible application of the principle in tourism. The purpose of this investigation was to provide a more precise understanding and basis from which to assess the precautionary principle's potential role in tourism. More specifically, this study addressed the following research objectives:

a) To assess the entire study sample's understanding and opinion of the precautionary principle in tourism.

b) To evaluate which tourism stakeholders would have the power and skill set to be involved in implementing the precautionary principle into tourism decision-making.
c) To compare tourism academics' and regional government tourism officials' understanding and opinion of the precautionary principle in tourism.

d) To compare the responses of tourism academics from Canada, United States, United Kingdom, Australia and New Zealand in terms of their understanding and opinion of the precautionary principle in tourism.

e) To compare tourism academics with different departmental affiliations in terms of their understanding and opinion of the precautionary principle in tourism.

1.4 Importance of the Study

This study is important because at present, the precautionary principle is a topic of current debate in its applicability to several sectors including environmental protection, food safety, human welfare issues, and international trade (Goldstein, 2001). Although many of the sectors that have incorporated the precautionary principle into decision-making are closely related to tourism, the concept has received little attention in the realm of the tourism industry. The tourism industry requires planning mechanisms guided by sustainability measures that control for and mitigate threats accruing from tourism development. The precautionary principle could act as a regulation tool for policy makers to implement at various levels for the tourism industry itself, as well as across many health and environmental issues surrounding tourism. The precautionary principle is becoming more prevalent in the policy documents of various non-governmental organizations in which it is applied to the tourism context, including the Wilderness Society of Australia, the World Wildlife Fund, the Convention on Biological Diversity (United Nations Environment Programme), and the British Columbia Wilderness Tourism Association (Fennell & Ebert, in press). However, government entities and
tourism researchers have yet to comment on the precautionary principle in its application to the tourism industry. Hence, this examination of the precautionary principle’s relevance to the tourism industry serves as an introductory study. Information gathered in this study help can further the understanding and direct future research on how the principle may be applied in the tourism industry, what entity could implement the principle, and the manner in which it could gain the greatest exposure and acceptance.

In line with sustainable development, the precautionary principle puts the onus on the present population to address current actions that may incite potential risks and detrimental consequences on future generations. The tourism industry influences numerous negative impacts on the natural environments, as well as the social and cultural environments of the host community. Considering the vast scale and global scope of tourism, it comes as no surprise that harmful effects accruing from tourism development and tourist activities are becoming more evident. Such impacts will only increase in number and intensity as domestic and international travel rises. The World Tourism Organisation forecasts that by 2010 international tourist arrivals will have doubled from the early 1990s, to reach 937 million (Elliott, 1997). Humans have and will continue to encroach into every corner of the globe, including some of the world’s most diverse ecosystems. Increasing numbers of tourists who travel to both extensively developed areas or remote exotic locations are causing direct and indirect effects on the natural environment.

As global demands on space and resources continue to grow as a function of human population growth, pressure will continue to mount on the tourism sector to implement steps and adopt practices aimed at achieving a more sustainable and
environmentally sound industry. The challenge for the industry lies in determining how to achieve sustainability through environmental regulations, codes of conduct, and action plans, as well as by convincing tourists and tourism operators of the imperative to develop a commitment to the sustainable management of the industry. A sustainable tourism industry is in everybody's interest - tourists, tour operators, the local community, and all levels of government, among others. Along with efforts to maximise the benefits for these groups, it is imperative to minimise the negative impacts accrued to the industry's activities, namely the effects on the environment and biological diversity. The introduction of the precautionary principle into the realm of the tourism industry is one development tool that may be a sound planning mechanism that anticipates and controls for future impacts on environmental and human health.

1.5 Summary and Overview of Thesis

The prospects for integrating the precautionary principle into tourism are currently unknown, as there remains an absence of literature investigating the subject. With increasing application in environmental policy making, it makes intuitive sense that the precautionary principle could hold application in the tourism sector. Essentially, this research investigation has been developed from the growing global concern in finding practical methods or devices that can achieve sustainability measures. As an exploratory study, this investigation aims to provide some initial insight into the precautionary principle's potential role in tourism by surveying two key tourism stakeholder groups. The key objectives to be examined in this study aim to provide a basis to assess the precautionary principle within the tourism sector while the outcomes should formulate more precise questions and provide a sense of direction for future research.
CHAPTER 2: REVIEW OF LITERATURE

2.1 Introduction

A thorough review and examination of the literature is a requisite in order to develop the relationships between sustainability, the precautionary principle, and tourism. Since a dearth of literature currently exists in examining the relationship between the precautionary principle and tourism, much of this literature review involves providing initial links between key tourism sustainability concerns and the precautionary principle. The beginning of this literature review places the precautionary principle in line with the parent concepts of sustainable development and sustainable tourism. Much like these ideals, the precautionary principle is a pro-active, future focused concept that puts the continued well-being of natural systems and human health at the forefront. Following this discussion, a critique of current tourism planning tools emphasises the need to find practical methods of implementing sustainability measures. This review then provides a synopsis of the origins and main elements of the precautionary principle, and examines current philosophical issues surrounding the concept. Finally, a discussion of the precautionary principle’s application across different sectors and by regional groups further illustrates the links between the principle, tourism and sustainability.

2.2 The Broad Context of the Precautionary Principle in Tourism

2.2.1 Sustainable Development

Much of the current literature exploring tourism planning and the environment follow the ideal of sustainable development. The concept of sustainable development first originated through the convergence of economic development theory and
environmentalism (Hardy & Beeton, 2001). The Brundtland Report (1987) defines sustainable development as a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional changes are made consistent with future as well as present needs (World Commission on Environment and Development [WCED], 1987). Put succinctly, sustainable development refers to development that meets the needs of present populations without compromising the ability of future generations to meet their own needs. It is based on the idea that economic growth should occur in a more ecologically responsible and socially equitable manner. The Brundtland Report recognized that conventional economic production should be directed by both an ecological imperative to protect the atmosphere and a social imperative to minimize human suffering, both today and in the future (Wackernagel & Rees, 1996).

Sustainable development has been defined in a variety of ways, but the following definition developed in British Columbia, Canada, is very applicable in the context of tourism planning:

Sustainable development is positive socio-economic change that does not undermine the ecological and social systems upon which communities and society are dependent. Its successful implementation requires integrated policy, planning, and social learning processes; its political viability depends on the full support of the people it affects through their governments, their social institutions, and their private activities (Rees, 1989, p.13).

This definition is quite relevant because it highlights some key applications to tourism including the basic premise that change should be positive; development must not use resources recklessly; and successful implementation requires integrated public and private policies and actions (Gunn, 1993). Essentially, sustainable development should be regarded as a process (Roling, 1994) that embodies the imperative of taking a
long-term perspective in decision-making, and implies a need for intervention and planning (Swarbrooke, 1999). The concept of sustainable development has gained broad acceptance from many factions, as it is "invaluable in that it allows groups and individuals with divergent ideologies and perspectives to band together around a common theme" (Ioannides, 2001, p. 72).

A number of international reports, accords and statements concerning the goal of sustainability within global development have enabled the concept to gain greater concern and recognition. Archer (1996) lists the most influential reports encouraging sustainability as: the World Conservation Strategy, published in 1980 by the International Union for the Conservation of Nature and Natural Resources, which emphasised resource sustainability and the relationship between economic development and the conservation of natural resources; the Brandt Commission, also of 1980, which emphasised the need for development to include "care for the environment"; the UNEP-WTO Accord (1982), which highlighted the need for tourism development to be environmentally sound; and the Brundtland Report (1987), which pointed a path towards sustainable development with economic growth. This WCED report, entitled Our Common Future, together with many papers written by academics and practitioners, helped the term "sustainability" gain common usage and acceptance (Archer, 1996). McCool and Moisey (2001) note that although this document instigated much discussion concerning development and sustainability, it provided little guidance on how to actually achieve sustainability. However, with the publication of Our Common Future, the concept of sustainable development entered into mainstream political, environmental, and economic discourse around the world (Shabecoff, 1996).
2.2.2 Sustainable Tourism

The sustainable development approach is particularly important to the tourism industry because the sector relies heavily on the natural and cultural environments. Edgell (1999) observes that the 1960s were a basis for rising concerns about the environment, concerns that now comprise the foundation for much of the policy formulation in moving towards sustainable development in the tourism industry. During the 1970s, the increased prevalence and subsequent criticism of the numerous harmful environmental, cultural, and social consequences of tourism stirred the tourism industry and the international community to address these significant issues and move towards sustainability, as well as promoting alternative forms of tourism (Perez-Salom, 2001). Today, it is accepted that tourism is not a benign industry void of impacts; rather, it inevitably affects the environment, local populations, local economies, as well as the tourists (Butler, 1991).

The degradation of natural and local resources hinders the long-term viability of the tourism industry, as it is dependent on the conservation of local resources for continuous and responsible use in the future. Eccles (1995) contends that the traditional tourism product, based on a short-term profit-driven approach with less concern for nature, inevitably leads to a damaged environment that people will no longer pay to consume. In contrast, a tourism product that works to conserve the environment and protect ecological processes is more likely to remain successful and generate sustained income.

Jeffries (2001) notes that some public sector policies in several countries in the 1960s and 1970s were designed to produce spatial redistribution of tourism away from congested areas, sparking a trend towards managed tourism that would gain greater recognition with the advent of sustainable development years later. Although careful
tourism planning and development are key in the realisation of sustainable development, many tourism officials, primarily in the private sector, had not perceived environmentalism as an important duty. However, since the 1980s more public and political pressure has mounted against governments and private companies to become more responsible across a range of social and environmental issues (Swarbrooke, 1999). The concept of sustainable development, and in association, sustainable tourism, fits squarely into this movement. A growing number of governments and tourism operations now strive to make their planning and business activities more sustainable. However, Butler (1998) states that although adoption of the principles of sustainable development to tourism has been rapid and widespread, implementation of the practice has been much more laggard. Sustainable development has been criticized for its ambiguity, varying interpretations of the concept, and a lack of operationalization measures (Butler, 1993; Ioannides, 2001).

The term “sustainable tourism” has increasingly become a buzzword among academics and other professionals in the tourism industry since the early 1990s, and is now the broad research setting within which the tourism-environment relationship is investigated (Briassoulis & van der Straaten, 2000). Sustainable tourism development has its foundation firmly rooted in the concept of sustainable development, but with a tourism focus. Adding the tourism label to the concept emphasizes the need to satisfy both host communities and tourists while protecting and enhancing future opportunities. More precisely, sustainable tourism development strives to:

... meet the needs of present tourists and host regions while protecting and enhancing for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while
maintaining cultural integrity essential ecological processes, biological diversity, and life support systems (WTTC, WTO, and the Earth Council, 1995, p.30).

Emphasising the significance of a high quality natural and cultural environment, the ideal of sustainable tourism reflects changes in consumer preferences, which has reinforced the importance of the environment as the most critical element of the tourism product (Briassoulis & van der Straaten, 2000). In keeping with these changes, Hawkes and Williams (1993) state the concept of sustainable tourism embodies a challenge to develop the world's tourism capacity and the quality of its products without adversely affecting the environment that maintains them while not impeding its ability to sustain them. Perez-Salom (2001) suggests an encompassing articulation of sustainable tourism which represents a more holistic, comprehensive, and participatory approach to tourism that is environmentally, socially, and culturally compatible and favours a long-term perspective.

Sustainable tourism has come to represent a set of principles, policies, and management schemes that attempts to enable tourism development to protect a destination's environmental, social and cultural resource base. Even though sustainable tourism is a relatively young concept, it has had many different perceptions in how it should be conceived. Clarke (1997) identifies four changes in the way in which sustainable tourism has been referred to since its inception. First, sustainable tourism was positioned opposite to mass tourism. Sustainable tourism was perceived to operate on a small scale, while mass tourism functioned on a large, unsustainable scale with dire environmental and cultural implications. Emerging in the 1990s, the second position suggested that instead of a dichotomy, a continuum of tourist types existed in which one
form could be adapted to another. However, scale was an important issue and the idea that sustainable tourism should be an end-point of success still existed. A third position replaced this notion, which now suggested that mass tourism could be made more sustainable, and sustainability should be the goal rather than a definable end-point or measure of success for small-scale operations only. This position led to the development of guidelines, codes of practice, and the encouragement of more sustainable practices by both producers and consumers. The fourth position is one of convergence, which maintains that sustainable tourism is applicable to all forms of tourism, regardless of scale or precise definition.

McCool and Moisey (2001) feel that sustainable tourism is a more gentle form of tourism, one that is smaller in scale, sensitive to cultural and environmental impact, and involves local people in policy decisions. While mass tourism is often perceived as being incompatible with the concept, some forms of small-scale operations (e.g. some forms of ecotourism) are viewed as being more in keeping with the ideal of sustainable tourism. Proper planning and control mechanisms geared towards developing a sustainable tourism product have given rise to an increase in these alternative forms of tourism which are less stressful on the environment and host culture than mass tourism. However, Swarbrooke (1999) suggests that perhaps it is better to think that all forms of tourism can be made sustainable, or at least more sustainable, and Eccles and Costa (1996) assert that sustainability should be seen as a fundamental requirement for countries attempting to develop their tourism industry. However, it remains questionable whether the same sustainable development-oriented policies can work in different geographical regions and at different scales of development.
2.2.3 Barriers to Sustainable Tourism

Although the principles of sustainable tourism have received much support globally, there remain real difficulties and barriers in the practical implementation of relevant policies. First, sustainable tourism seems to be an exceedingly complex concept with varied definitions due to different interpretations of the meaning and use of the concept (McKercher, 1993). Welford, Ytterhus, and Eligh (1999) state that quite expectedly, the concept of sustainable tourism has not been precisely defined and, like its roots in sustainable development, the term is open to wide interpretation. Unfortunately, the lack of widely known and accepted definitions has lead to some confusion of what sustainable tourism means. Muller (1994) suggests that the objective of sustainable tourism is to influence these factors: economic health, subjective well-being of the locals, unspoilt nature and protection of resources, healthy culture, and the optimum satisfaction of guest requirements. Thus, the desired situation is balanced tourism development in which no one element, whether it is environmental protection, visitor satisfaction, or economic health, predominates over the others.

However, Hunter (1997) argues that the concept of balancing all goals is unrealistic, since competing aspects are often traded-off and priorities emerge which skew the decision-making in favour of certain aspects. Hunter (1997) believes that sustainable tourism should be regarded as an adaptive paradigm capable of addressing very different situations, and articulating various goals in terms of the utilization of resources. Hunter (1997) states that perhaps the most appropriate way to perceive sustainable tourism is not as a narrowly defined concept reliant on a search for balance, but instead as an over-arching paradigm within which several different development
pathways may be legitimized according to circumstance. Put simply, there may be a need to consider factors such as supply, demand, host community needs and desires, and a consideration of impacts on environmental resources. As well, location-specific factors, such as environmental characteristics and existing tourism developments should be considered.

Hunter (1997) surmises that sustainable tourism research would benefit from a closer inspection of the broader sustainable development literature which demonstrates a greater flexibility in determining potential development pathways. Welford et al. (1999) corroborate that the difficulties inherent in controlling tourism in a sustainable manner are indicative of the basic problems incurred in moving towards sustainable development. It also is suggested that sustainable tourism research should encompass a more penetrating appreciation of the complexities inherent in human and environment interactions. This would allow for more detailed analyses of the level of precaution to be adopted in potential environmental management techniques.

Hunter and Green (1995) argue that a number of other inter-related difficulties are inherent within sustainable tourism, including ignorance of tourism's impacts, diversity of interests and attitudes, and the diversity of the tourism industry itself. There are many stakeholders involved within the domain of sustainable tourism, including: the host community, tourists, government bodies, non-government entities (e.g. environmental/human rights groups), tourism industry (operators), and experts/academics. These stakeholders encompass a complex web of interested parties, which results in difficulty in reaching a consensus on what sustainable tourism means and how it can be achieved (McCool, Moisey, & Nickerson, 2001; Swarbrooke, 1999). Many of these stakeholders
have different goals, ethics, ideals, and motivations, ultimately leading to conflict when trying to plan and practice sustainable tourism. As well, Ioannides (2001) observes that the implementation of sustainable tourism has proven largely unsuccessful because in most destinations the sector is extremely fragmented and dominated by small businesses and changing stakeholders. Quite often the stakeholders in the tourism industry have a short-term perspective and are not as concerned about the overall local impacts of the industry and long-term prospects.

Hunter (1997) argues that the majority of work published under the title of sustainable tourism obscures detail behind the rhetoric of balance and impressions of environmental stewardship. It is impossible to imagine any type of tourism activity which is developed and operated without in some manner reducing the quantity or quality of natural resources in that location (Welford et al., 1999). Some authors have criticized sustainable tourism for being defined in a parochial, sectoral sense (Butler, 1997; Hunter, 1997; Hunter & Green, 1995). They argue the concept, although originating from sustainable development, emphasises growth in order for business viability to be maintained and developed, thus it has its own tourism-centric agenda (Hardy & Beeton, 2001). In exploring the theoretical divide between sustainable development and sustainable tourism, Sharpley (2000) suggests that "despite its appearance as a holistic, equitable and future-oriented development strategy, sustainable tourism development has a largely inward, product centred perspective" (p.14). Similarly, Hunter (1997) and Wall (1997) argue that sustainable tourism has emphasised the development aspect of sustainable development, altering its focus from environmental safeguarding and
sustaining indigenous cultures and local well-being, to focus on business development and economic growth of the tourism industry.

The paradigm of sustainable tourism also has received criticism because it neglects to provide a conceptual vehicle for policy formulation which explicitly connects the concerns of tourism sustainability with those of sustainable development more generally (Hunter, 1997). Welford et al. (1999) concur that a great deal of obscurity surrounds sustainable tourism, as it is often not translated into useful action because endless theories regarding the concept have not been operationalized, mainly due to a lack of clear goals. Welford et al. (1999) posit that both the production and consumption sides of the activity are not truly linked in the goals of sustainable tourism, and therefore transmit inadequate signals to each other. Swarbrooke (1999) notes that emphasis needs to shift from strategy generation to implementation for there are many sustainable tourism strategies in destinations, but as yet few examples of successful initiatives. Butler (1998) agrees that the overwhelming appeal of sustainable tourism lies in the generality of the concept, while the true costs of the implementation of the concept have never been clearly outlined. Butler (1998) explains that where the costs are perceived to be a reduction in development, meaning fewer tourists, less employment and lower income, then the concept is not supported enthusiastically. In such scenarios, sustainable tourism is interpreted in terms of economic sustainability, wherein the primary concern is maintaining the long-term viability of the economy, as opposed to the viability of physical and social environments.
2.3 Tourism Impacts

Tourism is one of the largest and fastest-growing sectors of the global economy, serving as a major source of employment and income for both developed and developing nations alike. In its long-term growth forecast, the World Travel Organization (1999) predicts that the tourism industry will expand by an average of 4.1% per year over the next 20 years, reaching over a billion international travellers by the year 2010, and 1.6 billion travellers by the year 2020. As greater numbers of people travel to farther regions, greater impacts are forced upon the natural environment and host communities.

Over the past few decades, the travel-related prospects of increased foreign revenue, higher levels of income and employment, as well as greater public sector revenues, were all attractive forces that convinced many governments to permit the development of new destination regions (Archer, 1996). Unfortunately, tourism's unprecedented growth and associated development was conceived as short-term financial gain, without due regard for long-term environmental or socio-cultural implications. As a result, many tourist developments have had detrimental consequences on the physical environment and host populations. Hence, the paradox of tourism has been revealed; that is, the industry has the profound potential to contribute economically, yet fast and sometimes uncontrolled growth can be the primary cause of degradation of the physical environment, in addition to a loss of local identity and traditional cultures [Convention on Biological Diversity (CBD), 2001]. This relationship between economic growth and environmental quality suggests a pressing need to provide credible, well-researched information that will help business and governments modify or abandon old policies,
develop new ones, and provide insight into methods of stepping towards sustainable tourism practices (Haywood, 1993).

Due to the rapid growth of this industry, there is considerable concern among researchers, planners, developers, and citizens about the potential current and future environmental impacts of tourism, especially since there is an increasing focus on travel and visitation to the natural environment. Increasing numbers of tourists who travel to both extensively developed areas or remote exotic locations are causing direct and indirect effects on the natural environment, of which the consequences are becoming more and more apparent. In popular resort areas like Cancun and Hawaii, overbuilt beachfront hotels have contributed to beach erosion, flooding and the disappearance of natural wetlands, generating mountains of garbage without adequate means of disposal [The International Ecotourism Society (TIES), 2002]. In such areas with high concentrations of tourist activities and appealing natural attractions, improper waste disposal is a serious problem and can be a major despoiler of the natural environment.

Tourism activities also have a major impact on the marine and coastal environment, most often due to inappropriate planning, irresponsible behaviour by tourists and operators, and/or lack of education and awareness of their impacts (CBD, 2002). The tourism industry generally overuses water resources for accommodation and attraction purposes (e.g. hotels, swimming pools, golf courses, personal use of water by tourists), which can result in water shortages and degradation of water supplies, as well as generating a greater volume of waste-water [United Nations Environment Programme (UNEP), 2002]. The disposal of untreated effluents into surrounding rivers and seas can
cause eutrophication and it also introduces a large amount of pathogens into the water body (CBD, 2002).

The direct use of natural resources (both renewable and non-renewable) in the construction of tourism and recreational facilities has been identified as one of the most significant direct impacts of tourism (CBD, 2002). Construction activities and infrastructure development involved in the provision of tourist facilities can lead to land and soil degradation, loss of wildlife habitats, deterioration of scenery, and intensified pressure on fossil fuels (UNEP, 2002). Tourism also can create great pressure on these local resources such as energy, food, and raw materials, which may already be in short supply. This pressure is intensified during peak tourist seasons, when greater extraction and transport of resources aggravates the physical impacts associated with their exploitation (UNEP, 2002).

The activities of tourists within the destination zone can also degrade the physical environment causing many detrimental hazards. Improper tourist behaviours and unregulated tourism activities such as plant-picking, hunting and fishing cause direct impacts on species composition and on wildlife. Moreover, tourists and their methods of transportation can cause soil compaction and trampling of flora, as well as increasing the risk of introducing alien species while causing disturbance to the normal behaviour of animals (CBD, 2002). Ioannides (1995) also notes that a tremendous congestion of people and vehicles occurs in areas with high a tourist density leading to air and noise pollution.

Tourism development and its associated activities also have been criticized for causing adverse social impacts on the host community. The size, scale, and location of
tourism development have an impact on the social cohesion of the host destination, as tourism activities often lead to intergenerational conflicts and affect gender relationships. Perez-Salom (2001) documents several of these social impacts on local communities, including: social degradation and increased crime due to an influx of workers and tourists; communities which rely heavily on tourism become extremely vulnerable to changes in tourist patterns and preferences; increased prices and less accessibility to goods and services; and an overall lack of rights for local people when they become excluded from areas restricted to tourism. Although tourism had been perceived in the past as promoting inter-cultural understanding and political stability, by the 1970s more researchers were noting that tourism was having a detrimental impact on many host societies (Perez-Salom, 2001). Tourism may have a cultural effect on the indigenous people living in the area, in that the behaviours of tourists may influence traditional lifestyles and practices, often resulting in cultural erosion and loss or display of cultural activities (Perez-Salom, 2001). Dogan (1989) also criticizes tourism for this resulting loss of identity, stating that traditional societies often lose authenticity because local residents begin to emulate visitors who they believe represent a higher society. As well, the natural landscape and architecture of the local area is often replaced and overcome by sprawling monolithic structures constructed to house and serve tourists.

Costa and Ferrone (1995) suggest that hosts' perceptions of tourists are influenced by their socio-cultural background as well as the level of change and impacts accrued to tourism. Local inhabitants' perceptions can influence the success of the tourism development, as Costa and Ferrone (1995) observe that those who live with tourism on a daily basis (i.e. local residents) are more acutely aware of its negative
impacts. As well, Perez-Salom (2001) points out that tension and conflict between hosts and guests can arise due to differences in language, religion, and customs. Din (1989) notes that encounters between tourists and locals are hardly balanced meetings, especially in third world destinations, because the tourists are usually quite wealthy while the workers and hosts are poor.

2.4 Government Tourism Planning and Regulation

In most regions, it is government agencies that are responsible for the planning and regulation of the industry. Governments are the legitimate holders of power in the political system, responsible for making policy decisions and establishing procedural guidelines (Elliott, 1997). Jeffries (2001) observes that the great complexity of tourism products and processes calls for coordination and cooperation, which arguably only governments have the authority and resources to organise. Tourism is developed and controlled by the government, whose primary role is governance - the enactment and implementation of laws and regulations. However, governance also involves incorporating more stakeholders and broadening decision making. Box (1998) suggests that governance is "intended to include the entire range of activities of citizens, elected representatives, and public professionals as they create and implement public policy in communities (p.2). The precautionary principle introduces new challenges to governance that includes more than new decisions and rules, it embodies a learning process in public policy, industry, science, and society - and involves a greater willingness to acknowledge the possibility of surprise [European Environmental Agency (EEA), 2001].
A wide range of government organisations, departments, and ministries are involved in tourism planning and management and are found at all levels of government including international, national, state/regional, and local. Inskeep (1988) notes that limited tourism planning at the international level is accomplished by organizations such as the World Tourism Organization, but such planning is usually weak because it requires the cooperation of numerous member countries. At the national scale, tourism planning usually involves the formulation of tourism development policy and strategy, physical structure plans, and methods of policy implementation (Inskeep, 1988). The regional/state level of tourism planning is more specific, as it identifies regional policies and strategies, types of tourism development permitted, regional tour patterns, and also recommends techniques for implementing tourism plans (Inskeep, 1988). Although environmental protection is a responsibility at all levels of government, it is at the regional level that greatest tourism planning integration can be realized (Gunn, 1993). Thus, the regional government tourism departments constitute the senior, policy making element, with subsidiary bodies to take care of operations (Jeffries, 2001). Moreover, the devolution of central government powers from the early 1980s has increased the importance and role of the regional dimension of tourism, especially in European nations (Jeffries, 2001).

Since participation in tourist activities is dispersed across the globe and comprises multiple regions of origin and destination, it involves multiple levels of control and regulation. Thus, the task of regulating the consumption and development patterns of tourism demands intervention at the global, national, and regional scales of intervention (Hughes, 1995). Inskeep (1988) notes that in tourism planning, the government tourism
agency is responsible for achieving implementation yet due to the many inter-sectoral linkages of tourism, various government departments and private agencies are usually involved, thus planning for it is complicated and involves both physical and institutional elements. Inskeep (1988) asserts that tourism requires systematic planning so that it is developed and controlled properly, responsive to market demands, and integrated into the total development pattern of an area.

Public sector agencies are involved in the management of tourism partly due to their public responsibilities including citizen and environmental welfare, but primarily because they expect the economies to benefit from tourism as the industry's multiplier effect brings development, growth and employment to the region (Elliott, 1997). As such, governments are responsible for the implementation and enforcement of five general, normative principles: public interest, public service, effectiveness, efficiency, and accountability (Elliott, 1997). Within the fifth principle, accountability, are included the functions of control, monitoring, answerability, and evaluation. Control systems seek to ensure that sustainable development occurs on ecological, economic, and social grounds, with appropriate balance between short- and long-term objectives (Elliott, 1997).

Regardless of the level of authority governing tourism decision-making, Edgell (1999) asserts that policy determines the goals and objectives and provides guidance for tourism development. An important antecedent to planning is policy, and nations are increasingly identifying policies for tourism development and management (Gunn, 1993). However, Edgell (1999) notes that very little has been written about the process for making policy decisions in tourism, as most countries base policy decisions on two primary goals: maximising tourist arrivals and increasing the inflow of tourist dollars.
Ioannides (1995) suggests it is time for national and regional governments to adopt a more critical attitude toward tourism and acknowledge that economic objectives can no longer solely direct the path of tourism development. Instead, Ioannides (1995) argues that from an early stage policymakers must also account for the negative repercussions on the physical, social, and cultural environments. Ioannides (1995) believes that planners should recognize that the key to maximizing tourism's returns while avoiding the downside of any resort cycle is to target and carefully monitor the development of a sustainable product.

Many policy makers have regarded international tourism as a primary yet ambivalent economic growth strategy for third world nations (Britton & Clarke, 1987). However, the industry's early advocates who praised its potential for economic growth and diversification have been replaced by a vocal body of critics who regard tourism as an unsound economic development strategy who believe the industry's costs outweigh the benefits (Conway, 1983; Ioannides, 1995). Tourism is, by nature, an unreliable, cyclical and vulnerable industry, yet is often predicated as an economic development solution, both in developed and undeveloped countries. Often, tourism is exploited to boost employment and local infrastructure, but problems occur when the development is rushed and does not consider the product's life cycle or the environment (Eccles, 1995; May, 1991).

Pearce (1989) observes that assessing and understanding tourism's environmental impacts are especially critical in developing countries, where success in tourism is often reliant on fragile ecosystems not appropriate for massive development and abuse. As well, relaxed land-use planning regulations in many developing countries has led to
disorganized and unsuitable tourist developments that do not include necessary infrastructure improvements (Peterson & McCarthy, 1990). The prospective economic benefits of tourism activities, rather than the goal of resource protection, often influence the internal policies of government (Edgell, 1999; Gunn, 1993). Perez-Salom (2001) asserts that from an early stage, policy makers must not base decisions on economic objectives alone, but must also account for the negative ramifications on the socio-cultural and physical environments caused by tourism development. However, Gunn (1994) asserts that although vast numbers of tourists certainly lead to resource degradation, “most environmental damage is caused by lack of plans, policies, and action to prepare for any economic growth, not just tourism” (p. 83). Gunn (1994) maintains that failure by governments and private sector leaders to cope with economic growth is at the heart of the issue, coupled with the common problem that those who profit from the tourism development are often not held accountable for their projects’ environmental calamities.

Within tourism development planning, Jenkins (1999) suggests that a “great divide” exists between tourism academics and tourism practitioners. He proposes that academics’ research would be more effective if less concern was given to impacts and more attention was given to the process of practical implementation. As the planning process is critical in the management of the tourism industry, it can be used to formulate and implement current and future policy, as well as to achieve stated objectives (Elliott, 1997). However, McCool and Moisey (2001) observe that in most cases, conflicting goals, lack of scientific agreement on cause-effect relationships, and differing perceptions on the degree of acceptable change or impact characterize modern tourism planning.
Thus, McCool and Moisey (2001) call for more inclusive and integrative planning processes, as well as appropriate organizing frameworks for managing impacts, in order to move towards sustainability. Edgell (1999) asserts that managing sustainable tourism is reliant on "futuristic policies and sound management philosophies including a harmonious relationship among local communities, the private sector, and governments in developmental practices that protect natural, built, and cultural environments compatible with economic growth" (p.50). Eccles (1995) notes that some development problems can be resolved, by responsive tourism planning as well as by government and industry working towards sustainability.

2.5 Tourism Planning Tools

Today, greater emphasis is directed at ensuring that tourism is planned, developed, and operated within the realm of sustainable development and that practical tools are used to convey sustainability objectives. Butler (1997) states that in order for sustainable tourism development to begin to occur, regulation and control are two key elements that must exist. These elements lead to the possibility of balanced development, which then leads to the propensity of sustainable tourism. To achieve this, practical planning tools are required that integrate the twin objectives of environmental sustainability and economic profitability. Some planning mechanisms currently used when planning sustainable tourism development include carrying capacity, the ecological footprint, environmental impact assessment (EIA), environmental auditing, and Butler’s model of tourism life cycle. The precautionary principle constitutes a potential planning mechanism for tourism that embodies many characteristics of these current tools.
One method used in environmental analysis to measure and reduce impacts is by identifying the carrying capacity of a location, an essential element of environmental planning for tourism (Getz, 1983). The concept of carrying capacity has played an important role as a management tool in the debate over how to best determine environment impacts and maximum stress levels an area can accommodate (Hjalager, 1997; Lindsay, 1986). While carrying capacity is a useful concept, it embodies some problems which require resolution if it is to be used in a practical manner to help develop sustainable tourism. Wight (1998) observes that despite its advocacy, carrying capacity has very limited application in the domain of sustainable tourism, while McMinn (1997) states that one of the major problems in assessing carrying capacity is determining the specific indicators in such terms that measurements can be carried out and limits established. While some elements of the environment are easier to measure (e.g. volume of tourists that an area can physically accommodate without detriment to the environment), other elements, particularly those associated with the social environment, are extremely difficult to measure.

The measurement of carrying capacity can therefore be vague when considering the many different factors in the location, the philosophical and ethical issues involved in determining how the physical limits are established, and who is entrusted with the responsibility of making the decisions. As a result, it is unlikely that the carrying capacity will be the same in any two places, so its measurement and application must be site-specific, while at the same time very difficult to forecast (Swarbrooke, 1999). Hjalager (1997) argues instead that only for well-defined areas (e.g. provincial or national parks)
has it been possible to develop the tool to such an extent that it can be classified as an integrated management system.

Another planning tool related to carrying capacity is the ecological footprint, an instrument that purports to translate sustainability concerns into public action and assist in decision-making. Ecological footprint analysis is an accounting tool that measures accounts for the flows of energy and matter to and from any defined economy and converts these into the corresponding land/water area required from nature to support these flows (Wackernagel & Rees, 1996). However, the ecological footprint measures land area required per person (or population), rather than population per unit area which characterizes traditional carrying capacity measurements. Although further refinement is required to develop the tool’s full potential for planning practitioners’ everyday decisions, it has been applied in helping to frame sustainability issues and solutions in Canada and several other countries (Wackernagel & Rees, 1996). Ecological footprint analysis (EFA) has received some attention as a concept to be used in assessing sustainability in tourism (e.g. Gössling, Hansson, Hörstmeier, & Saggel, 2002).

For instance, in their study examining the ecological footprint analysis (EFA) as a concept to assess sustainability in tourism, Gössling et al. (2002) found that the major environmental impact of travel was a result of transportation to and from the destination, as more than 97% of the energy footprint was a result of air travel. Unlike other tourism planning tools which tend to focus on changes occurring only in the local environment, the ecological footprint also takes into consideration the global consequences of travel (Gössling et al., 2002).
Environmental impact assessment (EIA) is another important planning tool that has been more recently incorporated into the tourism development process (Fennell, 1999). Essentially, EIA involves predicting and evaluating the impacts of specific developments or actions on the environment. Wight (1998) notes that EIAs identify ways of improving projects environmentally by preventing, mitigating, or controlling for negative impacts, and should begin when project planning begins and when project modification is still possible. However, Wight (1998) notes that EIA practices have rarely been able to integrate environmental, social, and economic issues successfully, and often are perceived as a barrier to development (by those with a vested interest in development), something to be overcome in order to continue development. In order to more effectively integrate these issues, Green and Hunter (1992) advocate incorporating more subjective assessments, suggesting that greater emphasis be placed on gathering qualitative data from key stakeholders in order to direct the more quantitative elements of EIA.

Another tool used in tourism development is environmental auditing, a process where operations of an organization are monitored to determine whether they are in compliance with regulatory requirements and environmental policies and standards (Pigram, 1996). In the context of sustainable tourism, the principal objectives of environmental auditing are to identify and document the environmental compliance status of tourism developments and operations, and to provide an effective means of supervising environmental performance (Pigram, 1996). Issaverdis (2001) notes that environmental audits have similar objectives to environmental impact assessments and the two processes should be seen as complementary in achieving sustainable tourism
practices. Issaverdis (2001) suggests that environmental sustainability and long-term commercial success of the tourism industry requires the establishment of effective benchmarking, accreditation, best practice and auditing procedures. Unfortunately, the expertise and commitment of resources required to raise environmental performance means that the adoption of best practice environmental management is often "a minority activity, confined, in the main, to a few large firms" (Goodall, 1995, p. 34).

Lastly, Butler's (1980) resort cycle model of tourism represents a valuable tool that enables planners to understand the dynamic character of tourist destination areas (Perez-Salom, 2001). Butler's resort cycle model depicts how destinations follow six distinct stages: exploration, involvement, development, consolidation, stagnation, and decline or rejuvenation. Haywood (1986) observes that planners could use the model most effectively by avoiding a destination-specific approach, and instead develop a typology of potential resort cycle scenarios based on different types of destinations. Cooper (1997) suggests that when devising strategies to promote balanced, sustainable tourism growth, policy makers should be cognizant of the temporal context (i.e. tourism area life-cycle stage) in which the tourism development is taking place. Cooper notes that the resort cycle can be used in conjunction with strategic planning, that for every stage of the cycle certain strategic possibilities are available that allow the destination to remain competitive and approach sustainability. Similarly, Ioannides (2001) demonstrates value in this model, suggesting that planners, policy makers, and other professionals must recognize the locality's individual life cycle stage and perceptions of different stakeholders when attempting to implement overriding sustainable development objectives.
2.6 Origins of the Precautionary Principle

As mentioned earlier, growing emphasis is being directed at ensuring that tourism is planned, developed, and operated within the realm of sustainable development and that practical tools are applied when implementing sustainable tourism practices. Although the aforementioned planning tools have received attention and at times application, there remains the need to explore other potential planning mechanisms that can aid in tourism planning and development. One possible planning tool for tourism is the precautionary principle, which has been implemented as a regulatory guideline for environmental policy making and managing human health and environmental hazards in numerous regions around the world. The principle has been examined at most of the recent international environmental forums (Freestone & Hey, 1996), and has been regarded as the most notable anticipatory policy existing in international law with particular application for environmental problems caused by humans (Gollier et al., 2000). Due to tourism’s close link with the natural environment and the industry’s rising popularity (especially among nature-based activities), the question arises as to the relevancy of the precautionary principle in its application to managing/regulating tourism activities.

The precautionary principle first emerged in Germany during the 1970s in response to continued environmental and human health impacts caused by weak pollution control legislation (Tickner & Raffensperger, 1998). Germany was trying to find the most appropriate method of dealing with a variety of environmental hazards that included acid rain, North Sea pollution, and global climate change (deFur & Kaszuba, 2002). To deal with such impacts and mitigate further damage and future hazards, the precautionary principle was introduced as Vorsorgeprinzip, usually translated as the "precaution" or
"foresight" principle (VanderZwaag, 1994). In 1976, the precautionary principle was enunciated into German national law: "Environmental policy is not fully accomplished by warding off imminent hazards and the elimination of damage which has occurred. Precautionary environmental policy requires furthermore that natural resources are protected and demands on them are made with care" (as cited in VanderZwaag, 1994, p.3). The precautionary principle was predicated on the belief that economic development and environmental resource protection are mutually supportive, and that exercising foresight and careful planning could potentially avoid harmful activities and environmental damage (Boehmer-Christiansen, 1994).

Boehmer-Christiansen (1994) contends that Vorsorgeprinzip was intended to act as a philosophical principle and persuasion mechanism to justify environmental protection, with no legal basis required to scientifically link cause to harm before action is taken. However, Boehmer-Christiansen (1994) also argues that the concept of Vorsorgeprinzip has a broader meaning, much more than the principle of foresight planning, as it also includes the early detection of health and environmental hazards by research, the notion of cost-effectiveness, and emphasises mankind's ethical responsibilities to safeguard nature. Boehmer-Christiansen (1994) points out that Vorsorgeprinzip is only one of five basic principles of German environmental policy and that it was conceived as a way of countering the domination of the other principles, namely the polluter pays principle (Verursacherprinzip), the consensus principle (Kooperation), the principle of proportionality in cost and gain (Wirtschaftliche Vertretbarkeit) and the common burden principle (Gemeinlast Prinzip).
2.6.1 International Introduction

The precautionary principle was first introduced internationally (although it was not mentioned specifically in name) at the First International Conference of the North Sea, which took place in Bremen in 1984 (Douma, 2000). In a newspaper article, Glover (1988) reveals that for decades the North Sea had served as an ocean dumping ground for nitrogen and phosphorous wastes and for many of Europe's polluted rivers. The principle was introduced to address uncertainty regarding the potential impacts of continued waste dumping causing the deteriorating quality of the North Sea, which had continued to decline due to the ineffective regulation of both land based pollution and ocean dumping by regional bodies. The principle also was in response to the ineffectiveness of traditional approaches to environmental regulation based on the assimilative capacity of the environment, which presupposed that although the capacity of the oceans was finite, actions were permissible unless evidence could be provided linking action to [Caribbean Environment Programme, (CEP), 1993]. For these reasons, governments of North Sea countries pushed to seek joint solutions to alleviate the problems (deFur & Kaszuba, 2002). At the Second International Conference on the Protection of the North Sea in 1987, the term “precautionary principle” was used explicitly in the Ministerial Declaration of the Conference, which states:

[The participants] accept the principle of safeguarding the marine ecosystem of the North Sea by reducing polluting emissions of substances that are persistent, toxic and liable to bio-accumulate at source, by the use of the best available technology and other appropriate measures. This applies especially when there is reason to assume that certain or harmful effects on the living resources of the sea are likely to be caused by such substances, even where there is no scientific evidence to prove a causal link between emissions and effects (‘the principle of precautionary action’) (MINDEC, 1987).
Subsequent ministerial declarations in 1990 and 1995 reaffirmed precaution as a guiding principle (Science and Environmental Health Network [SEHN], 2003).

VanderZwaag (1994) states that the practical implications of the precautionary principle have become most clear in the context of marine pollution caused by ocean dumping (e.g. North Sea), while outside this domain application of the precautionary principle has been more elusive. However, the principle’s consolidation into the Rio Declaration on the Environment and Development as Principle 15 demonstrates that it can have application to the entire spectrum of environmental policy making and address various forms of human impacts on the environment (CEP, 1993). In 1992, the precautionary principle was incorporated into the Rio Declaration on the Environment and Development:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (Van Dyke, 1996, p.10).

Since the principle's first introduction and application to the North Sea, it has become part of many international agreements and environmental legislation in more than 40 countries (Rogers et al., 1997). Notable examples of the acceptance of this principle include: Ministerial Declarations of the International North Sea Conferences, 1995, 1990, 1987; Protocol on Substances that Deplete the Ozone Layer, 1987; Paris Convention for the Prevention of Marine Pollution from Land-Based Sources, 1989; Bergen Ministerial Declaration on Sustainable Development in the ECE Region; UNCED Text on Ocean Protection, 1991; the Rio Declaration on Environment and Development 1992; Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 1992; Framework Convention on Climate Change, 1992; Convention

VanderZwaag (1999) asserts that the precautionary principle is positioned to stay within contemporary environmental policy.

2.7 *The Precautionary Principle*

2.7.1 *Definitions and Core Elements*

Today, the precautionary principle is seen as a key concept in the field of environmental management and in scientific investigation (Counsell, 1999). The precautionary principle is unique in that it recognizes the limitations of contemporary scientific methods and data; in essence, promoting regulatory action to preclude or avoid environmental harm before it has occurred, even in the absence of scientific evidence linking cause-effect relationships (Santillo et al., 1998). O'Riordan and Cameron (1994) describe the precautionary principle as "a culturally framed concept that takes its cue from changing social conceptions about the appropriate roles of science, economics, ethics, politics, and the law in pro-active environmental protection and management" (p.12). Emphasising responsibility and sound practice, the precautionary principle has been extended to include the following core elements (O'Riordan & Jordan, 1995, p.195):

(i) **Pro-action**: This involves preventative anticipation, or a willingness to take action in advance of formal scientific proof on the grounds that further delay or careless action may prove far more costly to society and nature in the long-run.

(ii) **Cost effectiveness of action**: That is, some consideration of proportionality of response or cost-effectiveness of error. This element seeks to show that the selected degree of restraint is not unduly costly.
(iii) **Providing ecological margins of error:** Involves safeguarding ecological space by showing how natural systems and social organisations are resilient or vulnerable to further change. This element recognises that such margins of tolerance should not be breached.

(iv) **Intrinsic value of non-human entities:** Promoting the cause of intrinsic natural rights and allowing natural processes to function in such a manner as to maintain the essential support for all life on earth.

(v) **Duty of care, or onus of proof on those who propose change:** A shift in environmental and financial responsibility onto the developer to show no reasonable harm exists before development proceeds.

(vi) **Concern with future generations:** Focuses on meso-scale planning, working to ensure the well-being of future society. This element recognises the need to shift the time-scale from immediate gratification and gain today to more concern and foresight planning for tomorrow.

(vii) **Paying for ecological debts through strict/absolute liability regimes:** Burden-sharing responsibility for those who were not cautious or caring in the past. This involves compensating for past errors of judgement based on ignorance or an unwillingness to assume an unclearly stated sense of responsibility for the future.

VanderZwaag (1999) observes that the precautionary principle embodies a new shift in environmental policy, which recognizes that rather than react slowly to environmental pollution which is scientifically identified, policy makers should be more cautious and proactive in preventing pollution even if scientific uncertainty exists. Raffensperger (2002) agrees that the precautionary principle is decidedly different from the current approach to environmental decision-making. First, the principle couples science with ethics, requiring policy makers to attach values to decision making. Second, the precautionary principle goes beyond traditional measure-and-manage-risk methods, which presumes one can predict the full range of consequences and later modify systems to cope with the resulting harms.
Raffensperger (2002) suggests that methods for implementing the precautionary principle work best within the context of a goal or a vision guided by values. Indeed, the values attached to the environment and human health risks must be considered when determining when to implement the precautionary principle in decision-making. Myers (2002) states that the precautionary principle is more than taking precautions; it is about including values in policy choices, and represents an explicit endorsement of certain values. Myers (2002) asserts that the precautionary principle may be most effective if certain values, described as goals, are permitted to guide the decision-making process from start to finish. Kaiser (1997) agrees with this statement, noting that the degrees to which we are prepared to take precautionary environmental action is closely related to the values attached to environment and to society. As well, deFur and Kaszuba (2002) point out that decisions involving regulation are easier and more widely accepted when the resource being protected is commonly valued.

Paramount to the concept of precaution is the need to make decisions that favour environmental caution and protection. Myers (1993) contends the precautionary principle dictates there should be "a premium on a cautious and conservative approach to human interventions in environmental sectors that are (a) unusually short on scientific understanding, and (b) unusually susceptible to significant injury, especially irreversible injury" (p.74). Myers (1993) observes that the precautionary principle is evolving as a guideline for policy makers when making decisions over environmental problems, and suggests that the precautionary principle will become increasingly more pertinent as disruptive environmental impacts continue to mount. Underwood (1997) concurs with
this view, stating that "increasingly, environmental decision-making is scrutinised with respect to a precautionary principle" (p.137).

In an assessment of seven case studies which involved the application of the precautionary principle to environmental decision-making, deFur and Kaszuba (2002) found that long-term resource condition or outlook was the most common aspect and the most compelling issue that affected final decision-making. deFur and Kaszuba (2002) suggest concern over long-term outcomes is critical because of limited experience for many situations, accentuated by the fact that the modern era has encountered alterations at a scope and scale never envisioned a few decades ago. Taking action to prevent future disaster and harm, even though cause-effect relationships are not fully established, is key to the precautionary principle. Nonetheless, even in cases where the implications of taking early action are identified (e.g. Canadian cod fishery collapse), limited action may be taken due to significant uncertainties and the high financial cost of taking action. Unfortunately, this may result in far higher costs when preventative measures prove inadequate and the anticipated impacts as well as unanticipated impacts occur (EEA, 2001).

Thiele (2000) states that the imperative of sustainability and the precautionary principle, which are future-focused and embrace an expanded time horizon, stand in distinct contrast to the contemporary powerful cultural forces encouraging unfettered economic and technological development. Thiele (2000) explains that although the science of ecology will continually increase in size and knowledge, environmentalists attribute three laws that encompass its scope and breadth: (i) the social and natural worlds are chiefly characterized by complex interdependence; (ii) every human action has an
ecological effect or cost; and (iii) the security, stability, and resilience of ecological systems derive largely from their diversity and complexity. Thiele (2000) observes that these laws encompass an acknowledgement of nature's interdependence and in conjunction comprise two normative implications: an imperative of sustainability and a precautionary principle. As such, the concept of sustainability is analogous to the precautionary principle, which Thiele (2000) acknowledges as a practical means of living under an expanded time horizon, by advancing with circumspection, and acting with restraint.

2.7.2 Forms of Implementation

Since 1987 the precautionary principle has gradually become a more recognised principle in international environmental law (Dickson, 1999). VanderZwaag (1999) observes that almost every recent international environmental agreement includes an articulation of the principle, and concurs that the argument in favour of a precautionary approach is gaining momentum in international environmental law. Ellis (2000) comments that the recent elevation of the precautionary principle to the level of a binding obligation in several international environmental conventions has been widely regarded as a notable achievement. As a result, Ellis (2000) believes that the principle may be considered in three different forms: as an influential paradigm, as an inspirational norm, and as a rule of law. First, the precautionary approach represents a new approach to traditional environmental decision-making, incorporating the varied and sometimes unpredictable effects of human actions with environmental protection considerations. Second, it can be considered as a norm that recognises a series of goals which decision-makers are encouraged to attain. Last, the precautionary principle can be expressed as an
imperative measure used to justify action (or inaction) rather than a conditional measure, thus enhancing the power of the precautionary principle through its articulation as a legally binding rule.

As the precautionary principle grows in global popularity and becomes increasingly debated among different sectors of society, questions have arisen regarding its operationalization and the best form of implementation. Although the precautionary principle provides little in the way of operational guidelines or rigid analytical schema, it has been accepted as a guiding principle by many national governments and international entities, such as the United Nations and the European Union (O'Riordan & Jordan, 1995). Gollier et al. (2000) contend that although devoid of practical content, the principle provides a conceptual foundation for environmental regulatory policy, and that more uncertainty should induce decision-makers to implement conservative decisions at present.

However, opinions on whether the precautionary principle is enforceable and legally binding differ considerably. For instance, Douma (2000) examined several instances of environmental law involving the precautionary principle which were analysed by the European Courts (e.g., driftnets ban, GM maize, antibiotics in animal feed). Douma (2000) noted that some felt the precautionary principle was simply a general guideline for environmental policy decision-making, while others viewed the principle as a legally binding norm that establishes criteria for environmental policy. Douma concluded that the principle was a legal norm that can be enforced, and that community institutions should be under legal obligation to base their environmental policy on the precautionary principle. Similarly, Foster et al. (2000) assert that the
precautionary principle is enshrined in international law and is destined to remain a permanent component in environmental and health protection.

2.7.3 Framework for Application

In order to apply the precautionary principle as a tool of modern environmental planning, researchers and organisations must continue to identify guidelines and develop frameworks for its application. In February 2000, the European Commission released a Communication on the Precautionary Principle, which identified how the Commission will implement the principle and established guidelines for its application (Carr, 2002). The European Commission (2000) posits that where action is deemed necessary, measures based on the precautionary principle should be (as cited in the European Commission’s Communication on the Precautionary Principle, 2000, p. 96):

- Proportional to the chosen level of protection
- Non-discriminatory in their application
- Consistent with similar measures already taken
- Based on an examination of the potential benefits and costs of action or lack of action (including, where appropriate and feasible, an economic cost/benefit analysis)
- Subject to review, in the light of new scientific data; and
- Capable of assigning responsibility for producing the scientific evidence necessary for a more comprehensive risk assessment.

A framework for precautionary decision-making also was proposed at the Wingspread Conference (1998), which established pollution prevention and clean production as primary in all corporate decisions (see Tickner & Raffensperger, 1998). Bonner (2001) notes that at this conference, delegates (who included numerous activists, scientists, and policy makers from five nations) examined a varied collection of health and environmental problems as proof that scientific evidence is dispensable (Tickner & Raffensperger, 1998). The framework developed at this conference has been described as
a method of implementing the precautionary principle into day-to-day environmental decisions (Tickner, 1998).

The following framework (adapted here from Tickner, 1998) includes nine proposed steps for incorporating the precautionary principle into better tourism industry decision-making as cited in Fennell and Ebert (in press):

1. *Define the general duty to take precautionary action.* This involves the adoption of a corporate or industry wide duty to take precautionary action in the face of scientific uncertainty where there is a threat to human health or the environment. The concept of human health could be expanded to include an assessment of how tourism developments, for example, have transformative impacts on the ecology and customs of local communities.

2. *Set aggressive goals/vision for achieving sustainability (backcasting).* This step involves the establishment of clear and measurable goals from which to drive innovative best practices within the industry. The establishment of vision statements, which cut across sectors of the tourism industry, and which provide the mechanism by which to develop effective goals and objectives, should be likened to a road map which provides a way to the future.

3. *Assume responsibility for demonstrating the safety of products and processes.* Tourism industry stakeholders involved in the planning, development and management of the tourism industry must demonstrate the safety of their operations before engaging in such activities. The choice of technology, materials, and products is paramount to demonstrating that their activities have a limited impact on people and natural resources.
4. *Create criteria for decision-making under uncertainty.* Companies will need to create and adhere to criteria which will guide decision-making where harm to people or natural resources is a possibility. Indicators of sustainability and other such tools will need to be employed for the purpose of determining how and what type of evidence to weigh in assessing impacts.

5. *Use tools for implementing precautionary, preventative approaches.* There are numerous tools for carrying out precautionary policies, including (1) clean production and pollution prevention, (2) corporate product phase outs, (3) strict standards within the firm, and (4) alternative assessments. The recent focus on environmental management systems will provide direction in this regard.

6. *Use the "polluter pays" principle.* This principle, which places responsibility on the shoulders of the offending party, demands that such parties pay the costs of the damage they cause. One mechanism which has garnered a high level of support is assurance bonding. Companies are required to pay a premium before undertaking a project, which is based on the worst potential damage that might occur from the development. If no damage occurs, the bond is returned to the developer.

7. *Develop a scheme to systematically evaluate alternative activities, technologies, chemicals, etc.* A systematic and comprehensive scheme must be initiated to examine the impacts of alternatives to potentially hazardous activities. This involves an examination of the entire life cycle of the product (see Butler, 1980). For example, in order to prevent an impact while creating another, developers must be careful that the substitutes they may use are not more harmful than the original product (e.g., an external wood product which although cheaper, is not able to withstand the conditions...
of the environment in which it is used). This becomes especially salient in a tourism context where tourism developments have life cycles of many years.

8. Assume a duty to monitor, understand, investigate, inform, and act. Tourism businesses have an obligation to investigate and understand their potential impacts, continuously. Ignorance is unacceptable. This calls for more science by which to understand how developments impact people, sites, communities, and regions. What is not measured cannot be managed. Consequently, companies should be responsible for periodic assessments and audits of their initiatives, over the long term. This means that communities must insist that developers must be accountable for their projects over the long run.

9. Employ participative corporate decision-making. Just as decision making within a firm is enriched by many perspectives, tourism industry development decisions must be open to those who are often affected by the initiative. This means involvement by the development firm, governments, community members, and so on. In particular, community experience-based judgement—and the socio-ecological values inherent in such judgement—may be essential in the transfer of knowledge between stakeholder groups.

In the current study, this framework was included as part of the survey instrument as participants were asked to rate the relevancy of each step, as it specifically applied to tourism. At this time, the precautionary principle is often envisaged as an important guiding principle for corporate environmental strategy (Raffensperger, 2002), yet its potential for implementation remains unknown. Research indicates that many difficulties have been encountered in applying the principle, namely the contrasting positions that
exist regarding the health and strength of natural systems to withstand shock, 
disagreement over the adaptive abilities of human societies to cope with change, and the 
varying degrees to which humans are future-oriented beyond one's lifetime (O'Riordan & 
Jordan, 1995).

2.7.4 Barriers to Practical Implementation

The varying definitions and differing views on the precautionary principle's main 
elements and goals emphasize some of the difficulties currently facing the concept. 
Bodansky (1994) observes that there are many complexities to overcome in order to 
advance the precautionary principle from a slogan into precautionary action, with perhaps 
it's greatest problem being the wide variability in interpretations and the lack of a 
consensual definition. It has become evident that the surge in popularity of the 
precautionary principle was not supplemented with a consensual definition of the 
principle (Dickson 1999). Much like sustainability, the precautionary principle is neither 
a well-defined principle nor a firm concept (O'Riordan & Jordan, 1995), and variance 
among definitions reflects uncertainty in its application (O'Neil-Coleman, 2002). Due to 
differing interpretations of the principle and its gradual acceptance into domestic and 
international law, O'Riordan and Cameron (1994) contend that "at present the line is to 
act prudently when there is sufficient scientific evidence and where action can be 
justified on reasonable judgements of cost effectiveness and where inaction could lead to 
potential irreversibility or demonstrate harm to the defenders and future generations" 
(p.18).
Given the principle's claimed importance, the lack of uniformity surrounding its formulation comes as a surprise (Manson, 2002). The precautionary principle has interchangeably been described with many labels (e.g. tool, mechanism, strategy), thus reflecting greater confusion and uncertainty in its practical usefulness and mode of implementation. As well, Kaiser (1997) accedes that the precise definition of the precautionary principle is far from clear, that even though it has acquired the standing of a political/moral norm, it remains vague in how it can be implemented in specific action. Kaiser (1997) goes on to question whether the precautionary principle can hold its intuitive appeal and be applied over competing environmental principles, especially when it is put into precise terms and applied to specific circumstances. Many of the legal instruments and cases citing the precautionary principle have defined and applied the principle in different ways, thus reflecting uncertainty in its application (Kaiser, 1997). With varied definitions (VanderZwaag [1999] identifies 14 different formulations of the principle in treaties and non-treaty declarations) prevalent among groups with very different ecological agendas, practical application is difficult and inconsistent, such as in the case of sustainable development. VanderZwaag (1999) concludes that fully understanding the applicability of the precautionary principle is impeded by four reasons including “definitional generalities, definitional variations, unresolved philosophical debates, and the vast spectrum of measures suggested to operationalize precaution” (p.358).

Variations in terminology reflect the controversy surrounding the precautionary principle and indicate the wide spectrum of positions and versions articulating the principle. Dickson (1999) suggests that two versions of definitions have become evident
since the concept's inception: "action-guiding" and "deliberation-guiding" versions. Essentially, the action-guiding version requires that something be done in response to the threat of harm, whereas the deliberation-guiding definition embodies no such protocol. The action-guiding definition is most often found in agreements dealing with marine pollution (e.g. 1989 Report of the Nordic Council's International Conference on the Pollution of the Seas), while the deliberation-guiding version does not directly call for action, but rather restricts what can be considered as a reason for inaction (Dickson, 1999). Examples of this version are prevalent in general environmental agreements, such as the definition provided in Principle 15 of the Rio Declaration on Environment and Development. Dickson (1999) also states that the degree of specificity often varies among formulations. Some principle definitions may focus on one certain element of the environment; a specific type of threat; or may articulate specific response actions to deal with threats.

Manson (2002) observes that due to its growing role in contemporary debates about environmental decision-making, a clear formulation of the principle is needed. In most versions of the precautionary principle, the goal or solution to alleviating the potential problem is the prohibition of the activity causing the negative effects. However, Manson (2002) points out that a wide range of actions may be taken under the principle, including: encouraging research on alternatives, trying to reduce uncertainty linking action to harm, and formulating ways to diminish the negative effects, or taking not action at all. VanderZwaag (1999) writes that different articulations of the precautionary principle vary in scope of activities covered and strictness of control measures required, compounded by the fact that a range of direct and indirect management measures are
used to address the precautionary principle. Direct measures would include zero
discharge of toxins; the manufacturing and marketing of only safe products; onus of
proof on developers to ensure no significant harm occurs; a requirement that regulators
apply the precautionary principle; licensing polluters on the basis of waste minimization
plans; and the requirement to apply best practices and best technology. Indirect measures
include stringent liability regimes; insurance funds to cover potential damages; increased
levels of public funding and participation; and comprehensive environmental impact
assessments.

VanderZwaag (1999) goes on to state that the precautionary principle is caught
between differing world views, suggesting that a group embodying strong ecological
values would lobby for extreme interpretations of the principle, such as prohibiting the
release of toxic chemicals, rejecting cost-benefit techniques to guide decisions, and
transferring the burden of proof onto those proposing change. On the other hand, a group
representing a more utilitarian and risk-taking viewpoint would push for moderate
interpretations, acknowledging the role of cost-benefit analysis and risk assessment.
Similarly, the precautionary principle holds different meanings based on the importance
associated with sustainability. O'Riordan and Cameron (1994) suggest that a very strong
sustainability approach favours a more fundamentalist mode of ecological solidarity with
the earth, which suggests that we should adapt to the frames set by natural systems and
build precaution into everyday living and actions that are more in tune with the natural
world. At the other end of the spectrum, very weak sustainability is based on the
presumption that losses of environmental resources can be made up by innovation,
ingenuity, and adaptation. In this mindset, precaution has a place, but is primarily
relegated to being a spur to innovation and managerial adaptation (O’Riordan & Cameron, 1994).

It has become evident that difficulty is encountered when regulators seek to implement the precautionary principle in decision-making. Although the precautionary principle describes how regulators should deal with uncertainty, it does not offer guidance in making some policy choices including: what precautionary measures should be taken or the level of threat required before action is taken, how many resources should be committed, or which negative impacts are the most important to avoid (CEP, 1993; Costanza & Cornwell, 1992). Kellow (1999) states that although the principle holds reason, it cannot be operationalized, since it fails to dictate how much caution should be exercised. Similarly, Rogers et al. (1997) state that the precautionary principle does not offer direct insights into how precaution is to be applied. Instead, the principle raises critical questions, including: what constitutes a serious threat; at what level of risk and uncertainty should rigorous precautionary measures be employed; how much is society required to pay to reduce the risk of serious damage; and how much environmental risk society is to willing to accept (Rogers et al., 1997). Counsell (1999) also states that the absence of leadership from government signifies the fundamental lack of agreement on the role of the precautionary principle and how to apply it in planning practices, difficulties magnified by the disputed meanings of sustainable development itself.

This review of the literature indicates that the precautionary principle holds varying interpretations and different meanings for various groups. As such, it would be fair to say that the use of the precautionary principle for regulatory purposes is highly controversial. Some stakeholders express trepidation in the misuse or abuse of the
precautionary principle, feeling that it could be applied to perceived risks for which there is no firm scientific foundation or unnecessarily suppress innovation or impose unmerited costs on sectors of society (Government of Canada, 2001b). Many European industries view the precautionary principle decreasingly as an acceptable risk management approach, and increasingly as a tool for the more radical environment and health advocates to compile political and public support (EEA, 2001). The precautionary principle has received criticism and backlash from numerous opponents, partly because it attempts to slow down surging growth and development. Such disenchantment is intensified both by less control over interpretation of “precaution” by regulatory bodies, and by seeing the precautionary principle become a feature of arguments employed by those with very different world views (EEA, 2001).

Those against the application of the precautionary principle in environmental, health, and safety regulation decry it as a threat to environmental protection and optimal safeguards for public health. Some believe that excessive application of the precautionary principle breeds over-cautiousness, limiting the possibilities for trial and error that are critical ingredients of progress, thus resulting in paralysis and stagnation (Labohm, 2003). Labohm argues that the application of the precautionary principle has been harmful to society, stating that reducing the use of DDT in developing countries of the Third World has led to the re-emergence of malaria. As well, Labohm (2003) feels the precautionary principle is responsible for the set-backs concerning the application of GMOs in the food production of developing countries, technology which could produce safer and cheaper food and help alleviate world hunger. Such major decisions and the repercussions of those choices have real effects on the environment and quality of life, especially in
developing countries. As a result, some believe that the health of people in poorer nations is being compromised and risked to protect wealthier nations from a perceived risk.

In contrast to the critics, some stakeholders, including citizens and advocacy groups, liken the principle to an “extra measure of care”, one that can lead to more complete and rigorous decision-making (Government of Canada, 2001b). O'Riordan and Jordan (1995) describe the precautionary principle as "the voice of conscience and care set against the strident demands for progress and prosperity" (p.209). In instances of government application, the precautionary principle can be perceived as a government's sound commitment to the importance of balancing scientific evidence with important social values including public health and resource conservation. Proponents of the principle feel that by implementing it, industry will actually be forced to be more creative and produce more environmentally-friendly products. Supporters maintain that in nations where it has already been used, such as Germany and Sweden, industries are still able to make sound business decisions (EEA, 2001). O'Riordan and Cameron (1994) suggest that developed nations, whose wealth has come at the expense of developing countries, should have a moral responsibility to adhere to a sustainable and precautionary philosophy for a better future. Advocates also point out that in actual fact the precautionary principle reduces not only regulatory costs, but also achieves a cleaner environment at less cost for society, and that hence the precautionary principle should be invoked more often. Indeed, the costs of preventative actions are usually tangible, clearly allocated and often short-term, whereas the costs of neglect are less tangible, less clearly designated and usually long-term (EEA, 2001).
2.8 Current Philosophical Issues in the Precautionary Principle Debate

2.8.1 Uncertainty in Decision-Making

One of the most fundamental issues facing the precautionary principle is the fact that uncertainty is prevalent in many of the environmental and human health problems encountered today (Fennell & Ebert, in press). Indeed, uncertainty was an important motivating factor behind the development of the precautionary principle, as continued technological progression brought with it increased fear and concern over its impacts. Kaiser (1997) states that with the appreciation of the complexity and uncertainty inherent in natural and man-made systems comes the appreciation of precaution. Simply put, the complete ramifications of current actions are not always known or understood.

Technological innovation is so rapid that cumulative effects of human action may take years to become evident and further years to learn how to mitigate these effects, if at all possible. The precautionary principle posits that once environmental damage is threatened, action should be taken to control, abate, or negate practices which lead to harm, even though scientific uncertainty may still exist as to the specific effects of these activities (CEP, 1993). The precautionary principle can bring to the forefront uncertain issues or implications resulting from human action and technological innovation, making them more explicit. deFur and Kaszuba (2002) point out that the precautionary principle can address uncertainty in various aspects of the situation, including: causal factors or sources of threat; effects of nature or the threat of harm; the cause and effect relationships; and long-term or secondary consequences of the decision.

Uncertainty can be viewed from two distinct perspectives. The first version accepts that environmental discharges cause degradation which science cannot
necessarily confirm, especially in a short period of time. The second version posits that scientific knowledge is indeterminate as regards to mankind's effects on the environment. This more radical perspective questions the level of harm accrued to discharges, as well as our acceptance of the risk stemming from the process. Jackson and Taylor (1992) emphasise that decisions involving policy are inherently laden with some level of uncertainty, yet decisions still have to be made. In this context, it should be understood that uncertainty and questions will always remain, even when policy makers are presented with the most advanced scientific information. Similarly, Costanza and Cornwell (1992) contend that scientists and policy makers should accept uncertainty as being inherent in environmental decision-making, and that a greater focus should be put on linking ecology with economics, as part of sustainable development. Although essentially guided by data from analytical and predictive science, the precautionary principle does recognize and compensate for inherent uncertainty in natural systems, and provides a central paradigm for responsible, timely, definitive preventative action (Santillo et al., 1998).

Myers (1993) questions the level of caution (legitimate scientific caution) exerted in regards to the level of uncertainty about the effects that some technologies have on species or ecosystems. When faced with uncertainty, it is more sensible to be roughly right than precisely wrong, especially when assessing bio-diversity (Myers, 1993). Myers goes on to explain that 50% of species could be lost by the end of this century, and even this estimate is conservative. This possibility illustrates the tact required when examining species loss (irreversible loss) and the uncertainty inherent in such estimates (Fennell & Ebert, in press).
The European Commission's (2000) Communication on the precautionary principle asserts that decision-makers must be aware of the degree of uncertainty attached to the evaluation of available scientific data. Therefore, judging what is an "acceptable" level of risk for society is essentially a political decision, and policy makers thus have a duty to find answers. Haas (1997) investigated the interactions among science, politics, and economic forces in applications of the precautionary principle, observing that management and policy groups do not deal well with situations which involve uncertainty and incomplete or changing data. Haas concluded that the precautionary principle is most relevant in these contexts and could effectively guide managers and policy makers. Costanza and Cornwell (1992) note that policy makers often avoid the uncertainty viewpoint as demonstrated in their laws and regulations, which are developed as absolute and unequivocal, and thus defensible. Since governments are increasingly forced to make decisions which are beyond scientific certainty, uncertainty should be construed as a key aspect of environmental decision-making (Costanza & Cornwell, 1992). Similarly, Gollier et al. (2000) assert that more uncertainty in regards to an anthropocentric influence demands more conservative measures today.

Costanza and Cornwell (1992) contend that current environmental management is plagued by scientific uncertainty, which is then compounded by ineffective methods of incorporating this uncertainty into environmental policy and decision-making. Costanza and Cornwell (1992) differentiate between risk, which is an event with a known probability, and true uncertainty, which can be understood as an event with an unknown probability. When dealing with the irreversible loss of unique species or ecosystem degradation, uncertainty seems to be an unacceptable position. Dovers and Handmer
(1995) propose that the precautionary principle holds significance because it allows us to fly the flag of ignorance and uncertainty, and thus hold the policy fort, until a later time when a more complete framework can be established. Bodansky (1994) states that the precautionary principle addresses two problems raised by the common existence of scientific uncertainty in environmental decisions. First, what knowledge and evidence must exist before instituting measures to protect the environment, and with what degree of certainty? For instance, is there justification in banning or limiting the use of a substance for fear of its potentially harmful effects, even if none have been confirmed? Second, uncertainty raises the management question: how should we respond to and manage uncertain risks? In this context, the precautionary principle addresses the issue of determining appropriate regulatory approaches according to the level of environmental uncertainty.

2.8.2 Risk

The precautionary principle applies to situations which involve potential risks that are not quantifiable - situations where it is not certain that human activities will damage the environment, or when it is unclear as to what causes existing damage (Douma, 2000). Bodansky (1994) observes that risk is a function of the magnitude and the probability of harm. Risk, then, involves estimating the probability (and uncertainty) that events will occur, which at times can include a high degree of confidence about the probability and about the complete risk posed by an activity (Wilson & Crouch, 1987). However, with toxic substances it is more difficult to assess harm, and the time frame for risk to take effect is quite long, often taking years or decades - as well the effects are more difficult to trace (Fennell & Ebert, in press).
Environmental risk can be defined as a statistically circumscribed uncertainty related to an adverse outcome emanating from the environment (Thiele, 2000). Not only does uncertainty make it difficult to identify and assess environmental risks, it also complicates the task of applying the correct management response (Bodansky, 1994).

The precautionary principle states that when faced with uncertainty and potential risks, management strategies should not rely on predicting environmental damage, but rather on reducing damage by abating the full impact of human activities on the environment. However, Morris (2001) argues that applying the precautionary principle would be counterproductive, subjecting us to more risk because it prevents technological progress. Morris (2001) perceives the principle as preventing the discovery and application of newer, safer technologies, and instead limits our ability to manage the risks and uncertainty currently encountered.

Kaiser (1997) points out that the precautionary principle appeals to our sense of controlling risks, and in line with sustainable development, entrusts the present generation to consider and control for the consequences of current action on future generations. The precautionary principle, as used by policy makers, is particularly relevant to the management of risk. Foster et al. (2000) state that viewing the precautionary principle as part of a process for making decisions about risk management in the face of uncertainty would reduce criticism from its most ardent critics or supporters calling for more extreme interpretations of the principle. However, the precautionary principle differs from traditional risk management in three different ways: the higher degree of uncertainty; the parameters for establishing an adequate scientific basis; and the distinctive aspects of sound and rigorous judgement (determining what is sufficiently
sound or credible scientific basis) (Government of Canada, 2001b). The precautionary principle requires that risk avoidance becomes a fixed decision norm when reasonable uncertainty regarding environmental or social impacts arises due to a suggested course of action. Similarly, Jensen (2002) notes that the precautionary principle applies to cases where there is uncertainty about the risk, and the fact that a certain risk of harm creates general fear is often applied as a reason for reacting more restrictively than required. Thus, strong precautionary measures may be applied in situations where uncertainty about the possible harm is prominent and fear is prevalent.

Power and McCarty (1997) assert that society has been compelled to use science to understand human-induced influences upon the environment and that tools of risk assessment have been developed in conjunction to measure these impacts. Although risk assessments are often used, consensus on a plan or framework that identifies the roles of policy and science in decision-making has not been reached - as well as who should bear responsibility for a decision based on an inaccurate risk assessment (Power & McCarty, 1997). Santillo et al. (1998) suggest that the precautionary principle should not be articulated under a risk assessment mechanism, nor should risk assessment be seen as a means of implementing the precautionary principle. The EEA (2001) also reports that conventional risk assessment is too narrow in scope to be adequate for application under conditions of uncertainty.

2.8.3 The Role of Science

The precautionary principle is unique in that it alters the traditional role of scientific evidence. The precautionary principle makes explicit that conclusive scientific
evidence is not required for preventative or remedial action to be taken, rather preventative measures can be taken if scientific evidence makes it plausible that detrimental environmental effects may occur. Thus, the principle mandates that once environmental damage or human health is threatened, measures should be taken to control, abate, or avoid negative effects even though there may still be scientific uncertainty as to the definitive outcomes of the activities (CEP, 1993). Essentially, the principle assumes that science does not always produce data or establish cause in a timely manner to protect human health or the environment, and that undesirable effects may result if measures are implemented only when science does provide such information (CBD, 2001). As a result, precautionary action may be undertaken even though negative outcomes may turn out to be unsubstantiated over time.

The precautionary principle's relationship to science has been widely debated, with two extreme positions evolving. At one end, the precautionary principle is perceived to be a philosophical matter of choice, devoid of scientific involvement. At the other end of the spectrum, the principle is seen to inherently rely on scientific rationale and definitive proof. VanderZwaag (1994) posits that in reality, the precautionary principle lies somewhere in between as it both recognizes and requires scientific support, while at the same time acknowledging the limitations of science and the need to make philosophical decisions in the face of uncertainty. Thiele (2000) concurs that every human act affects the earth in some manner, and good ecological judgement grounded in science as well as moral inquiry is a requisite.

Proponents of the precautionary principle argue that science will only reduce uncertainty, never fully eliminating it, thus requiring tools and planning mechanisms for
controlling human impacts where science alone is insufficient. Santillo et al. (1998) assert that the precautionary principle can help alleviate environmental hazards, and thus should act as a mechanism to address limitations and uncertainties of current scientific knowledge. O'Riordan and Cameron (1994) point out that natural processes often operate in ways that cannot be fully understood and rationalized by current scientific methods. Under this mindset, the principle should not be perceived as an alternative to science but rather as an encompassing principle to steer policy making when scientific certainty does not exist (O'Riordan & Cameron, 1994). Carr (2002) also suggests that the precautionary principle should be viewed as a complement to science, implemented when a lack of scientific evidence results in uncertain outcomes. According to the European Commission's Communication (2000), the precautionary principle "is neither a politicisation of science or the acceptance of zero-risk but that it provides a basis for action when science is unable to give a clear answer" (p. 94). The Communication provides a structured framework for action when faced with scientific uncertainty, and indicates that the precautionary principle is not a justification for omitting scientific evidence.

Further, deFur and Kaszuba (2002) state that the precautionary principle will be of great use in health and environmental issues which alter dramatically as a result of new knowledge. deFur and Kaszuba (2002) cite the work of Colborn and Clement (1992), who recognize that scientists know that some chemicals act at low doses over long periods, and the result of such exposures often alters developmental processes and functions in humans and wildlife over time. While scientific predictions based on laboratory experiments are often quite precise, scientific forecasts, especially long-term
predictions, of the behaviour of natural systems often turn out to be inaccurate or even wrong (Kaiser, 1997). In this regard, Haas (1997) examined the interplay among science, politics, and economic groups in several cases involving the precautionary principle, focussing particularly on how policy is determined and management directed in situations weighing heavily on science. Haas (1997) discovered that when confronted with situations involving uncertainty and incompleteness, policy and management was misguided. Haas (1997) suggests that it be in this context which the precautionary principle holds relevance and acts as an appropriate guide for decision-makers.

Since the precautionary principle negates the requirement to establish causality, it has been widely criticized as being overly unscientific (Bewers, 1995; Gray, 1990). Bonner (2001) plainly states "a strange new doctrine fundamentally at odds with science is making inroads in the most scientifically advanced countries in the world. Advocates call it 'the precautionary principle"' (p.16). Santillo et al. (1998) contend that overt resistance to the precautionary principle by scientists has led to greater efforts to fortify the role of science in decision-making (e.g. Gray, Calamari, Duce, Portman, Wells, & Windom, 1991), even involving attempts to re-define the principle (e.g. Gray & Bewers, 1996). Gray (1990) suggests that the precautionary principle's application to environmental protection is unscientific, thereby diminishing the role of science in policy making. Gray and Bewers (1996) also question the acceptance of perception or unsubstantiated suspicion of effects rather than scientific evidence as sufficient justification for the implementation of precautionary principle measures. The precautionary principle can be invoked to prevent the introduction of substances to the environment by arguing that at some future date, it may be shown to have some negative
effect and thus its usage should be restricted. Gray and Bewers (1996) maintain that the
definition of the precautionary principle needs to be more firmly based in science rather
than on unsubstantiated perceptions that certain actions may lead to negative effects.

Gray and Bewers (1996) believe that the precautionary principle should have a
scientific basis linking harm to action before the concept is invoked. From this
standpoint, science can provide more pessimistic predictions that rationalise uncertainties
questions the precautionary principle's relation to science and to scientific research,
inquiring as to the degree of influence that science has on the principle's implementation.
Kaiser (1997) states that further clarification is required in addressing whether the
principle circumvents science and research altogether, or whether it includes the practice
of science when implementing new rules of environmental management. Such critics of
the precautionary principle argue that it is no more than a convenient catchphrase for
environmentalists, using it to justify calls for restrictions on the use of certain
technologies and thus stifling technological progress (Morris, 2001). Citing the
Greenpeace philosophy of banning substances unless there is proof that a product will not
cause environmental harm, Morris (2001) contends that all substances emit harm, even if
it is slight. Morris argues that this requires the proof of a negative, which is a
philosophical negative, thereby relegating the precautionary principle as an excuse for
arbitrary restrictions on technologies.

VanderZwaag (1994) suggests that the precautionary principle will produce three
consequences for scientific research. First, a greater emphasis will be placed on scientific
research to be more proactive and develop clean production technologies. Second, the
costs of scientific research will be accrued to the polluting industries which now shoulder the burden of proof, instead of the regulator. Last, scientific research will continue to progress from a reductionist focus toward a more interdisciplinary approach with increased monitoring of environmental health. In this regard, the precautionary principle is perceived as a mechanism for cleaning up or developing safer technologies and investigating practical alternatives to complex research procedures, rather than merely assessing risks of different pollutants (CEP, 1993). The precautionary principle may also be able to transfer the burden of proof in cases of scientific uncertainty, passing environmental and financial responsibility to the polluters, who must show that their activities will not damage the environment. O'Riordan and Cameron (1994) observe that due to increasing environmental hazards and a demand for cleaner, safer technologies, more nations, especially wealthy ones, are becoming more risk averse and shifting the burden of proof onto those who cause the calamities.

2.8.4 Cost-Benefit Analysis

Inherent in the discussion on the precautionary principle is the debate on whether cost-benefit analysis should be included in decisions that potentially restrict or ban products that are suspected of causing health or environmental hazards. Cost-benefit analysis seeks to determine whether a proposed investment will generate profit and at what point in terms of scale of costs the additional gains that accumulate equal the additional expenditure (O'Riordan & Jordan, 1995). VanderZwaag (1994) states that one of the most ambiguous aspects of the precautionary principle is whether cost-benefit analysis is considered within the scope of the principle and the impacts the principle
would have on the weighting process. That is, should greater weight be given to the
potential cost side, or should a greater dependence be placed on rationality and scientific
uncertainty? Issaverdis (2001) notes that cost-benefit analysis is a requirement for
achieving best practice, and that a long-term approach is needed to consider all the
environmental and time costs. However, O'Riordan and Jordan (1995) point out that the
precautionary principle is problematic in the benefit realm, as it is difficult to compute or
estimate ecological damage, especially that which may occur tens or hundreds of years
from now. As well, Manson (2002) points out that the central idea of the precautionary
principle, that scientific evidence linking cause to harm is not required before
precautionary measures are invoked, runs counter to standard decision-making
procedures (e.g. cost-benefit analysis), in which potential but unproven causal
connections do not count.

Proponents of the precautionary principle advocate that the concept should be
applied where both the probability and value of irreversible damage are uncertain.
However, Rogers et al. (1997) argue that without such data, a full cost-benefit analysis is
impeded, also stating that cost-benefit analysis is fraught with uncertainty, since market
prices and money values often do not reflect true social values. Rogers et al. (1997) argue
that instead, the principle can be applied through the defensive-expenditure approach.
This approach examines how much the community would be willing to pay to fund
alternatives to maintain the environment's existing state. The defensive-expenditure
approach is then coupled "with risk simulation and the use of stochastic dominance
techniques" to provide a sound framework for determining appropriate levels of
precautionary action (Rogers et al., 1997, p. 359).
2.9 Global Representation of the Precautionary Principle

2.9.1 Europe

Originating in Germany during the 1970s, the precautionary principle initially spread to the rest of Europe, where it has gained a strong foothold and has had more influence on environmental policy than in any other geographical region. Raffensperger (2002) notes that for thirty years, the principle has been used in Europe where it is part of the ethos, a philosophy and way of living and acting in the world. Foster et al. (2000) note that by the Treaty on the European Union (1992), the precautionary principle serves as the basis for European environmental law. With the signing of the Maastricht Treaty of the European Union in 1992, the precautionary principle has been given more priority than ever before, recently being incorporated into various aspects of European policy (Labohm, 2002). The Maastricht Treaty (1992) indicates the position of many European nations when it states: "Community policy on the environment...shall be based on the precautionary principle and on the principles that preventive actions should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay" (Ref: 31 ILM 247, 285-86, SEHN, 2003).

In April 1999, the European Council of Ministers adopted a formal resolution calling upon the European Commission to use the precautionary principle as a guide in its legislative proposals. This led to the European Commission’s Communication on the Precautionary Principle, which outlines the Commission's approach to using the principle and establishes guidelines for applying it. The Communication on the Precautionary Principle was intended to ward off arbitrary use of the principle (Foster et al., 2000), and
emphasises that a wide range of actions may be taken under the principle, including no
action at all. The European Commission also considers the precautionary principle to
have a far wider scope than just the environmental field, as it also encompasses the
protection of human, animal, and plant health. However, Foster et al. (2000) observe that
clear guidelines are still lacking for the weight of evidence required to invoke the
principle, and for determining which of the wide range of precautionary measures that
can be applied in certain circumstances. Nonetheless, the European Union has applied the
precautionary principle numerous times, most notably its ban on American beef treated
with hormones and the global elimination of the pesticide DDT, decisions which have led
to tremendous debate and disagreement.

The spread of the precautionary principle in Europe was reflected in international
environmental agreements including the Rio Declaration, agreed to at the 1992 United
Nations Earth Summit, which verified the principle’s popularity had increased beyond
European shores (Adler, 2002). The principle now forms the basis of environmental law
and policy in several European nations (e.g. United Kingdom, Denmark, Sweden)
documents that a growing number of German and Swedish environmental laws are based
on the principle, and these nations have since developed new, cleaner technologies that
they can now export.

2.9.2 United States

Despite its discussion among academics and policy makers in the United States,
the precautionary principle has yet to gain the strength and support it has received in
Europe. The United States government finds fault in the European Commission's Communication, in that the document neglects to provide a definition of the principle and outline how it is to be applied in the European Union's system (USFDA/USDA, 2000). The U.S. government believes that without clarity of definitions and practical applications, the Commission's proposed precautionary principle could continue to raise concerns, particularly about its potential for use in foreign trade matters. As well, the precautionary principle idea has not prevailed over risk analysis, the method that American society uses to assess new technologies by calculating the mathematical likelihood that new products or processes will harm the public (Raffensperger, 2002). While some U.S. policies could be characterized as precautionary in nature, the precautionary principle has not become an official part of U.S. environmental policy and although various levels of government have endorsed it (e.g. the President's Council on Sustainable Development [PCSD]), few, if any U.S. laws cite the precautionary principle (Foster et al., 2000; Raffensperger, 2002).

There has been reluctance by the United States to adopt the precautionary principle when addressing international environmental and public health concerns that may have a detrimental impact on national economic welfare (O'Neil-Coleman, 2002). The precautionary principle has been debated and opposed primarily in U.S. international trade circles because trade representatives fear that countries could use the principle to prevent trade in commodities, such as genetically modified organisms (Raffensperger, 2002). American business and corporate interests have vehemently argued against the precautionary principle, mainly on the basis of cost (O'Neil-Coleman, 2002). Similarly,
strong opposition to the principle has developed in the past several years among U.S. industry and government agencies supporting commerce.

Myers (2002) notes that although the precautionary principle is an emerging principle of international law, it has only recently been proposed in the United States as a new ground for environmental policy. Nonetheless, the general principle of precaution does underpin much of the environmental legislation in the United States. Perhaps the most notable American example of the precautionary principle's application is by the International Joint Commission (1992). This U.S/Canada organization oversees protection of the Great Lakes and endorsed the precautionary principle as the basis for future environmental policy in calling for the termination of industrial chlorine use (Adler, 2002).

Slowly, the precautionary principle has begun to make some gradual inroads into American policy and planning as it continues to gain global acceptance. Myers (2002) states that the turning point in the development of the precautionary principle in the United States was the Wingspread Conference in 1998. Bonner (2001) notes that at this conference, delegates examined a varied collection of health and environmental problems as proof that scientific evidence is dispensable. The Wingspread Conference, comprised of numerous activists, scientists, and policy makers from five nations, produced the Wingspread Statement that included this explanation of the precautionary principle:

When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically...In this context the proponent of the activity, rather than the public, should bear the burden of proof. The process of applying the Precautionary Principle must be open, informed, and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action. (as cited in Myers, 2002, p. 211).
Myers (2002) reports that after this conference the precautionary principle began to gain greater acceptance, as demand for information about the principle and how to use it has grown exponentially in the last four years. Perhaps most importantly, a framework for precautionary decision-making was proposed at the Wingspread Conference, which established pollution prevention and clean production as primary in all corporate decisions (see Tickner & Raffensperger, 1998). Raffensperger (2002) describes this plan as a robust intellectual framework for implementing the precautionary principle into day-to-day environmental decisions. This framework is discussed in greater detail in Section 2.9.

However, it also imperative to note the changed political environment in the United States since the Wingspread Conference (1998). At the time of the Wingspread Conference, Clinton-era initiatives typically held the environment in high regard, whereas since the Bush administration has been in power, many of the pro-environment people have been released and replaced by pro-industry administrators. This administration has a more economic, rather than ecological focus as evidenced in their policies. Undoubtedly, this political change will influence the future of the precautionary principle in the United States.

2.9.3 Canada

Canada has a long-standing history of implementing the precautionary approach in science-based programs of health, safety and natural resources protection (Government of Canada, 2001a). Although the Canadian government does not consider the precautionary principle to be a rule of customary international law, in a recent decision of the Supreme Court of Canada on pesticide use, it was noted that there might currently be
sufficient state practice to allow a good argument for the principle's induction into international law (Government of Canada, 2001b). One recent example of Canada's implementation of the precautionary principle occurred in 2000 and again in 2001, when the federal government asked Canadians who had lived in the United Kingdom or in France for more than six months during the late 1980s not to donate blood. The precautionary principle was invoked because of the risk of transmitting the human form of "mad cow disease", and though scientific evidence supported this fear, there remains debate on the matter (Government of Canada, 2001a).

Overall, VanderZwaag (1999) deems Canada's initiatives to implement the principle into law as "hesitant hugs", wary of the principle's unclear practical applications. Gradually, Canada has begun to support the principle at the domestic level, as evidenced by its inclusion (although not explicitly articulated) into Canada's 1990 Green Plan, which recognized the need for cautious approaches to environmental protection (VanderZwaag, 1994). As well, discussions on the merit of precaution have occurred in regards to oceans policy. Canada's Oceans Act requires the Minister of Fisheries and Oceans to develop a national oceans management strategy to be based on the principles of sustainable development, integrated management and the precautionary approach (VanderZwaag, 1999). Likewise, the Canadian Environmental Protection Act (1999) makes reference to the precautionary principle and deems it as an administrative duty (VanderZwaag, 1999).

In the fall of 2001, the Government of Canada released a Discussion Document on the interpretation and implementation of the precautionary principle in order to clarify and formalise Canada's position on the principle (SEHN, 2003). The document outlines
that Canada's approach to applying the principle is based on exhibiting flexibility and being responsive to the needs of particular circumstances; and that action on the principle is ultimately guided by judgement, based on values and priorities (Government of Canada (2001a). The Canadian government has also produced a discussion paper that proposes 11 guiding principles that are applicable to all situations and dictate the manner in which the government should act when faced with scientific uncertainty and threats of serious harm (see Government of Canada, 2001a for the list of guiding principles). In all, the proposed principles constitute the primary elements of a federal framework aimed at improving predictability and credibility of Canadian federal precautionary approaches to ensure they are rigorous, sound, and cost-effective (Government of Canada, 2001a).

2.9.4 Australia

The Australian Centre for Environmental Law [ACEL] (2003) reports that over the past decade, Australia, perhaps more than any other nation, has been poised to embrace implementation of the precautionary principle. To date, the precautionary principle has been broadly accepted in policy directives and legislation at all levels of government in Australia, and also has been specifically acknowledged as policy guidance for Australian oceans planning and management (Kriwoken, Rose, & Bache, 2001). Kriwoken et al. (2001) provide these examples of federal legislative acts that specifically articulate the need for the precautionary principle: Fisheries Management Act (1991); National Environment Protection Council Act (1994); Environment, Sport And Territories Legislation Amendment Act (1995); Great Barrier Reef Marine Park Act (1997); Hazardous Waste Regulations (1999); and the Environment Protection and Biodiversity Conservation Act (1999). As part of a commitment to the Australian concept
of Ecologically Sustainable Development (ESD), all levels of governments have agreed
to follow the precautionary principle. For instance, the Environment Protection and
Biodiversity Conservation Act 1999 makes the precautionary principle one of five
principles of ecologically sustainable development (see O'Brien, 1993).

At a Special Premiers' Conference held in Brisbane in 1990, the governments of
Australia (Commonwealth, states, territories and local government) all agreed to develop
an Intergovernmental Agreement on the Environment (IGAE). Concluded in February
1992, Section 3 of the IGAE sets out a number of principles which the parties agree will
inform their decision-making in the environmental context, including polluter pays,
intergenerational equity and the precautionary principle (see Spry, [1997] for full
articulation of precautionary principle). The agreement states that where threats of serious
or irreversible environmental damage exist, a lack of full scientific certainty should not
be used as a reason for postponing measures to prevent environmental degradation. The
legislation also notes that in the application of the precautionary principle, public and
private decisions should be guided by: (i) careful evaluation to avoid, wherever
practicable, serious or irreversible damage to the environment; and (ii) an assessment of
risk-weighted consequences of various options (Kriwoken et al., 2001). However,
O'Brien (2000) argues that Australian governance of the precautionary principle is not
accountable, as the current understanding does not require precautionary measures to be
cost effective or accountable before they are implemented (O'Brien, 2000). Like most
other countries, considerable divergence of opinion about the precautionary principle
exists in Australia, yet it continues to have the potential to become a central feature of
Australian environmental law and policy (ACEL, 2003).
2.9.5 New Zealand

As party to the multilateral environmental agreement, the Rio Declaration on Environment and Development (1992), New Zealand is responsible for adhering to the 27 principles articulated in the Declaration. As part of the Declaration, the precautionary approach is not legally binding but parties must agree to respect it when considering a particular environmental issue. Since the reform process leading to the introduction of the Resource Management Act (1991), New Zealand's environmental legislation has contained a number of common themes, chief among these being the principle of sustainability. The Resource Management Act differs from the approach of previous legislation by concentrating on the environmental effects of human activities, rather than on the activities themselves (Ministry for the Environment [MFE], Government of New Zealand, 1997).

The precautionary principle is inherent in the effects-based focus of the Resource Management Act, and is particularly evident in national environmental laws governing the management of hazardous substances and new organisms. For instance, Section 7 of the Hazardous Substances and New Organisms Act (1996) describes the precautionary approach as involving “the need for caution in managing adverse effects where there is scientific and technical uncertainty about those effects” (Report of the Royal Commission on Genetic Modification [RRCGM], 2003, p.76). The Parliamentary Commissioner on the Environment (2001) asserts the need to recognise the limits of science, the importance of applying the precautionary principle, and the relevance of ethical concerns to policy formulation and decision-making. With respect to biotechnology and genetic
modification especially, New Zealand recognises the need for precaution in decision-making.

In July 1995, the government of New Zealand adopted the precautionary approach as one of the guiding principles in the Environment 2010 Strategy for integration of environment, society, and the economy. The joint standard on Risk Management published by Standards New Zealand and Standards Australia (AS/NZS 4360) also note that adoption of the principle or a precautionary approach is one way of addressing the inherent uncertainty and ignorance associated with environmental decisions (RRCGM, 2003). Overall, the incorporation of the precautionary principle and other related principles into New Zealand's environmental laws allows the nation to play a significant role in developing agreements to further domestic and international environmental goals (MFE, 2003).

2.10 Applicability of the Precautionary Principle in Tourism

Of particular relevance to tourism planning development is the belief that the precautionary principle is here to stay (VanderZwaag, 1999). The range of discussion on the principle's relevancy and application as well as its inclusion into a number of international treaties and conventions, serves as evidence of its potential in addressing uncertainties (Fennell & Ebert, in press). deFur and Kaszuba (2002) state that there are two types of cases in which the precautionary principle will be most useful: those cases with crucial uncertainties, and cases in which new information drastically alters familiar situations. As a global industry, tourism has significant environmental, social, cultural, and economic implications which are often not realised until many years after initial
development. As well, the effects of tourism may entail uncertainty in linking cause and effect, with science unable to give verified proof that harm will or will not result. Since tourism is often reliant on pristine natural environments, those involved in the industry must understand tourism's potential positive and negative effects, while taking responsibility for the maintenance, conservation and protection of natural areas.

Defur and Kaszuba (2002) consider the precautionary principle to be an invaluable tool when policy makers are forced to make decisions with little or no experience or history to draw from. Clearly, tourism development, especially that which occurs in new tourist regions unaccustomed to development, holds many uncertainties and unknown impacts. Much tourism occurs in locations that are particularly sensitive to change, often physically unique areas that are extremely vulnerable to increased human impact and environmental change (May, 1991). Although some residents and physical features may be adaptable to change, when tourism occupies vulnerable areas it often brings an infrastructure of accommodations and related services which are fixed and constant (May, 1991). In such situations, there is often little experience or information to draw from when making decisions and implementing policy. Science is unable to give verified proof that the physical structures and sprawling infrastructure characterising tourism development (and often built on fragile environments) will not cause environmental damage now or in the long run. It is especially in these circumstances that the precautionary principle holds relevance and applicability for the tourism industry.

Within this review of the precautionary principle it has become evident that ethics would play an important role in determining whether to adopt (and if so, to what magnitude) the principle for tourism specifically. Understandably, all cultures and
societies are committed to specific ethical values that help guide behaviours and actions. Akin to other global industries and sectors, ethics vary from one region and culture to another. Specific to tourism development, difficulty is encountered when planners attempt to balance competing stakeholder ethics (e.g. ecological focus vs. economic focus) that struggle to take precedence over others. Typically, tourism development is guided by the ethics and interests of the stakeholder group with the greatest power, which most often are government agencies and tourism multinationals.

Our evolving understanding of sustainability emphasises the inseparability of environment, community, and economic dimensions in planning and development (Howie, 2000). Similar to the ideal of sustainability, the precautionary principle represents an ethical stance to tourism development that all stakeholders should embrace in order for it to be implemented and effective (B.A. Smale, personal communication, December 17, 2003). Inherent in the precautionary principle are numerous ethical considerations, which place at the forefront the intrinsic rights of the natural environment, the rights of future generations, and the rights of resident communities and their right to participate in decision making. The precautionary principle represents a real endorsement of certain ethics over others, ethics which typically do not take precedence in an industry where the profit motive runs supreme. Thus, it is imperative to question the likelihood that tourism multinationals, which have a tremendous amount of influence on the direction and nature of tourism development, would consent to a planning principle that places other considerations well above financial gain.

Similarly, some researchers advocate shifting the financial and environmental responsibility to those proposing tourism development. Shifting accountability to
developers has been identified as a major tenet of the precautionary principle. Such a sentiment calls for a new, more appropriate tourism that requires all the sector's major beneficiaries to share the financial responsibility of internalizing its unprofitable side, namely the costs of providing the associated infrastructure and preserving the natural environment (De Kadt, 1990; Krippendorf, 1992). Ioannides (1995) asserts that no longer should domestic elites and transnational corporations acquire a major portion of the sector's profits without bearing some responsibility for the substantial costs incurred by host societies. Instead, the state must bear the onus of convincing all major private-sector players that failure to account for tourism's environmental externalities will prove detrimental to all involved over time, and could very likely invite the early onset of the resort cycle's downturn (Ioannides, 1995).

At present, there exists a scarcity of research on the precautionary principle and its application for the tourism industry. Most texts on tourism planning do not examine precaution, while others succinctly mention the concept of precautionary action in brief (Fennell & Ebert, in press). For instance, Tribe, Font, Griffiths, Vickery, and Yale (2000) refer to the concept as a guiding principle to effective policy development, in addition to conservation of resources, improvement of environmental quality, preventing environmental damage, the polluter pays principle, and incentive-based policies. However, the precautionary principle is becoming more prevalent in the policy documents of various non-governmental organizations in which it is applied to the tourism context. Examples of such documents include:

The Wilderness Society of Australia (1999), in their Tourism and Natural Areas Policy document, makes reference to the precautionary principle. Under Managing Tourism in
Natural Areas, Policy 2 reads:

2. Provision of visitor access to natural areas must not compromise or infringe on the environmental qualities of the area, or the normal and desired routine of local communities. It will be determined largely by the visitor carrying capacity of an area or the 'limits of acceptable change'. Where difficulties are encountered in determining visitor carrying capacity, the precautionary principle should apply.

The World Wildlife Fund (2001) mentions the precautionary principle in their tourism position statement:

- Raise awareness of sustainable development principles and tools
  WWF will promote in particular the precautionary principle; the polluter pays principle; economic instruments; minimum standards; and environmentally sound technologies, especially in sustainable means of travel to reduce fuel consumption and polluting emissions.

The World Wildlife Fund (2001) again makes reference to the precautionary principle in their tourism principles and aims document, as described:

- Action must be taken to reduce and, where possible, eliminate negative impacts on natural resources and processes.

These actions include limiting tourism-related pollution so as not to exceed ecological carrying capacity (i.e. the robustness of habitats and their ability to replenish extracted resources), including waste assimilation processes. Tourism-related pollution and exploitation must therefore be carefully controlled and regulated, and the precautionary approach should be considered a fundamental principle in tourism development.

As well, The Convention on Biological Diversity (United Nations Environmental Programme, 2001) established International Guidelines for Sustainable Tourism, a set of management principles intended to assist various stakeholders at all levels in the sustainable management of all forms and activities of tourism. Of the ten steps for managing sustainable tourism, step seven emphasises the need for precautionary decision-making in tourism:

7. Decision-making should be a transparent and accountable process to approve or refuse a proposal, and it should always apply to the precautionary principle.
The British Columbia Wilderness Tourism Association (2001), in their Draft Code of Practices for BC's Wilderness Tourism Operators, makes reference to the precautionary principle in the last of 22 statements, which reads:

22. Follow the ideal of the precautionary principle: When it doubt - Don't.

Lastly, in one of the few mentions of tourism and the precautionary principle, the Tourism Industry Association of New Zealand [TIANZ], which represents the interests of the tourism industry, feels that precautionary decision-making should be a baseline requirement when assessing and managing environmental risk (TIANZ, 2003). The group argues that under New Zealand domestic law, section 7 of the Hazardous Substances and New Organisms Act (1996) should be analogous to the precautionary principle (see Palmer, 2001). TIANZ (2003) believes that the precautionary principle should be an integral part of legislation governing the release of genetically modified organisms, which in turn ensures that all implications are fully considered and risks modified.

Recognising the strong links between the environment and tourism in New Zealand, TIANZ wants the precautionary principle included in the articulation of the act as it is concerned with maintaining a clean and natural environment, critical for a sustainable tourism industry.

The Wilderness Society of Australia, the World Wildlife Fund, the Convention on Biological Diversity, the British Columbia Wilderness Tourism Association, and the Tourism Industry Association of New Zealand are all examples of environmentally conscious groups which establish the natural environmental as a key element of the tourism industry. Although none of the aforementioned examples fully articulate the
content of the precautionary principle, it may be attributed to the notion that the precautionary principle has not been sufficiently considered at the tourism policy level (Fennell & Ebert, in press). Nonetheless, they serve as evidence of the impetus of the precautionary principle to act as a regulation tool and planning mechanism within the environmental policy domain.

The prospects for integrating the precautionary principle into tourism are presently unknown. In terms of urban planning and development, Counsell (1999) reports that proponents of weak sustainable development perceive the precautionary principle as a threat to urban planning and development, while those who take a strong sustainable development stance view it as a necessary mechanism. In his study of urban planning in five regions of England and Wales, Counsell (1999) found that respondents (various community stakeholders involved in planning) were divided over the use of the precautionary principle, with some commenting on its misapplications, and with others commenting that it has no place in planning. Counsell (1999) concluded that from a planning context, the precautionary principle could be applied as an additional tool for safeguarding those areas deemed as inviolable, thus ensuring that the overall quality of the environment is sustained and protected against environmental damage.

Measuring the success of tourism development is normally based on economic grounds, be it the amount of foreign currency earned, the number of visitors, capital invested, or potential growth and development among other criteria (Elliott, 1997). However, Elliott (1997) notes that tourism also can be evaluated on the long-term economic and environmental sustainability of tourism, rather than strictly short-term tourism numbers and profits. Unfortunately, such criteria are difficult to effectively
evaluate in a succinct time frame, since the sustainability of the industry and the environment being developed will only become evident over time when adequate social and ecological data become available. Costanza and Cornwell (1992) point out that regulators are increasingly confronted with making decisions outside the realm of scientific certainty, especially with the increased prevalence of subtle, non-visible environmental threats. Thus, regulators also face problems when trying to link impacts to actions, since it is difficult to determine with certainty whether specific actions led to damage (Costanza & Cornwell, 1992). Technology simply moves at such a fast pace that regulators and government policy are unable to adequately protect mankind and the environment. Myers (2002) points out that the precautionary principle takes aim at rectifying some of the inefficiencies of current national regulatory systems which "seem incapable of keeping up with the increasing pace and cumulative effects of environmental damage" (p. 214). Thus, the precautionary principle could act as a proactive regulation tool for policy makers to implement at various levels across many health and environmental issues surrounding tourism.

2.11 Conceptual Framework

A conceptual framework is presented in Figure 2.1 which synthesizes and organizes the literature on the precautionary principle examined in this review. The framework acts as a guide for this research investigation, as it outlines key areas of focus and provides direction for the survey instrument. The literature on the precautionary principle has identified some main areas of investigation and contention which are outlined in the conceptual framework. These include: core elements of the precautionary principle, stakeholders to be involved in implementation, forms of implementation for the
principle, a framework for implementation, and barriers to implementation. The conceptual framework shown in Figure 2.1 illustrates the close links between the concepts of sustainable development, sustainable tourism, and the precautionary
principle, which is a potential tool for tourism planning. Positioned at the top of the framework is the parent concept of sustainable development, described as a process and an ethic. Sustainable development conveys the imperative of taking a long-term perspective in decision-making, and implies a need for intervention and planning (Swarbrooke, 1999). It is based on the idea that economic growth should occur in a more ecologically responsible and socially equitable manner. The core elements of sustainable development are inherent in the concept of sustainable tourism, which represents a holistic, comprehensive, and participatory approach to tourism that is environmentally, socially, and culturally compatible and favours a long-term perspective (Peroz-Salom, 2001).

The literature on the precautionary principle has characterised the principle as embodying certain elements common among many descriptions. Emphasising responsibility and sound practice, the precautionary principle has been summarised to include the following core elements: (i) pro-action; (ii) cost effectiveness of action; (iii) providing ecological margins of error; (iv) intrinsic value of non-human entities; (v) duty of care, or onus of proof on those who propose change; (vi) concern for future generations; and (vii) paying for ecological debts through strict/absolute liability regimes (O’Riordan & Jordan, 1995, p.195). These main elements of the principle illustrate the parallelism with sustainable development, as both are proactive, future focused concepts that are concerned with providing safe, viable products and processes.

The literature also has identified numerous stakeholders involved in tourism planning and development. These key actors include the host community (both leaders/representative of the community and local residents), government bodies (federal,
regional, local entities), private industry (destination zone), tour operators, tourists, international NGOs/voluntary sector, and experts/academics. Evidently, many of these stakeholders have different goals, ethics, ideals, and motivations (even amongst each sub-group), ultimately leading to conflict when trying to plan and practice sustainable tourism (Swarbrooke, 1999). However, the literature has identified that in most regions, it is government agencies that are responsible for the planning and regulation of the industry. Governments are the legitimate holders of power in the political system, responsible for making policy decisions and establishing procedural guidelines (Elliott, 1997). Jeffries (2001) observes that the great complexity of tourism products and processes calls for co-ordination and co-operation, which arguably only governments have the authority and resources to organise.

Much of the literature on the precautionary principle affirms that it is best implemented as a guiding principle to effective environmental policy development (Raffensperger, 2002; Tribe et al., 2000). The principle has been accepted as a guiding principle in several treaties and acts by many national governments and international entities, such as the United Nations and the European Union (O'Riordan & Jordan, 1995). However, Ellis (2000) observes that given the recent elevation of the precautionary principle to the level of a binding obligation in several international environmental conventions, the principle may now be considered in three different forms: as an influential paradigm, as an inspirational norm, and as a rule of law. Certain research has also affirmed that the principle can act as a legally binding norm that establishes criteria for environmental policy (Douma, 2000), leading some to believe the principle is
enshrined in international law as a permanent component in environmental and health protection (Foster et al., 2000).

The framework for implementation proposed in this study was originally developed at the Wingspread Conference (1998), which sought to establish pollution prevention and clean production as primary in all corporate decisions (Tickner & Raffensperger, 1998). Described as a method of implementing the precautionary principle into day-to-day environmental decisions, the original framework has been modified to form a set of key steps that should be addressed in precautionary decision-making specific to the tourism industry. Proposed steps for incorporating the precautionary principle for better tourism industry decision making include Fennell and Ebert (in press):

(i) define the general duty to take precautionary action
(ii) set aggressive goals/vision for achieving sustainability
(iii) assume responsibility for demonstrating the safety of products and processes
(iv) create criteria for decision-making under uncertainty
(v) use tools for implementing precautionary, preventative approaches
(vi) use the 'polluter pays' principle (transfer financial responsibility)
(vii) develop a scheme to systematically evaluate alternative activities/technologies
(viii) assume a duty to monitor, understand, investigate, inform and act; and
(ix) employ participative corporate decision-making

Lastly, numerous barriers inhibiting the implementation of the precautionary principle also have been identified in the literature. Much like sustainability, the precautionary principle is neither a well-defined principle nor a firm concept (O'Riordan & Jordan, 1995), and variance among definitions reflects uncertainty in its application (O'Neil-Coleman, 2002). Bodansky (1994) observes that perhaps its greatest problem is the wide variability in interpretations, while Kaiser (1997) also notes the principle remains vague in how it can be implemented in specific action. VanderZwaag (1999) summarises that fully understanding the applicability of the precautionary principle is
impeded by four reasons including: definitional generalities, definitional variations, unresolved philosophical debates and the vast spectrum of measures suggested to operationalize precaution (p.358).

As shown in Figure 2.1, the conceptual framework employed in this study was developed by the literature summarised in this review, and acted as an over-arching guide for the research investigation. The framework assisted in the construction of the survey instrument and was also reviewed based on the outcomes of this study.
CHAPTER 3: METHODS

3.1 Introduction and Review of Objectives

As examined in the previous chapter, the precautionary principle has generated much interest and debate among government officials and academics because it deals specifically with our understanding and management of human-environment interactions. Although the precautionary principle is receiving greater attention in its applicability as a regulation tool for several sectors including environmental protection, food safety, human welfare issues, and international trade, its association with tourism has not been studied.

Due to tourism’s close link with the natural environment and the industry’s rising popularity (especially among nature-based activities), the question arises as to the relevancy of the precautionary principle in its application to managing/regulating tourism activities. This study served as an exploratory investigation, designed to gain an understanding of the status and possible application of the principle in relation to the tourism industry. To re-iterate, the purpose of this investigation was to provide a more precise understanding and basis from which to assess the precautionary principle’s potential role in tourism. More specifically, this study addressed the following research objectives:

a) To assess the entire study sample's understanding and opinion of the precautionary principle in tourism.

b) To evaluate what tourism stakeholder would have the power and skill set to be involved in implementing the precautionary principle into tourism decision-making.
c) To compare tourism academic’s and regional government tourism official’s understanding and opinion of the precautionary principle in tourism.

d) To compare the responses of tourism academics from Canada, United States, United Kingdom, Australia and New Zealand in terms of their understanding and opinion of the precautionary principle in tourism.

e) To compare tourism academics with different departmental affiliations in terms of their understanding and opinion of the precautionary principle in tourism.

The intent of this chapter is to provide a detailed explanation of the study's methods and rationale for this type of data collection. In reviewing the objectives of the study, the researcher decided to employ a self-administered web-based survey as the research design for the study. This method of data collection was chosen because it was suitable for the computer-literate sample frame and most effectively balanced the researcher’s considerations of expense, speed, response rates, question format, and the quality of data returned. A mail-based survey was originally intended as the method of data collection, but was decided against due to high expense, a slower return rate (Heflich & Rice, 1999; Schillewaert, Langerak, & Duhamel, 1998), as well as difficulty in obtaining full mailing addresses. For the purposes of this study, a cross-sectional approach was utilised, as data were collected at only one point in time due to monetary and time restrictions. Cross-sectional designs are used to gather data that reflect current attitudes, opinions, or beliefs (Creswell, 2002). As an introductory study, this research was designed to garner a current understanding of the precautionary principle’s standing among the sample population.
3.2 Study Sample

The survey population for this research project was comprised strictly of tourism academics and regional government tourism officials. Due to the infancy and specificity of the concept, this population was comprised of individuals who could most effectively answer the researcher's survey questions about tourism, sustainability and the precautionary principle. The researcher acknowledges that using non-probability sampling with a convenience focus does introduce bias into the sampling framework, as not all members of a population had been given a chance to be included. However, it was the intent of the study to survey those individuals with the most salient interest in the research topic.

The survey population for this study was comprised (by virtue of their position) of well-educated individuals who were thought to hold a salient interest in the issue being examined. Many researchers have reported that issue salience had more influence on mail survey response rates than other factors such as respondent contact, monetary incentives, or even survey length (Bean & Roszkowski, 1995; Heberlein and Baumgartner, 1978; Martin, 1994; Roberson & Sundstrom, 1990). Neuman (1997) also states that response rates may be high for a target population that is well educated or has a strong interest in the survey topic. Similarly, Fowler (2002) notes that the fit between the survey content and the surveyed population, in addition to the extent to which the sample population are proficient users of the internet, are key to the overall success of a study employing web-based data collection. However, it must be acknowledged that there are varying levels and foci of education among government officials; and there is certainly varying foci of interest among academics. It also was understood that not all participants may be able to
answer the questions, nor will all be interested in the topic. Nonetheless, by virtue of their position in academia and government, it was assumed this was a well-educated sample that was likely to be interested in the topic and capable of completing the survey.

A total of 473 participants comprised the initial contact list of the survey population. The names, institutional affiliations, and email addresses of the tourism academics were compiled from an internet search. A search engine (e.g. Google) was used to locate the tourism academics through their current institutions. This usually involved going directly to and exploring the various academic departments for contacts.

Regional government tourism officials within the five regions also were recruited from an internet search. A database of government tourism offices (Tourism Offices Worldwide Directory; see www.towd.com/) was employed to gather information on government representatives. When possible, the name and email address of an individual responsible for tourism planning and development research in that agency was obtained during this internet search, and this survey was then sent to that specific individual.

Again, participants in this study consisted of two distinct groups, the first of which contained tourism academics from universities and colleges who researched the tourism industry. This group totalled 365 individuals familiar with the tourism industry, as they either had taught subjects on or closely related to tourism, and/or had conducted research on tourism-related subjects. This group of tourism academics was comprised of researchers based in several academic disciplines, including recreation and leisure studies, tourism studies, environmental studies/sciences, geography, land planning management, and other social sciences. These tourism academics were employed at approximately 200 different academic institutions.
The second group of participants in this study consisted of 108 regional/provincial/state level government tourism officials, as an objective of this study was to compare the responses of tourism academics to government tourism officials. This group consisted of government officials only at the regional/provincial/state level, as this level constitutes the senior, policy making element in tourism planning (Gunn, 1993; Jeffries, 2001). The regional/state level of tourism planning is the most specific level, as it identifies regional policies and strategies, types of tourism development permitted, regional tour patterns, and also recommends techniques for implementing tourism plans (Inskeep, 1988).

All participants involved in this study were located within the five geographical regions of: Canada, United States, United Kingdom, Australia, and New Zealand. These five regions were selected for three primary reasons: (i) the majority of tourism academics were based in these regions; (ii) the precautionary principle has received the greatest level of attention and research in these areas; and (iii) there were few, if any, language barriers to overcome between the researcher and participants.

3.3 Web Surveys

3.3.1 Advantages of Web Surveys

Web-based surveys are becoming an increasingly promising method of data collection, making for a less expensive and more expedient method of gathering information (Beniger, 1998; Fowler, 2002; Heflich & Rice, 1999; Schillewaert et al., 1998). Numerous benefits of using web-based surveys for data collection have been identified, including a high and fast rate of response, simple transfer of data into a
database for analysis, cost and time savings, convenience for the respondent, and the possibility of wider geographic coverage (Carbonaro & Bainbridge, 2000; Heflich & Rice, 1999; Mertler, 2002; Schillewaert et al., 1998). Similar to mail surveys, web-based surveys can be completed at the respondent’s chosen pace (Cook, Heath, & Thompson, 2000). However, Sheehan and Hoy (1999) point out that unlike a mail survey which can be easily mislaid, a web-based survey remains in place until deliberately deleted.

This type of data collection also is quite effortless and straightforward for the participant. The individual does not have to open any envelopes or mail back any forms; he or she simply has to click on the selected answers and submit the information at the end. A University of Colorado study found that 55% of the respondents reported ease of use as one of the things they liked most about participating in a web survey (University of Colorado at Boulder, 1996). At the same time, the web-based, self-administered questionnaire offers anonymity for the respondent, as he/she is not required to provide a name or meet the researcher, nor does the researcher track his/her responses. Another major benefit of using a web-based survey is that it allows the researcher to gather information from participants located in a wide geographical area, which was important to this investigation since individuals from Canada, United States, United Kingdom, Australia, and New Zealand comprised the sample population. Mail costs would have run quite high while response speed would be very slow.

Employing a web-based methodology also is relevant due to the expert sample population in this study. Although internet technology is not universally accessible, Dillman (2000) claims that some populations, such as those in the university environment, may have sufficient technological sophistication for equal sampling to
occur. Dillman (2000) explains: “Certain populations, such as university professors, federal government employees, workers in many companies and corporation, and members of professional organizations, generally have internet address and access. For these populations, email and web surveys may have only minor coverage problems” (p.356). Fowler (2002) also observes that the response rate for web-based surveys depends critically on the population and the survey’s purpose, in addition to the extent to which the sampled population are facile users of the Internet. For this study, each participant selected had an email address and was expected to have internet access and be relatively adept at using the internet. Couper (2000) points out that when the populations of interest are current users of the internet, coverage is not a key concern; rather, non-response is the greatest issue.

In their study comparing mail, fax, and web-based survey methods, Cobanoglu, Warde, and Moreo (2001) used a technologically advanced population which included 300 randomly selected hospitality professors located in the United States. The researchers found that web-based surveys had significant advantages over mail and fax surveys in terms of response rates and costs. The web-based survey had the greatest response rate (44.21%) and was the most cost-efficient method compared with mail and fax methods. Based on the results of their study, Cobanoglu et al. (2001) recommend that web-based surveys could be used when surveying educators for three reasons. First, web methodology yields a higher response rate more rapidly and at less cost than mail methodology. Second, the majority of educators have access to the internet and hold email accounts through their institutions. Third, since the data submitted by the respondents are coded automatically, it saves the researcher time and resources. Due to
the many advantages inherent in using the web-based methodology for this study, the electronic survey was determined to be the most effective in reaching the sample and obtaining the desired information.

3.3.2 Disadvantages of Web Surveys

As with any method of data collection, there also exist disadvantages in using a web-based survey for gathering information. Such disadvantages include the potential non-random nature of the respondent group, the unavailability of population lists or incorrect email addresses, limited computer access to the survey, and assorted technology-related problems (Mertler, 2002). While the non-random nature of web-based survey research can be addressed through maintaining an accurate population list (Mertler, 2002), Taylor (2000) suggests that this type of data collection is not based on probability sampling, but rather on "convenience" sampling. Further difficulties encountered in administering a web-based survey may include a lack of technological familiarity on the part of respondents and an unwillingness to complete an on-line survey (Carbonaro & Bainbridge, 2000; Schillewaert et al., 1998).

Couper (2000) observes that little information is currently available on non-response in web surveys, but suggests several explanations to account for a low response rate during data collection. First, many of the motivating tools used in mail surveys (e.g. personalized signatures, letterhead, incentives) cannot be implemented the same way in web surveys. Second, lower response rates may be accrued to technical difficulties including slow modem speeds, weak connections, or poor web browsers, which in turn may discourage some from completing the survey instrument. A third explanation for poor response rates is due to anonymity concerns related to the internet. Some
organizations may track incoming and outgoing messages, thus discouraging some from completing the survey, especially if it examines a sensitive or controversial subject. The infancy of this type of data collection, coupled with concerns regarding the security of the internet and the anonymity of one’s submission, may lead potential participants to negate their involvement.

3.3.3 Web Survey Response Rates

There currently exists a dearth of research literature comparing the response rates of web surveys to that of mail surveys (Underwood, Kim, & Matier, 2000). There are numerous potential influences on response rates in both postal and web surveys, including survey length, respondent contacts, design issues, research affiliation and compensation (Sheehan, 2001). Past research investigating the use of web-based survey methodology has shown that there is wide variation in response rates and the speed of response for web-based surveys (Sheehan & McMillan, 1999). For instance, Bachmann, Elfrink, and Vazzana (1999) and Parker (1992) reported that response rates were greater for web-based surveys than for traditional mail surveys. However, a number of studies have found that response rates for email and web-based surveys may not equal traditional methods of data collection (Mehta & Sivadas, 1995; Schuldt & Totten, 1994; Sheehan & McMillan, 1999; Weible & Wallace, 1998). As well, Saphore (1999) found no differences in the pattern of responses between a web-based survey and an identical mail survey, and King and Miles (1995) reported equivalent results in the use internet versus paper instruments.
3.4 Instrumentation

The survey instrument used in this study (Appendix A) was developed by the researcher and formatted to a web-based survey by a member of the Brock University Web Development Team. The survey instrument was posted as part of the Brock University website, but was only accessible by invitation since access required a proper username and password. The first page of the survey contained the Brock University template in the top left corner, complete with full contact information for the university. In their meta-analysis of mail questionnaire response rates, Fox, Crask, & Kim (1988) found that university sponsorship increased response rates by 9% (as compared with commercial sponsorship). Centred at the top of the first page was the title of the study, as well as the identification of the researcher’s name, school, faculty and departmental affiliation.

A brief, one paragraph introduction outlining the study’s goal and the composition of each of the questionnaire’s sections was provided on this first page. This description of the study was designed to catch the interest of the participant and encourage them to carry on with the survey. Before the questions began, participants were provided with a one paragraph synopsis of the precautionary principle (Section A: A Brief Overview – The Precautionary Principle). The researcher decided to include this overview because the precautionary principle was a relatively new environmental policy with which some respondents may not be familiar. At the same time, the overview succinctly defined and summarized the major tenets of the precautionary principle, information that was critical knowledge for participants in order to give informed answers. This overview was perceived as a necessary inclusion as it was expected that some of the sample may not be
familiar with the concept.

The overall structure of the survey and its questions follows the Conceptual Framework provided in Figure 2.1. The framework employed in this study was developed by the literature summarized in this review, and acted as an over-arching guide for the research investigation and in the construction of the survey. The survey's question component was divided into three sections including Section B: The Precautionary Principle; Section C: Application of the Precautionary Principle to Tourism; and Section D: Demographic Information (see Appendix A). The questions in Section B: The Precautionary Principle, examined respondents' familiarity with the precautionary principle and his/her perceptions of its main elements. The next component of the questionnaire, Section C: Application of the Precautionary Principle to Tourism, examined respondents' perceptions of how the precautionary principle may be applied to the tourism industry. This section addressed the most likely form of application the principle could hold in tourism; the stakeholders that could be involved in applying the principle; the relevant forms of educating others on the principle; potential barriers inhibiting to the principle’s application in tourism; and a framework for implementing the precautionary principle into tourism decision-making.

The final component, Section D: Demographic Information, required the participant to provide basic demographic information (which in no way could specifically identify the individual). This information was used for comparing the opinions of different groups including academics/non-academics and those from different geographical regions. This section also required the participant to provide information on his or her work position and geographical region of work. At the conclusion of the
survey, participants were encouraged to add general comments regarding the precautionary principle and tourism. Such open-ended questions have the advantage of allowing respondents to articulate their thoughts in their own words, thus allowing the researcher to see how respondents actually feel about the topic (Weisberg, Krosnick, & Bowen, 1996).

This questionnaire was designed in a manner to assist participants in efficiently responding to the questions. The questions that comprised this survey were primarily close-ended and specific. Alreck and Settle (1985) state that with a self-administered questionnaire, the response task is much quicker and easier with close-ended questions because they have three important attributes: focus, brevity, and simplicity. This question format provides the same frame of reference for all respondents to use when answering the questions, making it easy and inexpensive to work with (Weisberg et al., 1996). A Likert-type scale was employed for close-ended questions which required the participant to express their level of agreement or opinion on certain variables. However, the researcher does acknowledge that an individual's beliefs and feelings may be lost when forced into a few fixed categories created by the researcher, as pointed out by Neuman (1997). For close-ended questions employing a Likert-type scale, the researcher used a five-point scale to measure these variables, thus giving the respondent a middle point, titled "No Opinion". Weisberg et al. (1996) feel that it is good practice to include a middle alternative because it often represents the most accurate description of some respondents' feelings. Written labels also were provided for each scale point to help clarify their meanings for respondents.

A scrolling approach was used for this web survey, where the entire survey
appeared as one long HTML page and the respondent simply clicked “submit” at the end of the survey to transmit the data to the server. Dillman (2000) argues for this design approach in web-based surveys, as this format makes the survey instrument appear condensed, and gives the respondent a clear indication of the length of the survey via the scroll bar. Although cash and non-cash incentives have been shown to increase response rates for traditional surveys (Dillman, 2000; Hare, Price, Flynn, & King, 1998; Shank, Darr, & Werner, 1990), tangible incentives were not included for respondents of this research investigation due to the difficulty in affixing them to a web-based survey.

3.5 Pre-test

After constructing repeated versions of the survey instrument and making numerous revisions, a final copy of the questionnaire was prepared for preliminary testing. The questionnaire was pre-tested for readability, format and content by several faculty members in the Department of Recreation and Leisure Studies at Brock University. Pre-testing can be used as a tool in question formulation, and can also aid in determining how long it will take to complete a questionnaire (Weisberg, et al., 1996). The selected faculty members were asked to read through the questionnaire and the accompanying informed consent letter, and were encouraged to make comments on questions, instructions, scales, or any other element of the questionnaire they found confusing or flawed. Several amendments were made to the survey instrument from the feedback gathered during pre-testing. One question was omitted from the final survey due to confusion over its content and selected variables. Several questions were modified in terms of content and structure, most often requiring minor re-wording and spacing.
corrections. As well, the instructions for a few questions were found to be confusing, thus wording was altered to ensure clarity and consistency in response.

3.6 Pilot Study

A pilot survey was conducted during April and May 2003 to ensure that all data collection procedures operated efficiently and to identify any errors or problems in the study’s methodology and survey instrument. Creswell (2002) observes that pilot tests help determine whether the individuals in the sample are capable of completing the survey instrument and whether they can understand the content and questions. The sample for the pilot study consisted of 20 participants (15 tourism academics and five regional government tourism agencies). One tourism academic and one regional government tourism official were represented in each of the five geographical regions. The remaining 10 participants comprising the pilot sample were tourism academics randomly selected from other regions of the world not represented in the study’s sample.

All 20 participants selected for the pilot study were emailed a pre-notification letter that invited them to participate in the study. This email provided information on the research topic and advised them that the survey link would arrive in a subsequent email two days later. Two days after the pre-notification, each individual was emailed the informed consent letter with the survey link. This email contained the username and password required to access the survey. A reminder email was sent out ten days after the initial mail out of the web-based survey, and a letter of appreciation email was sent out three weeks after the initial mail-out. This pilot group was excluded from the final sample of the study. Of the 20 individuals in the pilot study, three academics (0 government
officials) completed the survey. One respondent was from New Zealand, one was from Hong Kong, and the final participant neglected to identify their region of residence. Two participants indicated they were unable to participate because they were not in office during the period of data collection.

As the pilot sample contained too few participants to run statistical analyses, it was understood that the primary goal of carrying out the pilot survey was to identify any technological problems in the study’s methodology, as well to ensure the sample population could respond to the survey’s content. All respondents answered each question in Sections B and C of the questionnaire which specifically examined the precautionary principle. This indicated that those who responded appeared to understand the topic and the questions. However, it was not possible to determine why the remaining pilot sample did not access the survey or answer the questions. There were no technological faults that occurred during the pilot study’s methodology. All responses remained anonymous and were efficiently tabulated in a database. The only alterations that were made were minor coding changes, as some responses appeared as written codes rather than numeric codes. These changes were made for easier statistical analyses for the actual study results. No amendments were made to the survey instrument itself or to any of the email letters.

3.7 Data Collection Procedures

All data analysed in this study was collected during May and June 2003. The study was conducted in a similar fashion as the pilot study, but with minor alterations in the timetable. To begin the data collection process, all 473 individuals were first sent a
pre-notification email (Appendix B) for the purpose of introducing the research project and allowing individuals to pre-determine whether they wanted to participate or be omitted from the study. There is conflicting evidence regarding the influence of pre-notification on survey response rates, but much research has indicated that pre-notification leads to increases in response rates and response speeds for postal mail surveys (Fox, Crask & Kim, 1988; Haggett & Mitchell, 1994; Murphy, Daley & Dalenberg, 1991; Sheehan & McMillan, 1999; Taylor & Lynn, 1998). In their meta-analysis of response rates for web-based surveys, Cook et al. (2000) found that the number of contacts, personalized contacts, and pre-contacts were the factors most associated with higher response rates. The pre-notification email also ensured that correct email addresses had been obtained for the survey population. Any incorrect email addresses of the sample population were returned as undeliverable after the pre-notification email was sent. Of the 473 individuals in the sample population, a total of 63 (58 academics, 5 government agencies) were returned as undeliverable after that first email. The researcher then searched for the correct email addresses and sent out the pre-notification to the remainder of the survey population immediately. The researcher was unable to locate the correct email addresses for 16 of the sample’s 473 participants.

Two days after the pre-notification, each of the tourism academics were then emailed the informed consent letter with the survey link (see Appendix C). Regional government tourism officials also were emailed the informed consent letter at the same time in May 2003 (see Appendix D). Since few government tourism agencies actually post the names and positions of their employees, this letter differed slightly from the copy sent to the tourism academics as it required to be forwarded to an individual responsible
for tourism planning and development within the government agency. Both informed consent letters introduced participants to the purpose and composition of the survey, and assured the respondents of anonymity in the research design and during the dissemination of results. Participants were instructed in these letters that completion of the survey indicated informed consent, and that participation in the study was completely voluntary and they could choose not to participate or could withdraw at any time.

Participants were asked to fill out the survey only once. A link was provided at the end of this email that the participant could simply click on to access the survey instrument. To ensure security, a generic username and password were provided in the email to all participants, codes that were required to access the survey. These two codes were six digit codes determined by the researcher. After sending the pre-notification emails, the researcher decided to conceal the email addresses of the survey population from fellow participants for all subsequent emails. The researcher sent all remaining email notices as blind carbon copies to the entire sample population.

A reminder email (see Appendix E) was sent out to all participants two weeks after the initial mail out of the web-based survey. This email politely reminded participants to complete the survey and instructed that if they had already participated in the survey, to not fill it out again. Again, a link was provided at the end of this email that the participant could simply click on to access the survey instrument. The generic username and password were again provided to all participants. Again, post-notification, (or follow-up contact) has had positive effects on increasing response rates for postal surveys (Comer & Kelly, 1982; Jobber, 1986; Murphy, et al., 1991; Yammarino, Skinner & Childers, 1991). Kittleson (1997) stresses the effectiveness of follow-up reminders for
electronic surveys, stating that such contact may double the response rate. Throughout the data collection process, effort was directed at making the response task easy and carrying out repeated contacts in order to maximize response rates.

A letter of appreciation email (see Appendix F) was sent to all participants three weeks after the first contact. This final email thanked participants for their participation and encouraged them to contact the researcher if they had questions or wanted a summary of the research project. This email also provided a date when the survey would be taken off the internet and encouraged participants to complete the survey before it was eliminated from the website. Approximately four weeks after participants received the email with the link to the web survey, the questionnaire was removed from the website by a member of the Brock University Web Development Team. The survey's database was then sent directly to the principal investigator.

3.8 Validity and Reliability

Efforts have been made to ensure the measurements used in this exploratory investigation conform to validity and reliability criterion. Validity is concerned with measuring or evaluating the appropriate constructs outlined in the purpose and research objectives (Neuman, 1997). The objectives of this study and existing literature on the precautionary principle guided the construction of the survey instrument used to gather data. Several drafts of the questionnaire were developed in order to ensure the survey's questions provided data that could effectively answer the research objectives. Similarly, careful consideration was given to construct validity. Effective questions were linked
with relevant measurement devices in order to most accurately measure the concepts in this study.

Reliability is a measure of accuracy and response consistency (Poynter, 1993). A reliable indicator or measure produces the same result each time a construct is measured. Again, consideration was given to devising questions and measurements that precisely and completely pertained to the research objectives. As this was an exploratory study, much effort was directed at clearly conceptualizing all constructs and linking them with accurate levels of measurement. As well, the questionnaire was pre-tested and pilot tested by tourism academics and government tourism officials before it was used in the final study.

3.9 Anonymity Considerations

To begin, this study was reviewed and approved by the Brock University Research Ethics Board (File# REB 02-300). To ensure the anonymity of all participants taking part in this study, participants were not required to put their names on any part of the survey. Basic demographic information was required from the participant (see Appendix D, Section D), but this information could not identify specific participants. As this was a web-based survey, there was no way for the researcher to link specific responses to specific participants; all data were automatically aggregated into a database. Only the principal investigator had access to this database. The data obtained from this research remained confidential during the research process and in the release of the findings. No names were attached to any of the data sources (i.e. questionnaire) or to any of the information obtained during the study and reported in the written report. In reporting the study, participants were only referred to collectively and in general terms
(e.g. number of males and females, age range of participants). Participants were instructed that names would in no way appear in the written or oral dissemination of the research study. This research project did not infringe upon the rights of the participants. All participants were informed in writing that they had the right to refuse to participate or to terminate their participation in the study. A total of 26 participants (22 academics, 4 government) exercised this right and asked to be removed from the sample group. These individuals were not different in any meaningful way from the rest of the survey population or the final sample. They simply requested to be omitted from the study because either they had no interest in the topic, or felt they could not provide honest or knowledgeable answers.

3.10 Treatment of Data

The data obtained from the surveys were measured using a variety of methods. First, basic descriptive statistics were computed to organize and summarize the data. This included calculating measures of central tendency including the mean, median, and mode (depending on the scale of data) as well as standard deviations. Inferential data analysis included independent sample t-tests to compare the difference between two sample means. This test was used to compare responses of the tourism academics and government tourism officials across several variables. As well, one-way analysis of variance (ANOVA) was used to compare three or more sample means simultaneously. This test was utilised when comparing regional groups and different academic affiliation groups across several variables.
3.11 Limitations and Delimitations

3.11.1 Limitations

There are certain conditions inherent in the study which led to the existence of limitations. First, this is a cross-sectional study which involves the collection of data at only one point in time. This research serves as an introductory investigation that seeks to collect data from respondents from a single questionnaire, distributed once. One potential limitation could have been the timing of the study, as data were collected during May and June of 2003. This time period is often the end of the academic year for universities and colleges, and some respondents were found to be away from office during this time while others were on sabbatical leave.

One limitation of conducting a web-based survey involved enlisting co-operation from the sample population to complete the survey. As this study employed a non-traditional web-based methodology, some individuals may have avoided participation due to anonymity concerns. However, participants were made well aware that the survey instrument was only accessible to the sample population and complete anonymity was guaranteed.

As well, some participants chose not to participate due to a lack of knowledge and a perception they could not offer informed responses. Subsequently, another limitation common to self-administered approaches is that people who are particularly interested in the research problem tend to be most likely to respond (Fowler, 2002; Heberlein & Baumgartner, 1978; Jobber, 1984). Nonetheless, all attempts were made by the researcher to assemble a sample population that could respond to the research topic and offer informed answers. However, results indicated a relatively low level of familiarity with
the precautionary principle among the sample. The researcher acknowledges this limitation and the subsequent repercussions on the validity and reliability of the study due to the low level of familiarity with the research topic.

3.11.2 Delimitations

Certain delimitations were placed on the study in order to make it a feasible project which could still achieve its primary objectives. A first delimitation of this study is that the sample chosen to participate was not a random sample, but an expert sample chosen out of convenience. The researcher collected information only from tourism academic experts and government decision makers perceived to be in a position of knowledge and authority. The researcher recognises this limitation and understands that by choosing this sample of only two stakeholder groups he limited the ability to draw generalisations from the data collected. As well, this study only surveyed government tourism policy makers at the provincial/state/region level. Although there are many other individuals that have a vested interest and stake in the tourism industry, the researcher was interested in attaining a well-educated sample (assumed by virtue of their position) that would be familiar with tourism, the precautionary principle, and its potential application to the industry.

This study was also restricted in terms of the geographical regions selected to survey by the researcher. Tourism researchers and government policy makers from five regions were selected (Canada, United States, United Kingdom, Australia, and New Zealand). These regions were selected for three primary reasons: (i) the majority of English-speaking tourism academics were based in these regions; (ii) the precautionary principle has received the greatest level of attention and research in these areas; and (iii)
there were few, if any, language barriers to overcome between the researcher and participants.
CHAPTER 4: RESULTS

4.1 Introduction

The quantitative data analyses conducted in this study employ both descriptive and inferential statistics to describe the state of the precautionary principle in tourism. The following tables and figures present questionnaire response data and comparisons made between selected groups. Of the 473 individuals comprising the survey population, a total of 16 participants were unable to be contacted due to incorrect email addresses, even after the researcher had made several attempts with updated addresses (15 tourism academics, one government tourism official). A further 26 participants requested to be omitted from the study (22 tourism academics, 4 government tourism officials) after the pre-notification email. Thus, a total of 42 individuals in the original survey population were omitted from the survey. The survey was sent to 431 individuals (328 tourism academics, 103 government tourism officials). During the four-week period in which the survey was available on the internet, a total of 100 participants responded for a response rate of 23.2 %. Overall, the final sample was quite representative of the survey population, as there did not appear to be any response bias based on known characteristics such as region, academic affiliation, or level of government.

4.2 Questionnaire Results

Frequencies were examined for all 100 participants of the study. The socio-demographic characteristics of the sample are illustrated in Table 4.1. In terms of age, most respondents (33.0%) were between the ages of 50-59, while another 31.0% reported they were between the ages of 40-49. Twenty-four percent of respondents were between
Table 4.1

*Socio-Demographic Characteristics of the Study Sample*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>30-39</td>
<td>24</td>
<td>24.0</td>
</tr>
<tr>
<td>40-49</td>
<td>31</td>
<td>31.0</td>
</tr>
<tr>
<td>50-59</td>
<td>33</td>
<td>33.0</td>
</tr>
<tr>
<td>60-69</td>
<td>5</td>
<td>5.0</td>
</tr>
<tr>
<td>70+</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>GENDER&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>66</td>
<td>68.7</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>31.3</td>
</tr>
<tr>
<td>HIGHEST LEVEL OF EDUCATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>High School</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Vocational/Trade School</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>College Diploma</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Undergraduate Degree</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>MA/MSc/MBA or equivalent</td>
<td>18</td>
<td>18.0</td>
</tr>
<tr>
<td>PhD/MD or equivalent</td>
<td>74</td>
<td>74.0</td>
</tr>
<tr>
<td>EMPLOYER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic</td>
<td>80</td>
<td>80.0</td>
</tr>
<tr>
<td>Government</td>
<td>20</td>
<td>20.0</td>
</tr>
<tr>
<td>REGION OF RESIDENCE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>33</td>
<td>33.0</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>30</td>
<td>30.0</td>
</tr>
<tr>
<td>Canada</td>
<td>18</td>
<td>18.0</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>New Zealand</td>
<td>9</td>
<td>9.0</td>
</tr>
</tbody>
</table>

<sup>a</sup> Four participants did not report their gender.
the ages of 30-39. These figures indicate that 88.0% of all respondents were in three age
cohorts.

Of the participants who responded to the question on gender, 68.7% were male
and 31.3% were female. When questioned on their highest level of education attained,
74% of the respondents indicated they had attained a PhD or equivalent, while another
18% reported they had attained a MA/MSc/MBA degree. Given the nature of the study,
the sample was comprised of well-educated participants. Respondents had a mean score
of 14.86 years of experience in their present occupation.

Findings related to geographical region of residence illustrate that 33 respondents
(33.0%) indicated they currently live in the United States, while 30 respondents (30.0%) resided in the United Kingdom. Eighteen respondents were from Canada, ten were from
Australia, and a further nine were from New Zealand. The statistics for the sample
indicated considerably more academic versus government respondents. Of the 100 participants, 80 were found to be academics, while only 20 reported they were
government employees.

4.3 Precautionary Principle

4.3.1 Familiarity and Sources of Information

To garner a better understanding of the sample's familiarity and level of exposure
to the precautionary principle, respondents were asked to rate their awareness of the
principle and were encouraged to check all relevant boxes. In terms of the participant's
familiarity with the precautionary principle, Table 4.2 shows that 46% of respondents
reported they had at least read about the precautionary principle, while 32% had also
discussed it with colleagues. However, 37% of the participants in this study indicated
they were not familiar with the precautionary principle. This variation indicates that almost half of the sample was familiar with precautionary principle, while over a third was not aware of the principle. Only 7% of participants reported having published material on the precautionary principle. In regard to the source(s) of information on the precautionary principle, Table 4.2 shows that 42% of respondents indicated they had read

Table 4.2

Respondents’ Knowledge of the Precautionary Principle

<table>
<thead>
<tr>
<th>Familiarity with the Precautionary Principle</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have read about the precautionary principle</td>
<td>46</td>
<td>46.0</td>
</tr>
<tr>
<td>Am not familiar with the precautionary principle</td>
<td>37</td>
<td>37.0</td>
</tr>
<tr>
<td>Have discussed precautionary principle with colleagues</td>
<td>32</td>
<td>32.0</td>
</tr>
<tr>
<td>Have presented on the precautionary principle</td>
<td>11</td>
<td>11.0</td>
</tr>
<tr>
<td>Have published material on the precautionary principle</td>
<td>7</td>
<td>7.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources of Information on the Precautionary Principle</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Journal</td>
<td>42</td>
<td>42.0</td>
</tr>
<tr>
<td>Discussion with Colleagues</td>
<td>36</td>
<td>36.0</td>
</tr>
<tr>
<td>Conference</td>
<td>21</td>
<td>21.0</td>
</tr>
<tr>
<td>Government Document</td>
<td>16</td>
<td>16.0</td>
</tr>
<tr>
<td>Newspaper/Popular Magazine</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>Television/Internet</td>
<td>10</td>
<td>10.0</td>
</tr>
</tbody>
</table>

a Items ranked according to highest level of response
of the principle in an academic journal. Thirty-six percent reported they had also spoken of the precautionary principle in discussions with colleagues, while 21% had learned about the principle at a conference.

4.3.2 Main Elements of the Precautionary Principle

In keeping with the objectives of the study, respondents were asked to rate the importance of several fundamental elements of the precautionary principle. Specifically, individuals were asked to rate the importance of each core element of the principle as it applied to the tourism industry. It should be reiterated that at the beginning of the survey, participants were provided with a one-paragraph synopsis of the precautionary principle, which succinctly defined and summarized the major tenets of the precautionary principle. Table 4.3 shows that of the seven key elements, respondents indicated that "concern for future generations" was of the greatest importance (M=4.45, SD=0.83), closely followed by "mankind's ethical responsibility to safeguard nature" (M=4.36, SD=0.82). Table 4.4 also indicates that shifting accountability to developers was perceived as least important, as evidenced by low mean scores for "passing financial responsibility to developers" (M=3.86, SD=1.10) and "passing environmental responsibility to developers" (M=3.83, SD=1.17).

In examining the responses of tourism academics and government tourism officials, Table 4.3 indicates that mean scores were variable across all seven elements. Overall, the high mean scores generally indicate that the participants viewed every element of the precautionary principle as important. In terms of the highest mean scores of each group, tourism academics rated the tenet "concern for future generations"
Table 4.3

*Importance of Each Element of the Precautionary Principle as Applied to the Tourism Industry*

<table>
<thead>
<tr>
<th>Core Element</th>
<th>Academics n=80</th>
<th>Government n=20</th>
<th>Total n=100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
</tr>
<tr>
<td>Concern for future generations</td>
<td>4.53 0.78</td>
<td>4.15 0.99</td>
<td>4.45 0.83</td>
</tr>
<tr>
<td>Mankind's ethical responsibility to safeguard nature</td>
<td>4.38 0.80</td>
<td>4.30 0.92</td>
<td>4.36 0.82</td>
</tr>
<tr>
<td>Preventative action reduces long-term costs</td>
<td>4.34 0.95</td>
<td>3.95 1.00</td>
<td>4.26 0.82</td>
</tr>
<tr>
<td>Paying for ecological liability</td>
<td>4.08 0.88</td>
<td>3.80 0.68</td>
<td>4.02 0.85</td>
</tr>
<tr>
<td>Willingness to take action prior to formal scientific proof</td>
<td>3.96 1.02</td>
<td>3.60 0.68</td>
<td>3.89 0.97</td>
</tr>
<tr>
<td>Passing financial responsibility to developers</td>
<td>3.83 1.16</td>
<td>4.00 0.86</td>
<td>3.86 1.10</td>
</tr>
<tr>
<td>Passing environmental responsibility to developers</td>
<td>3.79 1.24</td>
<td>4.00 0.86</td>
<td>3.83 1.17</td>
</tr>
</tbody>
</table>

*Elements ranked according to highest level of importance

Note: Importance was based on a 5-point scale (1 = extremely unimportant, 5 = extremely important).

(M=4.53, SD=0.78) the highest, while government tourism officials rated "mankind's ethical responsibilities to safeguard nature" (M=4.30, SD=0.92) as having the highest mean score. Tourism academics also rated the final two elements previously mentioned of shifting accountability to developers as the least important elements, while government tourism officials rated "willingness to take action prior to formal scientific proof" (M=3.60, SD=0.68) and "paying for ecological liability" (M=3.80, SD=0.70) as having the lowest mean scores.
4.3.3 Stakeholders and the Precautionary Principle

Since the tourism industry encompasses many stakeholders who are involved in its development and management, participants were asked to identify which stakeholders had the power to be involved in implementing the precautionary principle. Most respondents indicated a belief that on the whole, government was the stakeholder which had the power to become most involved. The top three selections of respondents were all government entities. More specifically, Table 4.4 shows that 85.0% of respondents indicated that the "local government" had the power to be involved, closely followed by 84.0% of participants who indicated that the "state/provincial government" also had the power to aid implementation. Seventy-two percent of respondents reported that "private

Table 4.4

Tourism Stakeholders who have the Power to be Involved in Implementing the Precautionary Principle

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local/city government</td>
<td>85</td>
<td>85.0</td>
</tr>
<tr>
<td>State/provincial government</td>
<td>84</td>
<td>84.0</td>
</tr>
<tr>
<td>National government</td>
<td>79</td>
<td>79.0</td>
</tr>
<tr>
<td>Private industry (destination zone)</td>
<td>72</td>
<td>72.0</td>
</tr>
<tr>
<td>Host community</td>
<td>71</td>
<td>71.0</td>
</tr>
<tr>
<td>Tour operators</td>
<td>67</td>
<td>67.0</td>
</tr>
<tr>
<td>International NGO/Voluntary sector</td>
<td>50</td>
<td>50.0</td>
</tr>
<tr>
<td>Tourists</td>
<td>45</td>
<td>45.0</td>
</tr>
</tbody>
</table>

a Items ranked according to highest level of response
industry within the destination zone had the power to be involved in the principle’s implementation.

4.3.4 Educating Stakeholders

Since the precautionary principle is a relatively new environmental planning principle and this study is examining its applicability to tourism, it was deemed worthwhile to query participants on the most relevant manner of educating stakeholders on the principle. Table 4.5 shows respondents indicated that "workshops/seminars" (M=4.27, SD=0.89) was by far the most relevant method of educating stakeholders on implementing the precautionary principle into tourism decision-making. Interestingly, both "government policy manuals" (M=3.59, SD=1.22) and "academic literature"

Table 4.5

<table>
<thead>
<tr>
<th>Mode of Education</th>
<th>Academics n=80</th>
<th>Government n=20</th>
<th>Total n=100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Workshops/seminars</td>
<td>4.34</td>
<td>0.87</td>
<td>4.00</td>
</tr>
<tr>
<td>Films or instructional videos</td>
<td>4.01</td>
<td>0.93</td>
<td>3.00</td>
</tr>
<tr>
<td>Educational pamphlets or brochures</td>
<td>3.89</td>
<td>1.02</td>
<td>3.35</td>
</tr>
<tr>
<td>NGO publications</td>
<td>3.74</td>
<td>1.11</td>
<td>3.35</td>
</tr>
<tr>
<td>Government policy manuals</td>
<td>3.74</td>
<td>1.17</td>
<td>3.00</td>
</tr>
<tr>
<td>Academic literature</td>
<td>3.60</td>
<td>1.10</td>
<td>3.25</td>
</tr>
</tbody>
</table>

* Items ranked according to highest level of relevancy

Note: Relevancy was based on a 5-point scale (1 = extremely irrelevant, 5 = extremely relevant).
were perceived as the least relevant methods of educating stakeholders. Table 4.5 also indicates that tourism academics rated the relevancy of all modes of education as having higher mean scores of relevancy than did government tourism officials. Tourism academics rated "workshops/seminars" (M=4.34, SD=0.87) as the most relevant method of education, while for the same group "academic literature" (M=3.60, SD=1.10) had the lowest mean score. In comparison, government tourism officials also rated "workshops/seminars" (M=4.00, SD=0.92) as having the highest relevancy scores, while "films or instructional video" (M=3.00, SD=1.21) and "government policy manuals" (M=3.00, SD=1.30) had the lowest relevancy scores.

4.3.5 Forms of Implementation

The literature examining the precautionary principle indicates many different potential forms of implementation, depending on the specific industry, its scale and scope. Respondents were asked to rate several forms of implementation for the principle for the tourism industry, checking all forms they perceived to be viable. Table 4.6 shows that 79.0% of respondents indicated that the precautionary principle could be implemented as a "guiding principle" for the tourism industry. This form of implementation was well ahead of any other form, as 49.0% of respondents indicated it could be an "inspirational standard to attain" and 46.0% felt it could be an "influential paradigm/method".
Table 4.6

Most Viable Forms of Implementation of the Precautionary Principle for the Tourism Industry

<table>
<thead>
<tr>
<th>Form of Implementationa</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guiding principle</td>
<td>79</td>
<td>79.0</td>
</tr>
<tr>
<td>Inspirational standard to attain</td>
<td>49</td>
<td>49.0</td>
</tr>
<tr>
<td>Influential paradigm/method</td>
<td>46</td>
<td>46.0</td>
</tr>
<tr>
<td>National rule of law</td>
<td>20</td>
<td>20.0</td>
</tr>
<tr>
<td>International binding obligation</td>
<td>19</td>
<td>19.0</td>
</tr>
</tbody>
</table>

a Items ranked according to highest level of response

4.4 Adapted Framework for Implementation

In order to surmise the potential applicability of the precautionary principle within tourism decision-making, an adapted framework for incorporating the precautionary principle into tourism planning was proposed to participants. Individuals were asked to read through the steps and rate the relevancy of each step, as applied specifically to the tourism industry. Of the nine steps in the framework, Table 4.7 shows respondents indicated that the most relevant step was to "involve stakeholders in decision-making" (M=4.65, SD=0.67). The next most relevant step was reported to be "assuming a duty to monitor and assess actions" (M=4.36, SD=0.76), followed closely by the "need to develop a system to evaluate alternative activities/technologies" (M=4.24, SD=0.70). The lowest mean scores were reported for the steps "set aggressive goals for achieving
Table 4.7

Relevancy of Framework Steps for Incorporating the Precautionary Principle into Tourism Decision Making

<table>
<thead>
<tr>
<th>Framework Step</th>
<th>Academics M SD</th>
<th>Government M SD</th>
<th>Total M SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involves stakeholders in decision-making</td>
<td>4.71 0.48</td>
<td>4.40 1.14</td>
<td>4.65 0.67</td>
</tr>
<tr>
<td>Assume a duty to monitor and assess actions</td>
<td>4.43 0.76</td>
<td>4.10 0.72</td>
<td>4.36 0.76</td>
</tr>
<tr>
<td>Develop a system to evaluate alternative activities/technologies, etc.</td>
<td>4.33 0.61</td>
<td>3.90 0.91</td>
<td>4.24 0.70</td>
</tr>
<tr>
<td>Outline industry-wide standards on when to take precautionary action</td>
<td>4.16 0.79</td>
<td>3.75 0.85</td>
<td>4.08 0.82</td>
</tr>
<tr>
<td>Transfer financial responsibility to polluters</td>
<td>4.04 1.15</td>
<td>4.10 1.02</td>
<td>4.05 1.12</td>
</tr>
<tr>
<td>Create criteria for decision-making under uncertainty</td>
<td>4.06 0.84</td>
<td>3.95 0.83</td>
<td>4.04 0.83</td>
</tr>
<tr>
<td>Use tools for implementing precautionary preventative measures</td>
<td>3.97 0.66</td>
<td>3.80 0.83</td>
<td>3.94 0.70</td>
</tr>
<tr>
<td>Set aggressive goals for achieving sustainability</td>
<td>3.97 0.95</td>
<td>3.20 0.83</td>
<td>3.82 0.97</td>
</tr>
<tr>
<td>Assume responsibility for demonstrating safety in products/processes</td>
<td>3.96 0.74</td>
<td>3.20 0.89</td>
<td>3.81 0.83</td>
</tr>
</tbody>
</table>

*Steps ranked according to highest level of relevancy

Note: Relevancy was based on a 5-point scale (1 = extremely irrelevant, 5 = extremely relevant).

One participant did not answer this question.

In comparing the responses of tourism academics and government tourism
officials, Table 4.7 indicates that tourism academics rated eight of the nine steps as having higher mean relevancy scores than did government tourism officials. Government officials had a higher mean score for "transfer financial responsibility to polluters" (M=4.10, SD=1.02) than did tourism academics (M=4.40, SD=1.05). The average mean score for tourism academics was 4.18, while the average mean score for government officials was only 3.82. Each group reported the step to "involve stakeholders in decision-making" as having the highest mean score of all nine steps, followed by "assume a duty to monitor and assess actions". Table 4.7 shows that the tourism academics had rated each step in the same sequence as the total samples' rating, most likely due to the larger sample size of the academics. The government tourism officials had some minor variation in the remaining seven steps of the framework when comparing its sequence to the total sample. In terms of the least relevant steps, tourism academics reported the step to "assume responsibility for demonstrating safety in products/processes" (M=3.96, SD=0.74) as having the lowest mean score. Government officials rated the steps to "assume responsibility for demonstrating safety in products/processes" (M=3.20, SD=0.89) and "set aggressive goals for achieving sustainability" (M=3.20, SD=0.83) as having the lowest mean scores.

4.5 Barriers to Practical Implementation

A review of the literature indicated that numerous barriers currently inhibit the implementation of the precautionary principle and as part of this study, individuals were asked to rate the importance of these barriers. Table 4.8 indicates respondents felt that "varying interpretations of the principle" was the most important barrier (M= 4.27, SD=0.79) inhibiting the implementation of the precautionary principle into tourism.
Table 4.8

*Importance of Barriers Inhibiting the Implementation of the Precautionary Principle into Tourism*

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Academics n=80</th>
<th>Government n=20</th>
<th>Total n=100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varying interpretations of the principle (i.e. different values)</td>
<td>4.22 0.80</td>
<td>4.45 0.76</td>
<td>4.27 0.79</td>
</tr>
<tr>
<td>Vagueness of implementing principle into specific action</td>
<td>3.98 1.03</td>
<td>4.50 0.61</td>
<td>4.08 0.98</td>
</tr>
<tr>
<td>Lack of consensual definition on what the principle means</td>
<td>4.04 1.10</td>
<td>3.95 1.32</td>
<td>4.02 1.14</td>
</tr>
<tr>
<td>Determining the appropriate entity to implement</td>
<td>4.03 0.91</td>
<td>4.00 1.12</td>
<td>4.02 0.95</td>
</tr>
<tr>
<td>Vast spectrum of control measures that could be implemented</td>
<td>3.71 1.25</td>
<td>4.00 0.86</td>
<td>3.77 1.19</td>
</tr>
<tr>
<td>Principle negates the requirement to establish causal links</td>
<td>3.28 1.34</td>
<td>3.40 0.99</td>
<td>3.30 1.28</td>
</tr>
</tbody>
</table>

*Barriers ranked according to highest level of importance
Note: Importance was based on a 5-point scale (1 = extremely unimportant, 5 = extremely important).*

Participants identified the second most important barrier as the "vagueness of implementing the principle into specific action" (M=4.08, SD=0.98), while the least important barrier was "principle negates the requirement to establish causal links" (M=3.30, SD=1.28).

When comparing the responses of tourism academics and government tourism officials, Table 4.8 indicates that government officials rated all barriers as having higher mean scores of importance as compared to tourism academics, except for "lack of
consensual definition on what the principle means". Specifically, government tourism officials reported the highest mean scores for the barriers "vagueness of implementing principle into specific action" (M=4.50, SD=0.61) and "varying interpretations of the principle" (M=4.45, SD=0.76). Table 4.8 shows tourism academics had the highest mean scores for the barriers "varying interpretations of the principle" (M=4.22, SD=0.80) and "lack of consensual definition on what the principle means" (M=4.04, SD=1.10). Both groups rated the barrier "principle negates the requirement to establish causal links" as having the lowest mean score of importance.

4.6 Comparison of Tourism Academics and Government Tourism Officials

In keeping with one of the main objectives of the study, the researcher used further statistical analyses to compare the responses of tourism academics and government tourism officials in terms of their understanding and opinion on the viability of the precautionary principle in tourism decision-making. However, as stated previously, a point of concern was the low response numbers of government tourism officials (n=20), compared to 80 tourism academics. Johnson (1984) advocates having a minimum sample size of 30 in each group when comparing the means of two independent samples for inference procedures. Despite this warning, it was decided to conduct independent samples t-tests to compare the two groups on a few variables, as t-tests can determine whether there is a statistically significant difference between two independent samples on the dependent variable. For this test, the dependent variable is measured at the interval or ratio level and the independent variable is measured at the nominal or ordinal level.
First, no statistically significant difference was found when comparing tourism academics and government tourism officials on their perceived importance of each of the main elements of the precautionary principle. However, some significant findings were discovered when comparing the two groups in their perception of possible methods of educating stakeholders on using the precautionary principle for tourism. Means were derived from a five-point scale, with five denoting extreme relevance. Tourism academics' rating of the relevancy of using government policy manuals (M=3.74) was significantly higher than government tourism officials' rating [(M=3.00), t(98) = 2.47, p<.05]. Tourism academics' rating of the relevancy of using films or instructional videos (M=4.01) was again significantly higher than that of government tourism officials [(M=3.00), t(24.91)=3.48, p<.05]. Lastly, tourism academics also rated the relevancy of using educational pamphlets or brochures (M=3.89) as significantly higher than government officials [(M=3.35), t(98)= 2.10, p<.05].

Independent samples t-tests also were performed to compare the two groups in their perception of the adapted framework proposed for incorporating the precautionary principle into tourism decision-making. Of the nine proposed steps, four were found to be statistically significant. Means were calculated based on the response to a five-point scale, with five denoting extreme relevance. First, tourism academics rated the relevancy to "develop a system to evaluate alternative activities/technologies, etc." (M=4.33) significantly higher than government tourism officials [(M=3.90), t(97)=2.51 , p<.05]. Second, tourism academics rated the step to "outline industry-wide standards on when to take precautionary action" (M=4.16) significantly higher than government tourism officials [(M=3.75), t(97)=2.06, p<.05]. Third, tourism academics also rated the
relevancy of "set aggressive goals for achieving sustainability" (M=3.97) significantly higher than government tourism officials' rating of the step [(M=3.20), t(97)=3.34, p<.05]. Last, tourism academics rated the relevancy to "assume responsibility for demonstrating safety in products/processes" (M=3.96) as significantly higher than government tourism officials [(M=3.20), t(97)=3.93, p<.05].

4.7 Comparison of All Responses by Geographical Region

As noted earlier, the review of the literature indicated a great deal of variation in the acceptance and implementation of the precautionary principle. One objective of this study, then, was to compare the responses of all participants from different regions of the world in terms of their understanding and opinion on the precautionary principle in tourism decision-making. A one-way analysis of variance (ANOVA) test was performed comparing the regions of United States, United Kingdom, Canada, and Australia/New Zealand. Due to low response numbers, Australia (n=10) and New Zealand (n=9) were amalgamated into one group. It should be acknowledged that the Australia/New Zealand group (n=19) and the Canadian group (n=18) still had low numbers for statistical purposes. However, these four groups were used to examine whether any regional variation existed in how the groups view the precautionary principle. The ANOVA procedure compares three or more sample means simultaneously when each mean is obtained from a different group of individuals. The purpose of the ANOVA is to determine whether the means of the dependent variable for each level of an independent variable are significantly different from each other (Grimm & Yarnold, 1995). To use ANOVA, there must be a continuous dependent variable and one or more categorical independent variables.
The ANOVA procedure was used to compare the four groups on their understanding of the elements of the precautionary principle, methods of educating stakeholders, their perception of barriers inhibiting the implementation of the principle, and their view of the adapted framework proposed for incorporating the principle into tourism industry decision-making. No statistically significant differences were discovered between any of the groups across all variables. Independent samples t-tests were also performed to compare just North American tourism academics and United Kingdom tourism academics on the same variables. Again, no statistically significant differences were discovered when comparing the two groups across any of the variables. Lastly, independent samples t-tests were employed to compare the responses of tourism academics from the United States and tourism academics from the United Kingdom on the same variables. No statistically significant differences were found when comparing the two groups across those variables.

Table 4.9 provides the results concerning the importance of the precautionary principle's main elements, as perceived by all participants from the United States, United Kingdom, Canada, and Australia/New Zealand. Measures of central tendency statistics are provided based on the response to a five-point scale (five denoting extreme importance). Overall, the statistics indicate similar responses for the four groups in their perceived importance of the precautionary principle's main elements. Specifically, all four groups were quite similar in their sequential list of importance of each step by mean score. However, Table 4.9 shows that the Australia/New Zealand group reported the highest mean scores of importance for all elements of the precautionary principle in its application to tourism. This group had higher mean scores for most elements of the
Table 4.9

Regional Perception of the Precautionary Principle's Main Elements

<table>
<thead>
<tr>
<th>Core Element</th>
<th>United States</th>
<th></th>
<th>UK</th>
<th></th>
<th>Aust/NZ</th>
<th></th>
<th>Canada</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=33</td>
<td>M  SD</td>
<td>n=30</td>
<td>M  SD</td>
<td>n=19</td>
<td>M  SD</td>
<td>n=18</td>
<td>M  SD</td>
<td>n=100</td>
</tr>
<tr>
<td>Concern for future generations</td>
<td>4.48 0.71</td>
<td>4.37 0.93</td>
<td>4.68 0.48</td>
<td>4.28 1.13</td>
<td>4.45 0.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mankind's ethical responsibilities to safeguard nature</td>
<td>4.36 0.86</td>
<td>4.20 0.85</td>
<td>4.68 0.48</td>
<td>4.28 0.96</td>
<td>4.36 0.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventative actions reduces long-term costs</td>
<td>4.15 1.06</td>
<td>4.30 0.99</td>
<td>4.53 0.51</td>
<td>4.11 1.13</td>
<td>4.26 0.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paying for ecological liability</td>
<td>4.09 0.84</td>
<td>4.00 0.79</td>
<td>4.37 0.50</td>
<td>3.56 1.10</td>
<td>4.02 0.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willingness to take action prior to formal scientific proof</td>
<td>3.82 1.04</td>
<td>4.03 0.67</td>
<td>4.00 0.94</td>
<td>3.67 1.28</td>
<td>3.89 0.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passing financial responsibility on to developers</td>
<td>4.12 1.14</td>
<td>3.83 1.05</td>
<td>3.79 0.98</td>
<td>3.50 1.20</td>
<td>3.86 1.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passing environmental responsibility on to developers</td>
<td>4.00 1.04</td>
<td>4.03 0.67</td>
<td>4.00 1.05</td>
<td>3.39 1.13</td>
<td>3.81 1.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Elements ranked according to highest level of importance

Note: Importance was based on a 5-point scale (1 = extremely unimportant, 5 = extremely important).

The precautionary principle over the total sample's mean scores. On the contrary, the Canadian group tended to have the lowest mean scores for all elements of the precautionary principle. In comparison, Table 4.9 shows the United States and United Kingdom groups appeared to fit in between the high mean scores of the Australia/New Zealand group and the lower mean scores of the Canadian group on most of the seven elements of the precautionary principle that were tested.

All four regional groups rated the step "concern for future generations" as having the highest mean scores of importance (M=4.45, SD=0.83). Although no statistical
significance was discovered, the largest difference in mean scores between the three groups was for the element "paying for ecological liability". For this variable, the Australia/New Zealand group had the highest mean score (M=4.37, SD=0.50), while the Canadian group had a much lower score (M=3.56, SD=1.10). In terms of the element with the lowest mean score, "willingness to take action prior to formal scientific proof" was the lowest for the United States group (M=3.82, SD=1.04), "passing financial responsibility to developers" was lowest for the United Kingdom (M=3.83, 1.05) and Australia/New Zealand groups (M=3.79, SD=0.98). Lastly, the main element "passing environmental responsibility to developers" was rated lowest for the Canadian group (M=3.39, SD=1.13).

Table 4.10 provides the results concerning the relevancy of the adapted framework proposed for incorporating the precautionary principle into tourism decision-making, as perceived by all participants from the United States, United Kingdom, Canada, and Australia/New Zealand. Mean and standard deviation scores were provided based on the response to a five-point scale (five denoting extreme relevancy). Overall, the statistics indicate the four regional groups were relatively similar in their perception of the relevancy of each of the nine framework steps. As mentioned earlier, no statistically significant differences were found when comparing the four regions using a one-way analysis of variance (ANOVA) test. All four groups each rated the step to "involve stakeholders in decision-making" as having the highest mean score of relevancy. However, the United States group reported the step to "assume a duty to monitor and assess actions" (M=4.30, SD=0.73) as having the next highest mean score, as did the United Kingdom group (M=4.47, SD=0.67) and the Australia/New Zealand group.
Table 4.10

Regional Perception of the Adapted Framework for Implementing the Precautionary Principle

<table>
<thead>
<tr>
<th>Framework Stepa</th>
<th>United States</th>
<th>UK</th>
<th>Aust/NZ</th>
<th>Canada</th>
<th>Totalb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Involve stakeholders in decision-making</td>
<td>4.73</td>
<td>0.52</td>
<td>4.53</td>
<td>0.86</td>
<td>4.83</td>
</tr>
<tr>
<td>Assume a duty to monitor and assess actions</td>
<td>4.30</td>
<td>0.73</td>
<td>4.47</td>
<td>0.63</td>
<td>4.39</td>
</tr>
<tr>
<td>Develop a system to evaluate alternative activities/technologies, etc.</td>
<td>4.27</td>
<td>0.67</td>
<td>4.07</td>
<td>0.83</td>
<td>4.39</td>
</tr>
<tr>
<td>Outline industry standards on when to take precautionary action</td>
<td>4.18</td>
<td>0.88</td>
<td>4.03</td>
<td>0.85</td>
<td>4.22</td>
</tr>
<tr>
<td>Transfer financial responsibility to polluters</td>
<td>4.21</td>
<td>0.78</td>
<td>3.97</td>
<td>1.27</td>
<td>3.94</td>
</tr>
<tr>
<td>Create criteria for decision-making under uncertainty</td>
<td>4.09</td>
<td>0.88</td>
<td>3.90</td>
<td>0.92</td>
<td>4.11</td>
</tr>
<tr>
<td>Use tools for implementing precautionary preventative measures</td>
<td>3.88</td>
<td>0.78</td>
<td>3.90</td>
<td>0.76</td>
<td>4.00</td>
</tr>
<tr>
<td>Set aggressive goals for achieving sustainability</td>
<td>3.82</td>
<td>1.01</td>
<td>3.87</td>
<td>1.04</td>
<td>3.78</td>
</tr>
<tr>
<td>Assume responsibility for demonstrating safety in products/processes</td>
<td>3.79</td>
<td>0.86</td>
<td>3.77</td>
<td>0.77</td>
<td>3.83</td>
</tr>
</tbody>
</table>

aSteps ranked according to highest level of relevancy

Note: Importance was based on a 5-point scale (1 = extremely irrelevant, 5 = extremely relevant).
bOne participant did not answer this question.

(M=4.39, SD=0.61). In comparison, the Canadian group indicated the step to "develop a system to evaluate alternative activities/technologies etc." (M=4.33, SD=1.03) had the second-highest mean score, while the Australia/New Zealand also had that step tied with
its second-highest mean score (M=4.39, SD=0.98). Table 4.10 indicates some further
variation in mean scores of the framework steps that constitute the middle ranked mean
scores.

As opposed to the more distinct variation of mean scores found in the opinion of
the precautionary principle's main elements, Table 4.10 reveals that the Australia/New
Zealand group did not report higher mean scores for most variables, while the Canadian
group did not report overly low mean scores. In terms of the framework step with the
lowest mean score, "assume responsibility in demonstrating safety in products/processes"
was lowest for both the United States (M=3.79 SD=0.86) and United Kingdom groups
(M=3.77, SD=0.77). In comparison, "set aggressive goals for achieving sustainability"
was reported as having the lowest mean score for both the Australia/New Zealand group
(M=3.78, SD=0.81) and the Canadian group (M=3.78, SD=1.00).

4.8 Comparison of Tourism Academic Responses by Departmental Affiliation

A final objective of the study was to compare the responses of tourism academics
with different departmental affiliations in their understanding and opinion of the
precautionary principle and tourism. Since tourism is a multi-disciplinary field of study,
individuals were instructed to check all pertinent academic disciplines listed (see
Appendix A, Section D, Question 7). The Tourism/Hospitality discipline was the largest
group (n=40), followed by Recreation/Leisure (n=19), Environmental Studies/Sciences
(n=14), Geography (n=11), Business/Commerce/Marketing (n=10), Other Social
Sciences (n=9), and Planning/Land Management (n=8). However, a point of concern
regarding this response was the small size of department affiliations except the
Tourism/Hospitality group. This limitation meant that comparing the groups to draw statistically significant relationships would violate rules of statistical analyses. To rectify this problem, the researcher re-coded the original eight categories into three groups and assigned each participant to one of the groups. The researcher subjectively consolidated similar disciplines together to comprise three distinct groups. The new categories included the following division of the 80 academic respondents: 42 (52.5%) participants were placed in a recreation/tourism group, 22 (27.5%) were based in geography/land planning/environmental sciences, and the remaining 16 (20.0%) were from a business/commerce or from another department not specified by the respondent.

One-way analysis of variance (ANOVA) tests were performed comparing the re-coded academic departments. Again, no statistically significant differences were discovered when comparing the three groups on their understanding of the elements of the precautionary principle, methods of educating stakeholders, barriers inhibiting the implementation of the principle, and the adapted framework proposed for incorporating the principle into tourism decision-making.

4.9 Comparison of Respondents by Familiarity with the Precautionary Principle

Overall, much of this study's sample (37%) reported they were less familiar with the precautionary principle than the researcher had anticipated. The researcher acknowledges the impacts this has on interpreting the results of the study, as a good portion of the sample was unfamiliar with the principle and answered the survey's questions based on the provided description preceding the questions. This disparity in familiarity may also be reflected in the variation of opinion among the respondents, as
most of the standard deviations on the indicators were quite high (i.e. above 1.0). This suggests a lack of consensus among respondents, perhaps attributed to their overall lack of knowledge and familiarity.

Given the number of respondents that indicated they were not familiar with the precautionary principle, it was deemed prudent to compare those who were familiar with the principle (46%) with those who were not (37%). These two groups were compared on their understanding of the elements of the precautionary principle, methods of educating stakeholders, barriers inhibiting the implementation of the principle, and the adapted framework proposed for incorporating the principle into tourism decision-making. No statistically significant differences were found when comparing the two groups. However, the group that was familiar with the precautionary principle reported higher mean scores for most methods of educating stakeholders, placed less importance on barriers inhibiting implementation of the principle, and reported higher mean scores of relevancy for most of the steps of the framework.

4.10 Open-ended Comments

Although this study used quantitative data analyses to garner results on the precautionary principle in tourism, respondents also were given the opportunity to provide subjective input at several stages of the questionnaire. The researcher acknowledges that an individual's beliefs and feelings may be lost when forced into a few fixed categories created by the researcher, as pointed out by Neuman (1997). Thus, open-ended boxes (labelled "other") were provided at the end of most questions in order to gather more subjective information. As this was an exploratory investigation with the possibility of being replicated in the near future, there were potential improvements to be
made and variables to be added in further investigations. Subjective opinions could also clarify or aid in the interpretation of quantitative data derived from the study.

Hereafter are presented the most prevalent subjective comments provided by participants. To begin, when questioned on the sources of information on the precautionary principle, four respondents further indicated they had also read of the principle in "academic books". Most respondents (42.0%) had indicated they learned of the precautionary principle in "academic journals". When examining which key actors have the skill set or level of expertise to implement the precautionary principle in tourism decision-making, five respondents wrote that "local communities" also had the ability to be part of the process. These participants chose to make clear the differentiation between "local community" and "local government official", which was listed as an option to be selected. Lastly, when rating the methods of educating stakeholders on the precautionary principle, five participants wrote that "case studies/demonstration projects" would be effective, while another five indicated the "internet" would be a valid source of education on the principle. For this particular question, respondents indicated that "workshops/seminars" (M=4.27, SD= 0.89) was by far the most relevant method of educating stakeholders on implementing the precautionary principle into tourism decision-making.

The researcher also included an open-ended comment box at the end of the survey to gather further subjective opinions of respondents. Participants were encouraged to make any general comments on the precautionary principle and tourism at the conclusion of the survey. Such open-ended questions have the advantage of allowing respondents to articulate their thoughts in their own words, thus allowing the researcher to see how
respondents actually feel about the topic (Weisberg et al., 1996). Some respondents (n=22) chose to submit opinions on the precautionary principle, tourism, and other related sub-topics. However, it should be noted that the number of comments provided is low and not overwhelming, thus not much emphasis was placed on interpreting these results. The researcher coded the qualitative data in order to create preliminary themes from the comments, and to reduce and analytically categorize the data. Table 4.11 presents the comments provided in the open-ended section, which have been grouped into main themes.

Table 4.11

Open-ended Comments

<table>
<thead>
<tr>
<th>Main Themes</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge/familiarity with the concept</td>
<td>11</td>
</tr>
<tr>
<td>Precautionary principle is vital/should be used to enhance sustainable tourism</td>
<td>4</td>
</tr>
<tr>
<td>Too anti-scientific/not a decision-making tool</td>
<td>4</td>
</tr>
<tr>
<td>Cause-effect tourism relationships require greater understanding</td>
<td>3</td>
</tr>
</tbody>
</table>

*Themes ranked according to highest level of response

Table 4.11 indicates that the precautionary principle is still a relatively new environmental planning principle, as 11 participants indicated they had a lack of knowledge and familiarity with the concept. Often, it was their first exposure to the principle and they acknowledged their opinions may change with greater information. In
terms of its potential in tourism, four participants indicated that the precautionary principle is vital and could be used to enhance sustainable tourism planning. A few respondents also relayed their view that the precautionary principle was not appropriate for tourism. Four wrote that the principle was too anti-scientific and not appropriate for tourism. Finally, three individuals wrote that cause-effect tourism relationships require a greater overall understanding.

4.11 Web Survey Response Pattern

As the web survey methodology employed in this study was an alternative to traditional methods of data collection, the researcher also was interested in the particulars of web survey responses (i.e. speed and pattern of responses). During the course of data collection, the researcher was able to track the response pattern of participants. Table 4.12 illustrates that approximately one week after the survey was distributed to all participants, 45 respondents had completed the questionnaire, with that total rising to 60 after two weeks. During the second week, a reminder email was sent to all participants, which increased responses by 20 within a few days. After the third week a letter of appreciation was emailed to all participants, which saw a rise of ten responses within two days. The rise in responses after both the reminder and appreciation emails indicates that repeated contacts may be influential in increasing response rates for this type of data collection.
Table 4.12

*Web Survey Response Pattern*

<table>
<thead>
<tr>
<th>Time Frame (days)</th>
<th>No. of Responses (accumulated)</th>
<th>% of Total Responses (accumulated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>33</td>
<td>33.0</td>
</tr>
<tr>
<td>5-9</td>
<td>45</td>
<td>45.0</td>
</tr>
<tr>
<td>10-14 (reminder email sent on 14th day)</td>
<td>60</td>
<td>60.0</td>
</tr>
<tr>
<td>15-19</td>
<td>81</td>
<td>81.0</td>
</tr>
<tr>
<td>20-24 (appreciation email sent on 21st day)</td>
<td>88</td>
<td>88.0</td>
</tr>
<tr>
<td>25-28</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>
CHAPTER 5: DISCUSSION

5.1 Introduction

The intent of this chapter is to provide interpretation of the statistical results derived from the study. In reviewing the main objectives of the study, this analysis will examine pertinent statistics and compare the findings with relevant literature. Interpretation will focus on significant differences between groups and other variations detected in the analyses. Overall, the study provided few statistically significant findings (perhaps due to low sub-sample numbers); therefore, much of this analysis will offer a rationale for the lack of differences between groups. However, the results of the study do indicate some introductory findings that require greater subjective examination and lend support towards future study.

5.2 Understanding and Opinions of the Precautionary Principle

To begin, the first objective encompassed evaluating the samples' understanding and opinion of the precautionary principle in tourism. As presented in the previous chapter, slightly less than half of the sample (46%) was familiar with the precautionary principle prior to involvement in the study, while another 37% was not familiar with the concept. With this possibility in mind, the researcher had included a definition and description of the precautionary principle prior to completing the survey instrument. The relatively low level of familiarity with the precautionary principle amongst such an educated sample was an interesting result. As indicated in the literature, since the principle's first international introduction and application to the North Sea in 1984, it has become part of many international agreements and environmental legislation in more than 40 countries (Rogers et al., 1997). As well, the precautionary principle has been
examined at most of the recent international environmental forums (Freestone & Hey, 1996), and has been regarded as the most notable anticipatory policy existing in international law with particular application for environmental problems caused by humans (Gollier et al., 2000). Nonetheless, the relatively low level of familiarity with the precautionary principle reveals that the concept is perhaps not well known, and thus requires greater exposure. The researcher acknowledges that the sample's low level of familiarity has repercussions on the validity of the study and in generalising findings. Since only 37% of the sample reported they were not familiar with the principle, it is understood that many of the responses were based on the information provided in the paragraph prior to the questions. The sample may be providing preliminary answers based on the given definition of the precautionary principle without being able to fully comprehend and assess the concept. Although the respondents were familiar with tourism, they were not overly familiar with the precautionary principle. Thus, different results may be derived from a sample more knowledgeable on the precautionary principle. Four respondents indicated in the open-ended comment section that their answers may change with greater knowledge and information on the principle. Overall, these results suggest that the sample has not been overly exposed to the precautionary principle and may have yet to grasp a firm understanding of its essence and potential applications.

When questioned on the resources used to learn of the precautionary principle, respondents reported academic journals as the most frequent answer, followed by discussions with colleagues. However, the numbers were still quite low for these resources, suggesting that little information has been presented on the precautionary
principle with specific reference to tourism. It should be noted that respondents were asked about their familiarity with the precautionary principle in general, with no specific reference to tourism. Nonetheless, these results indicated that the sample was becoming aware of the precautionary principle largely through academic circles (note the majority of the sample were academics). It is most likely that respondents had learned of the principle in journals focused more on environmental planning and policy.

As this sample study included only tourism academics and government tourism officials, it was possible they were not well aware of the precautionary principle since little literature exists in tourism texts or journals. A review of the literature indicated a scarcity of research on the precautionary principle and its application for the tourism industry. Most texts on tourism planning do not examine precaution, while others succinctly mention the concept of precautionary action in brief (Fennell & Ebert, in press). However, the precautionary principle is becoming more prevalent in the policy documents of various non-governmental organizations in which it is applied to the tourism context (e.g. Wilderness Society of Australia, World Wildlife Fund, Convention on Biological Diversity). Although none of these groups fully articulate the content of the precautionary principle, it may be attributed to the notion that the precautionary principle has not been sufficiently considered at the tourism policy level (Fennell & Ebert, in press). A dearth of material on the principle in tourism-specific literature highlights a lack of knowledge and consideration on the principles' application to the sector. Some introductory exposure of the principle in the tourism literature could generate greater debate among tourism researchers and provide further direction for study.
5.2.1 Main Elements of the Precautionary Principle

To assess the sample's understanding and opinion of the precautionary principle in a tourism context, respondents were asked to rate the importance of several fundamental elements of the precautionary principle, as they applied to the tourism industry. Overall, the high mean scores across all variables generally indicate that the participants viewed every element of the precautionary principle as important. Hence, respondents may feel that the precautionary principle embodies an ideology that is critical to the future of the tourism industry.

Of the seven key elements identified in the literature, respondents indicated that "concern for future generations" was of the greatest importance, closely followed by "mankind's ethical responsibility to safeguard nature". Both of these tenets of the precautionary principle are essentially pro-active and future-focused in nature. This finding corroborates with present literature, which suggests that the precautionary principle is analogous to sustainable development. Both concepts embrace an expanded time horizon, as they respect the needs of the present generation while ensuring a sound future exists for the next. Kaiser (1997) points out that the precautionary principle appeals to our sense of controlling risks, and in line with sustainable development, entrusts the present generation to consider and control for the consequences of current action on future generations. Further, deFur and Kaszuba (2002) examined several case studies involving the application of the precautionary principle to environmental decision-making, and found that long-term resource condition or outlook was the most common aspect and the most compelling issue that affected final decision-making. In this study, respondents also reported that exercising foresight and careful planning are the
most integral elements of the precautionary principle's primary features in its potential application to tourism.

Interestingly, respondents indicated that shifting accountability to developers was the least important characteristic of the principle, as evidenced by low mean scores for "passing financial responsibility to developers" and "passing environmental responsibility to developers". Some researchers (Rogers, Sinden, & de Lacy, 1997) perceive the precautionary principle to be most pertinent because it advocates shifting financial and environmental responsibility to those proposing and engaging in tourism development. In relation to tourism, this philosophy would require all the sector's major beneficiaries to share the financial responsibility of internalizing its unprofitable side, namely the costs of providing the associated infrastructure and preserving the natural environment (De Kadt 1990; Krippendorf 1992). Ioannides (1995) and Gunn (1994) assert that no longer should domestic elites and transnational corporations acquire a major portion of the sector's profits without bearing some responsibility for the substantial financial and environmental costs incurred by host societies. However, this study found that respondents placed greater importance on sustainability considerations rather than shifting accountability to developers. This finding may be a result of the notion that, if other elements of the precautionary principle are implemented, then less weight may be placed on shifting those responsibilities. This result also may be reflective of the belief that in understanding and acknowledging the consequences of their actions, developers would likely never agree to accept those responsibilities.

5.2.2 Educating Stakeholders

Since the precautionary principle is a relatively new environmental planning principle and this study is examining its applicability to tourism, it was deemed
worthwhile to query participants on the most relevant manner of educating stakeholders on the principle. Respondents indicated that "workshops/seminars" was by far the most relevant method of educating stakeholders on the precautionary principle in tourism. Workshops/seminars could be more applicable to a wider stakeholder audience and more informative to general society. Workshops could involve more stakeholders and have greater participation, giving a greater voice and level of involvement to smaller or more disadvantaged groups. Such workshops or instructional seminars also may involve case studies or demonstration projects that could provide practical examples and illustrate more hands-on applications for stakeholders.

In terms of the least relevant methods of educating stakeholders, it was interesting to note that respondents selected both "government policy manuals" and "academic literature". As the sample was completely comprised of academic researchers and government employees, their two most direct forms of education and awareness for these specific groups were perceived as the least relevant. Perhaps this is because those forms of education may target select audiences, and thus may not reach a wide array of stakeholders. Exposing the precautionary principle to more stakeholders may be the first step in its introduction to tourism, and there may be more effective forms of education to serve that purpose (i.e. workshops/seminars).

5.2.3 Forms of Implementation

The literature examining the precautionary principle indicates many different potential forms of implementation, depending on the specific industry, its scale and scope. In this study, most respondents (79.0%) indicated that the precautionary principle could be implemented as a "guiding principle" for the tourism industry over other forms
of implementation. This finding corresponds to recent trends in international treaties and accords, as the precautionary principle has been accepted as a guiding principle by many national governments and international entities, such as the United Nations and the European Union. Much research indicates that the precautionary principle may best serve as a guiding principle to be applied in decisions involving uncertainty. O'Riordan and Jordan (1995) report the precautionary principle has been recognized as a guiding principle across numerous international and domestic agreements, even though it provides little in the way of operational guidelines or rigid analytical schema. As some confusion and uncertainty surrounds the prospects of how to practically operationalize the precautionary principle, perhaps it best provides a conceptual foundation for environmental regulatory policy (Gollier et al., 2000). Haas (1997) also agrees that the precautionary principle will effectively serve as a guide in situations involving uncertainty, and O'Riordan and Cameron (1994) believe the precautionary principle should serve as an encompassing principle to guide policy making when scientific certainty does not exist. In recognizing the strong past links between the precautionary principle and its application in protecting marine ecosystems, perhaps the principle holds the most applicability as a tourism planning tool for marine-based tourism. Such tourism, which is predicated on a clean marine environment, may be the most suited of any form of tourism to adapt the principle for specific application (perhaps as a guiding principle).

Interestingly, the least viable forms of implementation were reported to be “national rule of law” (20.0%) and “international binding obligation” (19.0%). Perhaps these percentages were low among the respondents because there is little faith in the likelihood of the principle being incorporated into law for the tourism industry. As well,
there may be little confidence that the principle will have any impact if the measures taken are perceived as too severe (B.A. Smale, personal communication, December 17, 2003). Until more clear and definitive guidelines are provided for determining when and how to apply the precautionary principle, perhaps the concept best serves as a principle to steer tourism planning. The precautionary principle also introduces a narrowing and flattening of the instrumental reasoning approach typical to our current thinking. The principle is characterised as an “irrational” way of thinking and planning because it goes against more “rational” planning structures, which place the profit motive supreme over eco-centric considerations.

5.2.4 Adapted Framework for Implementation

When questioned on the adapted framework for incorporating the precautionary principle into tourism planning, respondents reported high scores of relevancy for all nine steps. This indicates that respondents may perceive each element of the framework as a key step in the implementation process. Specifically, participants indicated that the most relevant step was to "involve stakeholders in decision-making". Evidently, respondents placed emphasis on integrating stakeholder considerations into tourism planning. This concurs with a key element of sustainable tourism literature, which calls for greater stakeholder involvement. Such a process supports the involvement of affected interests in decision-making, promotes greater collaboration and equity among stakeholders, and drives the collection and application of information in accordance with the interests and values of participants (Williams et al., 1998). As a result, more inclusive and integrative planning processes are seen to be integral in moving towards sustainability (McCool &
Moisey, 2001). However, as pointed out earlier, significant difficulties do exist when involving multiple stakeholders and reaching consensus in decision-making.

It is interesting to note that participants rated the step "assume responsibility for demonstrating safety in products and processes" as the least relevant of the framework. This contradicts the impetus of the precautionary principle (and sustainability), which calls for greater caution in preventing harm, even if scientific uncertainty exists. It also lessens the importance placed on shifting accountability or responsibility to those proposing change. Although this step has been identified as a key element of the precautionary principle, respondents indicated that it was the least important criterion in implementing the principle.

5.2.5 Barriers to Implementation

A review of the literature indicated that numerous barriers currently inhibit the implementation of the precautionary principle. In this study, respondents felt that "varying interpretations of the principle" was the most important barrier inhibiting the implementation of the precautionary principle in tourism. This result concurs with literature on the precautionary principle, which suggests that perhaps the greatest problem inhibiting application is the wide variability in interpretations and the lack of a consensual definition (Bodansky, 1994; Dickson, 1999; Kaiser, 1997; Manson, 2002; VanderZwaag, 1999). Since people generally embody different values and ethical standards, disagreement often ensues when deciding what is important to protect or on what to focus (e.g. environmental protection vs. economic gain). It is understandable that such a concern would be paramount as difficulty would invariably be encountered when
trying to reach consensus when facing widespread diversity in stakeholder attitudes and interests. Stakeholders simply do not speak one consensual voice.

Respondents also reported the second most important barrier to implementation of the principle as "vagueness of implementing the principle into specific action". This sentiment concurs with critical thinking on the principle, which recognizes that a lack of clear goals, application standards, management measures, and other key fundamentals would inhibit implementation. Kaiser (1997) acknowledges that even though the principle has acquired the standing of a political/moral norm, it remains vague in how it can be implemented in specific action. Many of the legal instruments and cases citing the precautionary principle have defined and applied the principle in different ways, thus reflecting uncertainty in its application. Moreover, different articulations of the precautionary principle vary in scope of activities covered and strictness of control measures required, with a wide range of management measures used in its application (VanderZwaag, 1999). Even though stakeholders may agree that the precautionary principle holds relevance and merit for tourism, achieving the major tenets of the principle through practical application will be a difficult task. Real barriers must be overcome in order to advance the precautionary principle from a slogan into precautionary action.

Based on the results of this study, it appears the precautionary principle may face many of the same challenges as sustainable tourism. O'Riordan and Jordan (1995) state that much like sustainability, the precautionary principle is neither a well-defined principle nor a firm concept. Sustainable tourism seems to be an exceedingly complex concept with varied definitions due to different interpretations of the meaning and use of
the concept (McKercher, 1993). Welford et al. (1999) state that quite expectedly, the concept of sustainable tourism has not been precisely defined and, like its roots in sustainable development, the term is open to wide interpretation. Respondents of this study also felt that the precautionary principle was open to wide interpretation and lacked clear application standards. Although the principles of sustainable tourism have received much support globally, there remain real difficulties and barriers in the practical implementation of sustainable tourism policies. Critics observe that a great deal of obscurity surrounds sustainable tourism, as it is often not translated into useful action because endless theories regarding the concept have not been operationalized (Welford et al., 1999), nor have its true costs been outlined (Butler, 1998). If the precautionary principle is to go beyond a guiding principle and become a real planning mechanism, then emphasis must be placed on creating strategic implementation measures.

5.3 Key Actors Involved in Implementation

A second key objective of this study was to evaluate which stakeholders would have the power to be involved in implementing the precautionary principle into tourism decision making. Clearly, there are many stakeholders involved within the domain of sustainable tourism, including the host community, government bodies, tourists, the tourism industry (operators), the voluntary sector, and pressure groups (environmental/human rights groups) among others. In this study, most respondents indicated a belief that on the whole, government was the stakeholder that had the power to become most involved. To be specific, the top three respondent choices of who had the power to be involved in the implementation of the precautionary principle in tourism were, in order: local government, state/regional government, and national government.
These findings indicate that government is perceived to be the key entity in planning tourism development over other stakeholders.

This finding concurs with tourism planning literature, which indicates that most often it is government agencies that are responsible for the planning and regulation of the industry. Governments are the legitimate holders of power in the political system, responsible for making policy decisions and establishing procedural guidelines (Elliott, 1997). The tourism industry involves many stakeholders who encompass a complex web of interested parties, which results in difficulty in reaching a consensus because most of these groups have different goals, ethics, ideals, and motivations, ultimately leading to conflict when trying to plan and practice sustainable tourism (Swarbrooke, 1999). Jeffries (2001) observes that the great complexity of tourism products and processes calls for co-ordination and co-operation, which arguably only governments have the authority and resources to organise. Tourism is developed and controlled by the government, whose primary role is governance - the enactment and implementation of laws and regulations. The strong support shown for governments may also be due to the perception that the government has the most experience with the precautionary principle, as it has been applied in international and domestic legislation by government bodies across many sectors.

A wide range of government organisations, departments, and ministries are involved in tourism planning and management and are found at all levels of government including international, national, state/regional, and local. This study indicated that local government and regional government were perceived to be the two entities that had the power to be involved, closely followed by the national government. Gunn (1993)
observes that the regional level of government can provide the greatest tourism planning integration, as this government level of tourism planning is more specific, in that it identifies regional policies and strategies, types of tourism development permitted, regional tour patterns, and also recommends regional techniques for implementing tourism plans. Thus, the regional government tourism departments constitute the senior, policy making element, with subsidiary bodies to take care of operations (Jeffries, 2001).

In comparison, national government tourism planning usually involves the formulation of tourism development policy and strategy, physical structure plans, and methods of policy implementation (Inskeep, 1988). Further, the respondents' top three choices of government bodies were not separated by much in terms of support. Only a few percentage points separated the three levels of government, which indicates that all levels of government should be involved. Inskeep (1988) notes that in tourism planning, the government tourism agency is responsible for achieving implementation yet due to the many inter-sectoral linkages of tourism, various government departments and private agencies are usually involved. Overall, it is perceived that government should be the entity that would take the leading role in potentially applying the precautionary principle in tourism.

However, the question arises as to whether we can entrust government tourism agencies that essentially have local economic development objectives guiding their actions (B.A. Smale, personal communication, December 17, 2003). Smale (2003) points out that tourism development is typically something that happens to communities and not with communities because local residents are rarely empowered to have a genuine role in the process. Perhaps respondents to this survey recognized this circumstance and thus
indicated the host community would have less power to be involved in implementing the precautionary principle into tourism decision making. However, it is possible that the precautionary principle could be used by local communities as an enabling strategy that allows them to take greater control of their own local tourism destinies (B.A. Smale, personal communication, December 17, 2003).

5.4 Academic and Government Stakeholders

A main objective of this study was to compare the tourism academics and government tourism officials in terms of their understanding and opinion of the precautionary principle in tourism. To date, government entities and tourism researchers have yet to comment on the precautionary principle in its potential application in tourism. In examining the responses, some interpretations can be made regarding differences between the two groups. First, no statistically significant differences were found when comparing tourism academics and government tourism officials on their perceived importance of each of the main elements of the precautionary principle. However, government tourism officials placed more importance than tourism academics on shifting environmental and financial accountability to developers. This finding coincides to a growing emphasis on the need for governments to adopt a more critical attitude toward tourism, as Ioannides (1995) suggests that from an early stage policymakers must also account for the negative repercussions on the physical, social, and cultural environments.

Interestingly, government tourism officials rated almost all barriers as having higher mean scores of importance as compared to tourism academics. This indicates that government officials may perceive the precautionary principle as a difficult concept to integrate into current tourism planning and policy. It may also indicate that tourism
academics are more supportive of the concept and believe it could receive some practical application.

Some significant findings were discovered when comparing the two groups in their perception of possible methods of educating stakeholders on using the precautionary principle for tourism. First, tourism academics rated the relevancy of all forms of education as having higher mean scores of relevancy than did government tourism officials. Specifically, tourism academics rated the relevancy of using government policy manuals, films/instructional videos, and educational pamphlets or brochures significantly higher than did government officials. Overall, results indicate that tourism academics may place greater importance on education as a key step in general, or place more emphasis on educating all stakeholders on the precautionary principle. It is interesting to note that government officials rated the relevancy of using government policy manuals much lower than did tourism academics. As the precautionary principle was not that well known amongst the sample, tourism academics may desire greater educative efforts be directed at all stakeholders. Greater exposure of the concept could create more debate and perhaps even shore up weaknesses inherent in the current understanding of the principle. For instance, workshops and seminars attended by academics, government representatives and other stakeholders may be most effective in creating discussion on the principle and mitigating some of the noted barriers in implementation.

In their assessment of the adapted framework for incorporating the precautionary principle into tourism planning, tourism academics rated eight of the nine steps as having higher mean relevancy scores than did government tourism officials. This may indicate that tourism academics place greater emphasis or importance on the viability of the
framework. Tourism academics rated the following four steps significantly higher in relevance than did government respondents: "develop a system to evaluate alternative activities/technologies, etc.", "outline industry-wide standards on when to take precautionary action", "set aggressive goals for achieving sustainability", and "assume responsibility for demonstrating safety in products/processes". From this analysis, it appears that tourism academics are more favourable of the framework than government tourism officials. It is also possible that tourism academics had a greater understanding of the precautionary principle (most had learned of the principle in an academic journal), and were therefore more knowledgeable about its potential application. As well, this framework was essentially developed by academics, lending to the argument that it may receive greater support from this same group. However, it also possible those government respondents would place greater emphasis on other steps that are missing from the framework, steps that practitioners would perceive as more relevant for implementation.

To summarize, both groups reported high mean scores of importance and relevancy for most of the variables examined. In comparison, tourism academics displayed moderately greater support for the precautionary principle in tourism. This sub-sample placed more emphasis on educating stakeholders, rated most barriers to implementation as having less importance, and was more supportive of the framework for implementation. The overall differences found between the two groups somewhat correlate to Jenkins' (1999) suggestion that a "great divide" exists between tourism academics and tourism practitioners. Jenkins (1999) proposes that academics' research would be more effective if less concern was given to impact and more attention was given to the process of practical implementation. Evidently, the two groups may perceive
tourism research in a different context and focus on dissimilar research areas. However, little literature exists on comparing these two groups, especially in terms of tourism planning and none specific to this topic.

5.5 Comparison of All Responses by Geographical Region

Overall, a review of the literature indicated a great deal of variation in the acceptance of the precautionary principle into domestic legislation throughout regions of the world. One of the main objectives of the study, then, was to compare the responses of all participants from the five regions of Canada, United States, United Kingdom, Australia, and New Zealand. As reported earlier, due to the comparatively lower sub-sample numbers for Australia and New Zealand, the two nations were amalgamated into one group. The regional groups were compared on their understanding of the elements of the precautionary principle, methods of educating stakeholders, their perception of barriers inhibiting the implementation of the principle, and their view of the adapted framework proposed for incorporating the principle into tourism industry decision-making.

Interestingly, no significant differences were discovered between any of the groups across all tested variables. Nevertheless, when examining the mean scores for each group, some minor differences should be noted. The statistics indicate similar responses for the four regions in their perceived importance of the precautionary principle's main elements in its potential application to tourism. However, the Australia/New Zealand group reported the highest mean scores of importance for most elements of the precautionary principle, while the Canadian group tended to have the lowest mean scores for all elements. However, the four regional groups were relatively
similar in their perception of the relevancy of each of the nine steps of the proposed framework, with no group reporting overly high or low mean scores.

In comparison to these findings, the literature indicates that the nations of Australia and New Zealand have achieved greater acceptance of the precautionary principle at the domestic level. To date, the precautionary principle has been broadly accepted in policy directives and legislation at all levels of government in Australia, and also has been specifically acknowledged as policy guidance for Australian oceans planning and management (Kriwoken et al., 2001). The precautionary principle also is prevalent in New Zealand's environmental legislation and domestic laws, which embody a chief theme of sustainability. However, with this reasoning the United Kingdom should have also displayed strong support for the precautionary principle, because in Europe it has gained the strongest foothold and has had the most influence on environmental policy than any other geographical region. On the contrary, VanderZwaag (1999) notes that Canada has been slower to accept the principle at the domestic level, deeming Canada's initiatives to implement the principle into law as "hesitant hugs" with unclear practical applications. However, Canada also has gradually begun to implement the precautionary approach in science-based programs of health, safety and natural resources protection (Government of Canada, 2001b).

It is interesting to note that the United States did not have any major differences from the other groups, even though the literature suggests the United States displays the greatest hesitance in adopting the precautionary principle into domestic legislation. Despite its discussion among academics and policy makers in the United States, the precautionary principle has yet to gain the strength and support it has received in Europe
and has only recently been proposed in North America as a new ground for environmental policy (Myers, 2002). While some U.S. policies could be characterized as precautionary in nature, the precautionary principle has not become an official part of U.S. environmental policy and although various levels of government have endorsed it, few, if any U.S. laws cite the precautionary principle (Foster et al., 2000).

These findings suggest that on the whole, there was little variation amongst these groups in their acceptance and understanding of the precautionary principle in tourism. The overall lack of statistical significance, coupled with only some minor variation in measures of central tendency, indicate no clear differences in the responses of participants from different geographical regions. Perhaps such findings are indicative of the understanding among the sample that some elements of the precautionary principle are more likely than others to be implemented within certain political climates (B. Smale, personal communication, Dec. 17, 2003). Tourism development is a political process and is essentially guided by the political party in power, which inevitably changes from time to time.

It should be noted that the precautionary principle is part of many international agreements and environmental legislation in more than 40 countries (Rogers et al., 1997). Thus, most regions have accepted the principle in its application across different sectors. The lack of major differences between the regional groups may signify that as a global industry, tourism faces similar issues and concerns throughout the world. Subsequently, researchers may be searching for similar solutions to common problems. Thus, tourism research is quite encompassing and often focuses on global issues and topics, rather then specific domestic concerns. As well, it should be noted that even though tourism
academics may be based in an academic institution in one region, they could have origins or have studied in other regions of the world. Most often, tourism researchers are well travelled, and thus it is difficult to separate national identities simply by current region of residence. Nonetheless, they are likely most familiar with the issues in the country where they are presently located.

Finally, a lack of statistically significant differences across geographic regions may also support the argument that the precautionary principle is more about values and ethics than regional acceptance. Although some literature characterises the precautionary principle debate as a conflict between North America and Europe, the European Environment Agency (2001) reports differing degrees of acceptance of the need for precaution within different groups and institutions in both North America and Europe. In an examination of case studies involving environmental harm, the EEA (2001) reports that values often determine decisions and a group with a more ecological mindset would select a different course or planning mechanism than would a group focused on economic gain. As examined earlier in the discussion, the values people attach to different sectors of the tourism industry may be most influential in assessing the principle’s potential application.

5.6 Comparison of Tourism Academic Responses by Departmental Affiliation

A final objective of the study was to compare the responses of tourism academics with different departmental affiliations in their understanding and opinion of the precautionary principle in tourism. Overall, no statistically significant differences were found when comparing the three groups [recreation/tourism (n=42), geography/land planning/environmental sciences (n=22), business/commerce/other (n=16)] on their
understanding of the elements of the precautionary principle, methods of educating stakeholders, barriers inhibiting the implementation of the principle, and the adapted framework proposed for incorporating the principle into tourism decision-making.

It was perceived that differences could possibly be found when comparing the three groups with more focused interests and values (i.e. tourism/recreation, environment, business). Again, much of the literature suggests that opinion on the precautionary principle is strongly related to values, as it represents an explicit endorsement of certain values that one attaches to the environment and to society (Kaiser, 1997; Myers, 2002; Raffensperger, 2002). Likewise, VanderZwaag (1999) also notes the importance of values and ethics inherent in one’s opinion of the precautionary principle. VanderZwaag (1999) believes that the precautionary principle is caught between differing world views, suggesting that a group embodying strong ecological values would lobby for extreme interpretations of the principle, rejecting cost-benefit techniques to guide decisions, and transferring the burden of proof onto those proposing change. On the other hand, a group representing a more utilitarian and risk-taking viewpoint would push for moderate interpretations, acknowledging the role of cost-benefit analysis and risk assessment. Thus, these tests were done as a further attempt to understand where any differences might be based among the academics. The resultant lack of statistically significant differences between the three groups can perhaps be attributed to academic’s similar primary interests in the tourism industry. As well, sub-groups within the academic stakeholder group may not truly be representative of different world views. Rather, a study including more tourism stakeholder groups which do embody different values and ethical standards may result in some clear differences when comparing the groups.
5.7 Summary

Based on the outcomes of this study, some initial interpretations have been made regarding the understanding and opinion of the precautionary principle in tourism. This analysis has provided some explanations for the results of the study and linked findings with literature on the precautionary principle and tourism. A good portion of the preliminary results have been shown to corroborate with relevant research and discussion in the literature. However, it should be re-iterated that the interpretations and conclusions based on these results are derived from a small sample of academic and government stakeholders who were surveyed at only one point in time. In order to maintain internal and external validity, generalizations should not be made beyond the acknowledged parameters of this study. However, the results and interpretations do point to some initial conclusions and ideas that will be addressed further in the next chapter.
CHAPTER 6: CONCLUSIONS

6.1 Introduction

As an exploratory study, this investigation sought to provide some insight and preliminary analyses of the potential for the precautionary principle in tourism. Since little research if any has studied the applicability of the precautionary principle specifically to tourism, this investigation links the two research subjects and provides a current understanding of their association. The aim of this chapter is to derive conclusions based on the outcomes of the study and to ascertain the next logical steps for further research. An overview of the contributions of the study also re-affirms the investigation’s importance as a timely examination of the precautionary principle’s potential role in tourism. Lastly, the researcher offers several recommendations for future study on the precautionary principle in tourism and focuses on prospective roles for key stakeholder groups.

6.2 Conclusions of the Study

Given this study was exploratory in nature, the over-arching goal of this investigation was to develop a basic understanding of the potential for the precautionary principle in tourism. To begin, an overall low level of familiarity with the precautionary principle was demonstrated by the sample group. This finding was particularly interesting, given the increasing exposure the principle has received in academic journals, international agreements, NGO statements, government policy statements, and domestic legislative acts to name a few. There is an abundance of literature on the principle in academic journals covering environmental issues, geography, law, trade, and general
human health issues. The low level of awareness was relatively surprising given that the concept has been thoroughly aired in other sectors and disciplines closely related to tourism. As the principle is analogous with sustainability, it was thought that a greater portion of the sample would be familiar with the principle given the exposure sustainability has received in the tourism literature. However, the precautionary principle itself has received little, if any, exposure in the tourism literature. The fact that the precautionary principle has surfaced numerous times in the environment and sustainability literature lends to the perception that although tourism is a multi-disciplinary industry, perhaps tourism researchers are too insular in their approach to study.

In summarising the findings of this study, it is imperative to return to the conceptual framework (Figure 2.1) that guided this research investigation. Developed through the objectives of the study, the framework efficiently synthesised the literature and directed the construction of the survey instrument. The questionnaire examined key elements of the precautionary principle debate and returned responses that satisfied the main objectives of the study. Overall, responses generally indicated positive and favourable opinions for the precautionary principle in tourism, as high mean scores of importance and relevancy were reported for most of the variables tested on the questionnaire. Such findings help to strengthen this initial conceptual framework for the precautionary principle as a planning tool for sustainable tourism and re-affirm the importance of the elements of the framework in the precautionary principle debate.

In evaluating the most important elements of the precautionary principle, respondents corroborated the strong link between the precautionary principle and
sustainability. The sample placed the greatest importance on providing for future generations and mankind's ethical responsibilities to safeguard nature, which are both closely associated with the parent ideal of sustainable tourism. Subsequently, it also was found that the precautionary principle may face many of the same challenges that sustainable tourism has encountered since its inception. The study discovered that varying interpretations of the principle (i.e. different values) as well vagueness in implementing the principle into specific action were the most important barriers impeding the concept's application to tourism. The precautionary principle may face many of the same barriers in tourism that it has encountered in other sectors, specifically how to achieve practical application.

The study also found the most viable form of implementation of the precautionary principle would be for it to act as a guiding principle. This finding corroborated with the literature, as the precautionary principle has received inclusion into numerous legislative agreements as a guiding principle for decision-making. Given this finding, more credence may be given to the belief that the precautionary principle could act as a heuristic device for decision-making. For the tourism industry, the precautionary principle may evolve as a guideline for policy makers against which decision making can be scrutinised.

The finding that government entities have the most power to be involved in implementation of the principle also substantiates the tourism planning literature. Government agencies are the legitimate holders of power and as such are responsible for the planning and regulation of the industry. In terms of education, workshops and seminars were reported to be the most relevant method of educating stakeholders about the precautionary principle in tourism. This form of education is most applicable to a
wide group of stakeholders and may be the most practical method for the principle to gain exposure.

If the precautionary principle is to go beyond a guiding principle and become a real planning mechanism, then emphasis must be placed on creating tangible strategic implementation measures. In this study, the framework for incorporating the precautionary principle into tourism decision-making received high scores of relevance for all nine steps. This preliminary finding indicates that respondents may perceive each element of the framework as a key step in the practical implementation process. The study also found that the most relevant step of this framework was to involve stakeholders in decision-making. Again, this finding corroborates with the sustainable tourism planning literature, which calls for more integrative planning processes and greater collaboration and equity among stakeholders. From this early analysis, it was difficult to ascertain the success of the precautionary principle in acting as a vehicle for sustainable tourism. However, the argument can be made that it may be a practical planning mechanism to implement elements of sustainability into tourism.

It is important to acknowledge that the conclusions of this study should not be interpreted beyond the parameters of this investigation. Although the conclusions are applicable to the results of this study, any change in the parameters (e.g. more stakeholder groups) might have resulted in different outcomes. Thus, any generalizations beyond the study itself would be unwise. If further research were to survey more stakeholder groups from more regions who were educated on the precautionary principle and still found similar results, it may be possible to generalize some of the findings presented in this chapter.
6.2.1 Stakeholder Groups

When comparing the two stakeholder groups, tourism academics and government tourism officials, some minor differences were discovered. Some statistically significant differences were found when comparing the two groups on methods of educating stakeholders and when tested on the adapted framework. However, it should be noted that low respondent numbers for the regional government tourism group make it improper to draw reliable inferences. Nonetheless, the overall responses of tourism academics indicated a greater support for the precautionary principle in tourism. This group placed more emphasis on educating stakeholders, rated most barriers to implementation as having less importance, and was more supportive of the framework for implementation. However, it must be re-iterated that these are initial findings and greater investigation may produce different results or point to other reasons for the variation.

6.2.2 Regional Groups

The lack of clear cut differences between regional groups and across academic departments may suggest that the precautionary principle is gaining greater global acceptance and regional variation may not be that pronounced. Such findings also lend credence to the argument that as a global industry, tourism faces similar issues and concerns throughout the world. Similarly, the imperative of sustainability, in which the precautionary principle is rooted, has received a great deal of attention and acceptance in the tourism planning literature. Lastly, a clear lack of differences may indicate that perhaps people are not educated enough on the precautionary principle to offer informed answers or have not critically examined its merit for tourism. Again, further exposure to
the precautionary principle could increase knowledge and may subsequently change minds and attitudes as well.

6.3 Contributions of the Study

Although the precautionary principle has received study and discussion across several sectors including environmental protection, human health issues and food safety, no study as of yet had examined its potential in tourism. As there was a dearth of literature on the research topic, this study was timely and important because it provided a small beginning or basis from which to assess some initial findings and direct future research. It holds the potential to instigate many diverse paths of inquiry focusing on various issues confronting the precautionary principle. Some of these research avenues are congruent with issues affecting the precautionary principle in other sectors, while many are specific to the tourism industry itself. This preliminary investigation was critical in order to design further systematic and extensive study on the topic, of which there are many avenues.

Although the precautionary principle has recently been mentioned in a few non-governmental tourism agreements and documents, tourism academics and government tourism officials have yet to comment on the principle. As such, this study provided an introductory assessment of the understanding and opinion of these key tourism stakeholders on the potential for the precautionary principle in tourism. Findings derived from this study provide some notion of familiarity with the basic facts, stakeholders, and concerns involved in the research area. It also has determined some level of feasibility in doing additional research on the precautionary principle in tourism.
Closely linked with the imperative of sustainability, the precautionary principle is a timely concept to study, as it has been applied as a guiding principle across several sectors related to tourism. The ideal of sustainable tourism has received a great deal of attention in the literature, yet debate surrounds its operationalisation. The paradigm of sustainable tourism has received criticism because it neglects to provide a conceptual vehicle for policy formulation which explicitly connects the concerns of tourism sustainability with those of sustainable development more generally (Hunter, 1997). Although the ideals it represents are worthy and indisputable, the realisation of sustainable tourism has proven problematic. It is hoped this investigation could spark further study aimed at clarifying the precautionary principle’s role in sustainable tourism; namely, whether it can serve as a conceptual vehicle for policy formulation.

Understanding that exploratory research rarely yields definitive answers, this study was perhaps most effective in establishing a state of knowledge while raising further questions and directing paths for future inquiry. Accepting this condition, it is also prudent to acknowledge that as an exploratory study, all findings were potentially important. The study provided an introductory basis from which to assess the precautionary principle in tourism, and has yielded some preliminary findings that corroborate literature on the precautionary principle, as well as sustainable tourism. This study provided a more definitive understanding of the relevance the precautionary principle may hold in tourism planning, and outlines current challenges facing the concept, as perceived by the two stakeholder groups surveyed. In so doing, it has also generated many ideas and has developed some tentative speculations based on the results of the study.
6.4 Recommendations for Future Study

A key goal of exploratory research is to formulate more precise questions and provide a sense of direction for future research (Neuman, 1997). This research investigation has identified the need for further systematic and extensive study directed by the outcomes and issues raised by respondents. To more easily decipher the roles of key stakeholders in future research involving the precautionary principle and tourism, recommendations have been suggested for some key stakeholders. A starting point would be greater exposure of the precautionary principle amongst stakeholders of the tourism sector, namely literature linking sustainable tourism and the precautionary principle. The range of discussion on the precautionary principle's relevancy and application, as well as its inclusion into a number of international treaties and accords, serves as evidence of its growing stake in several sectors closely related to tourism. As evidenced by the number of respondents with low levels of familiarity, the precautionary principle is still a relatively new concept that has not garnered a great deal of exposure in the tourism sector. With greater knowledge and understanding may come more informed and accurate opinions and critiques.

6.4.1 Methodology

- Future research could include more stakeholder groups as part of the study sample, as there are many other groups with vested interests in the tourism industry. Respondents indicated that all levels of domestic government should be involved in the implementation process. Therefore, further study should query policy makers at the local, regional, and national levels of government tourism administration, as well as the host community, private industry (e.g. tour operators) and international NGOs.
• The sample could include respondents from more nations to gauge a more encompassing global reaction and understanding. The precautionary principle has become part of domestic legislation in over 40 countries; thus, it has increasingly received some measure of global recognition and acceptance. Comparisons also could be made between the responses of participants from most developed countries and least developed countries.

• The present study could be replicated with the same sample in five or ten years and compare results. Within this expanded time frame, the principle should gain greater exposure amongst tourism industry stakeholders. Using the same sample, and with minor re-tooling of the questionnaire, the instrument could return different results than the present study.

• A Delphi methodology may be employed in future study once the concept gains greater exposure among tourism industry stakeholders and researchers. The Delphi technique is a well-established method of collecting expert opinion and of gaining consensus between experts on various unknown factors (Green, Hunter & Moore, 1989). Building consensus on the definitive role of the principle in tourism could help in eliminating barriers reported in this study. As evidenced by the low familiarity with the principle among the current sample, a lack of experts knowledgeable on the precautionary principle in tourism would have made it difficult to build consensus at this time.

• In recognition of the lower levels of familiarity among the various stakeholders who might be surveyed, the questionnaire also could be revised in a few ways. First, a general question might be asked regarding whether respondents consider the
precautionary principle to be a suitable/applicable strategy for tourism development. Second, when judging the importance of the principle’s elements, participants could also be required to rate the elements according to the likelihood that they would be adopted, in addition to their importance (e.g. an expectancy valence approach). Lastly, the question regarding the steps of the framework for implementation of the principle also may require respondents to rank the steps in order of application.

6.4.2 Tourism Researchers

- Future study could closely examine critical barriers to implementation (i.e. different values of stakeholders/vagueness in systematic implementation measures) and propose solutions to overcome them.
- Studies might also strive to gauge further reaction from more stakeholder groups on whether it is an appropriate and practical vehicle for implementing sustainable tourism measures.
- In relation, further study could also focus on a framework or plan for strategic implementation of the principle into tourism decision-making.
- Research also could be focused on other sectors (e.g. marine pollution, health and food safety concerns) that have applied the precautionary principle and use the knowledge or lessons learned from those experiences. As an inter-sectoral industry, tourism holds many links with other disciplines that have incorporated the precautionary principle into decision-making. Research could focus on these implementation frameworks and determine adaptability to tourism planning.
• It also would be worthy to study the relevancy of location-specific factors in determining the applicability of the precautionary principle across certain regions and for different types of tourism development. These factors may include environmental characteristics, host community needs and desires, existing tourism development, and supply and demand components.

• Research also could focus the opportunities for the precautionary principle to be implemented across different spatial, political, and economic scales.

6.4.3 Tourism Practitioners

• Practitioners could investigate as to the scale or scope of tourism that the precautionary principle is most applicable. For instance, does it hold relevance across all types of tourism, or is it more suited for small-scale, nature-based tourism (e.g. ecotourism)?

• As evidenced by the sample's support for workshops/seminars, such interactive discussions should be directed at educating stakeholders on the potential of the precautionary principle in tourism.

• Non-governmental organisations, which have demonstrated some initial inclusion of the precautionary principle into tourism policy documents, could continue with further and more complete articulation of the principle in policy making (e.g. World Tourism Organisation Sustainable Tourism Division; United Nations Environment Programme).

• Government entities could designate the roles of all stakeholders in increasing exposure and implementing the principle into tourism decision-making.
• Government stakeholders could also investigate policy formulation and integration of the precautionary principle into current tourism planning structures.

6.5 Summary

In all, this research investigation has provided a basic understanding of the state of the precautionary principle in tourism. The study has achieved its general purpose of developing a basic understanding of the potential the precautionary principle holds in tourism. While results generated from this study provide some preliminary insight into the research topic, the sample's responses also have been effective in formulating more precise questions and providing a sense of direction for future research. Great potential exists for many avenues of further inquiry directed at assessing the role of the precautionary principle in tourism. As evidenced by its inclusion in other related sectors, the precautionary principle holds the potential to be implemented in some manner, possibly that of a guiding principle or heuristic device for policy makers to follow and apply at various levels across many environmental and health issues surrounding tourism. As global demands on space and resources continue to grow as a function of human population growth, pressure will continue to mount on the tourism sector to implement steps and adopt practices aimed at achieving a more sustainable and environmentally sound industry. With further study and efforts aimed at practical implementation, the adoption of the precautionary principle into the realm of the tourism industry may in time prove to be a sound planning mechanism that actualises the imperative of sustainability.
REFERENCES


Publications.


Ocean & Coastal Management, 31(1), 1-23.


Appendix A: Survey Instrument

The copy of the web-based questionnaire included in this Appendix has been altered to fit the guidelines of this thesis (reduced to 80% of original size).

Brock University
500 Glenridge Avenue
St. Catharines,
Ontario, Canada
L2S 3A1
905-688-5550

Department of Recreation and Leisure Studies
Faculty of Applied Health Sciences

Tourism and the Precautionary Principle:
A Survey of Academic and Government Stakeholders

INTRODUCTION

The aim of this questionnaire is to provide a more explicit understanding of the potential that the precautionary principle holds for the tourism industry. This questionnaire is comprised of four sections: (A) A brief overview of the precautionary principle, which provides a reference to use in completing the survey; (B) The precautionary principle; (C) Application of the principle to the tourism industry; and (D) General questions. This survey has been restricted to government tourism policy-makers and members of the academic community involved in tourism research. This group represents a collection of individuals knowledgeable about tourism who may provide informed responses to the survey. Your time and care in responding to these questions will be of invaluable assistance in determining the applicability of the principle.

SECTION A: A BRIEF OVERVIEW - THE PRECAUTIONARY PRINCIPLE

The precautionary principle, congruent to the ideal of sustainable development, is a controversial future-focused planning and regulatory mechanism that has received a great deal of attention recently in debates on health, safety, and environmental and resource management issues. Proactive in nature, the principle recognizes the limitations of contemporary scientific methods and data, and promotes regulatory action to preclude or avoid environmental harm before it has occurred, even in the absence of scientific evidence linking cause-effect relationships. The precautionary principle is comprised of a number of core elements, including: (i) willingness to take action prior to formal scientific proof (proaction); (ii) passing financial/environmental responsibility to polluters; (iii) concern for future generations; (iv) humankinds' ethical responsibilities to safeguard nature; (v) paying for ecological liability; and (vi) preventative action reduces long-term costs (O' Riordan & Cameron, 1994).

SECTION B: THE PRECAUTIONARY PRINCIPLE

1. Please indicate your familiarity with the precautionary principle, checking all boxes that apply.
   - [ ] Am not familiar with the principle (skip to q.3)
   - [ ] Have published material on the principle
   - [ ] Have read about the principle
   - [ ] Have presented on the principle
   - [ ] Have discussed the principle with colleagues
   - [ ] Other:

2. From what source(s) of information did you learn about the precautionary principle? Please check all boxes that apply.
   - [ ] Newspaper or Popular Magazine
   - [ ] Conference
3. Please check the box that best describes the importance of each element of the precautionary principle, as it applies to the tourism industry.

<table>
<thead>
<tr>
<th>Element</th>
<th>Extremely Unimportant</th>
<th>Unimportant</th>
<th>No Opinion</th>
<th>Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willingness to take action prior to formal scientific proof</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Passing environmental responsibility to developers</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Passing financial responsibility to developers</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Concern for future generations</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Mankind's ethical responsibilities to safeguard nature</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Paying for ecological liability</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Preventative action reduces long-term costs</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
</tbody>
</table>

4. Please indicate your opinion on the following statements regarding the precautionary principle and tourism development. Check the box that best describes your opinion, using the scale shown below.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely Unimportant</th>
<th>Unimportant</th>
<th>No Opinion</th>
<th>Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>The precautionary principle can be employed as a decision-making tool within tourism development which safeguards environmental and human health.</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>The precautionary principle will not constrain future tourism development investment.</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>The precautionary principle could act as a catalyst for enabling people to maintain local lifestyles and traditions (e.g. language, art, clothing, food).</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>The precautionary principle represents a clear endorsement of environmental values in policy</td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
</tbody>
</table>
The precautionary principle could help in protecting historical artefacts and architecture at a tourism destination. 
Uncertainty of the environmental impacts from tourism demands more precaution. 
Implementation of the principle would cause the tourism industry to be more creative and develop products/actions that are more environmentally friendly. 
The precautionary principle will not constrain inter-sectoral economic linkages of the tourism industry. 
Implementing the precautionary principle will not limit the number of jobs created by the tourism industry. 
The precautionary principle could be likened to an extra measure of care for the tourism industry, leading to more complete and rigorous decision making.

SECTION C: APPLICATION OF THE PRECAUTIONARY PRINCIPLE TO TOURISM

This section addresses the potential application of the precautionary principle to the tourism industry.

1. The following is a description of the potential forms of implementation for the precautionary principle in tourism decision-making. Please check the box beside each form of implementation you believe to be viable. Please check all that apply.

- Influential paradigm/method
- Inspirational standard to attain
- Guiding principle
- National rule of law
- International binding obligation
- None of the above
- Other:
2. The following is a list of stakeholders in the tourism industry. Please check the box beside each group if you believe that entity has the power to be involved in implementing the precautionary principle into tourism decision-making. Please check all that apply.

- Host community
- Local/city government
- State/provincial government
- National government
- Private industry (destination zone)
- International NGO/Voluntary sector
- Tour operators
- Tourists
- Other:

3. Please select from the following list any key actor(s) that you believe could have the skill set or level of expertise to implement the precautionary principle into tourism decision making. Please check all that apply.

- Academic/Researcher
- Private industry (e.g. tour operator)
- Local government tourism official
- State/provincial government official
- Federal level government official
- Other:

4. The following is a list of different methods of educating stakeholders on tourism policy. Please check the box that best describes how relevant you believe that method could be in educating stakeholders on using the precautionary principle for tourism.

<table>
<thead>
<tr>
<th>Method</th>
<th>Extremely Irrelevant</th>
<th>Irrelevant</th>
<th>No Opinion</th>
<th>Relevant</th>
<th>Extremely Relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshops/seminars</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Government policy manuals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NGO publications</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Academic literature</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Films or instructional videos</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Educational pamphlets or brochures</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

5. The following is a list of explicit barriers in the implementation of the precautionary principle. Please check the box that best describes your opinion of the importance of each barrier in implementing the precautionary principle for tourism.
6. The following is an adapted framework proposed for incorporating the precautionary principle into tourism industry decision-making. Please check the box that indicates whether you feel each step is relevant as applied to the tourism industry.

<table>
<thead>
<tr>
<th>Lack of consensusual definition on what the principle means</th>
<th>Extremely Unimportant</th>
<th>Unimportant</th>
<th>No Opinion</th>
<th>Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vast spectrum of control measures that could be implemented</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Vagueness of implementing principle into specific action</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Varying interpretations of the principle (i.e. different values)</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Determining the appropriate entity to implement</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Principle negates the requirement to establish causal links</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Other:</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outline industry-wide standards on when to take precautionary action</th>
<th>Extremely Irrelevant</th>
<th>Irrelevant</th>
<th>No Opinion</th>
<th>Relevant</th>
<th>Extremely Relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set aggressive goals for achieving sustainability</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Assume responsibility for demonstrating safety in products/processes</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Create criteria for decision-making under uncertainty</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Use tools for implementing precautionary preventative measures</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Transfer financial responsibility to polluters</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Develop a system to evaluate alternative activities/technologies, etc.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Involve stakeholders in decision-making</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Assume a duty to monitor and assess actions</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
SECTION D: DEMOGRAPHIC INFORMATION

1. Please indicate your age.
   - 20-29 yrs
   - 30-39 yrs
   - 40-49 yrs
   - 50-59 yrs
   - 60-69 yrs
   - 70 + yrs

2. Gender
   - Male
   - Female

3. Please indicate your geographical region of residence.
   - United Kingdom
   - Canada
   - United States
   - Australia
   - New Zealand
   - Other:

4. Please state the highest level of education you have obtained.
   - Some High School
   - High School
   - Vocational/Trade School
   - College Diploma
   - Undergraduate Degree
   - MA/MSc/MBA or equivalent
   - PhD/MD or equivalent

5. Employer:
   - Academic
   - Government
   - Other:

6. Number of years in present occupation: ______ years

7. If you are presently a member of an academic faculty, please indicate your departmental affiliation: Please check all that apply.
   - Tourism/Hospitality
   - Recreation/Leisure
   - Business/Commerce/Marketing
   - Planning/Land Management
   - Geography
   - Environmental Studies/Sciences
   - Other Social Sciences
   - Other:
8. Do you have any other general comments about the precautionary principle and tourism?

Thank-you for taking part in this survey
Appendix B: Pre-notification Email

Brock University
Faculty of Applied Health Sciences
500 Glenridge Ave.
St. Catharines, ON, CANADA
L2S 3A1

Wednesday, May 21, 2003

Dear Participant,

My name is Kevin Ebert, a graduate student at Brock University under the supervision of Dr. David Fennell in the Faculty of Applied Health Sciences. Due to your interest in tourism research, you have been selected to participate in a brief, web-based survey regarding the precautionary principle and tourism.

This survey will be sent to you via email in two days (May 23), titled with the following heading: “Tourism and the Precautionary Principle”.

It would be sincerely appreciated if you would complete the survey at any time over the next four weeks.

Thank you for your time,

Kevin Ebert
MA Graduate Student
Brock University
500 Glenridge Ave.
St. Catharines, ON, CANADA
Appendix C: Letter of Informed Consent to Tourism Academics

Brock University  
Faculty of Applied Health Sciences  
500 Glenridge Ave.  
St. Catharines, ON, CANADA  
L2S 3A1

Friday, May 23, 2003

Dear Participant,

The research project that you are being invited to participate in is entitled, "Tourism and the Precautionary Principle: A Survey of Academic and Government Stakeholders". It is being conducted by Kevin Ebert, a graduate student under the supervision of Dr. David Fennell in the Department of Recreation and Leisure Studies at Brock University. The purpose of this study is to explore the relevancy of the precautionary principle in its practical application to the tourism industry. As such, the aim of this survey is to solicit your opinion regarding two main themes: (i) the precautionary principle, and (ii) the application of the principle to the tourism industry.

As a participant, you are asked to answer the following survey, which will take approximately 15 minutes of your time. The survey has been designed for quick response, as the majority of questions are pre-coded and simply require a box to be selected. You may leave unanswered any question you prefer not to answer. If you so choose, please leave it blank and go on with the next question. Please complete this web-based survey only once.

Participation in this study is completely voluntary, and confidentiality of participants is assured. As all information collected from participants in this study will be aggregated, your name will not appear in any reports, publications, or presentations resulting from this study. The data, with any identifying information removed, will be retained indefinitely and will be securely stored in a locked research office.

The results of this study may assist participants in future research regarding tourism planning and managing for tourism-related impacts. Information collected from this study will be made available to all participants in the form of an executive summary, available after December 1, 2003. Any participant that chooses to receive a summary of the research findings is asked to email the researcher. Participation in this study acknowledges that the participant has read, understands, and consents to the conditions outlined above.
To ensure security, please use the following name and password to access the survey document:

Name: survey
Password: pr03pr

Please complete the survey by clicking on the following link:
http://www.brocku.ca/~webdev/kebertsurvey/survey/

Thank you for your participation in this study.

This study has been reviewed and approved by the Brock University Research Ethics Board (File# REB 02-300).
If you have any questions or concerns about your participation in the study you can contact Kevin Ebert by email at ke97ac@brocku.ca; or contact Dr. David Fennell at 1-905-688-5550, ext. 4663, or by email at dfennell@brocku.ca.

Concerns about your involvement in the study may also be directed to the Research Ethics Officer in the Office of Research Services at 1-905-688-5550, ext. 3035.

Please retain a copy of this email for further reference.

Thank you again for your participation.

Kevin Ebert
MA Graduate Student
Brock University
500 Glenridge Ave.
St. Catharines, ON, CANADA
Appendix D: Letter of Informed Consent to Government Tourism Officials

Brock University
Faculty of Applied Health Sciences
500 Glenridge Ave.
St. Catharines, ON, CANADA
L2S 3A1

Friday, May 23, 2003

Dear Participant,

The following is a request for participation in a research project examining tourism planning and development. It would be sincerely appreciated if this information could be forwarded to one individual within your tourism agency who could effectively answer a brief survey regarding this topic.

Thank you for your assistance.

Dear Participant,

The research project that you are being invited to participate in is entitled, "Tourism and the Precautionary Principle: A Survey of Academic and Government Stakeholders". It is being conducted by Kevin Ebert, a graduate student under the supervision of Dr. David Fennell in the Department of Recreation and Leisure Studies at Brock University. The purpose of this study is to explore the relevancy of the precautionary principle in its practical application to the tourism industry. As such, the aim of this survey is to solicit your opinion regarding two main themes: (i) the precautionary principle, and (ii) the application of the principle to the tourism industry.

As a participant, you are asked to answer the following survey, which will take approximately 15 minutes of your time. The survey has been designed for quick response, as the majority of questions are pre-coded and simply require a box to be selected. You may leave unanswered any question you prefer not to answer. If you so choose, please leave it blank and go on with the next question. Please complete this web-based survey only once.

Participation in this study is completely voluntary, and confidentiality of participants is assured. As all information collected from participants in this study will be aggregated, your name will not appear in any reports, publications, or presentations resulting from this study. The data, with any identifying information removed, will be retained indefinitely and will be securely stored in a locked research office.
The results of this study may assist participants in future research regarding tourism planning and managing for tourism-related impacts. Information collected from this study will be made available to all participants in the form of an executive summary, available after December 1, 2003. Any participant that chooses to receive a summary of the research findings is asked to email the researcher. Participation in this study acknowledges that the participant has read, understands, and consents to the conditions outlined above.

For additional security, please use the following name and password to access the survey document:

Name: survey
Password: pr03pr

Please complete the survey by clicking on the following link:
http://www.brocku.ca/~webdev/kebertsurvey/survey/

Thank you for your participation in this study.

This study has been reviewed and approved by the Brock University Research Ethics Board (File# REB 02-300).

If you have any questions or concerns about your participation in the study you can contact Kevin Ebert by email at ke97ac@brocku.ca; or contact Dr. David Fennell at 1-905-688-5550, ext. 4663, or by email at dfennell@brocku.ca.

Concerns about your involvement in the study may also be directed to the Research Ethics Officer in the Office of Research Services at 1-905-688-5550, ext. 3035.

Please retain a copy of this email for further reference.

Kevin Ebert
MA Graduate Student
Brock University
500 Glenridge Ave.
St. Catharines, ON, CANADA
Appendix E: Reminder Email

Brock University
Faculty of Applied Health Sciences
500 Glenridge Ave.
St. Catharines, ON, CANADA
L2S 3A1

Thursday, June 5, 2003

Dear Participant

My name is Kevin Ebert, a graduate student at Brock University under the supervision of Dr. David Fennell in the Faculty of Applied Health Sciences. Approximately two weeks ago (May 23rd), you were sent an invitation to participate in a brief web-based survey regarding the precautionary principle and tourism.

Given that all information obtained in this study is automatically aggregated into a database, all responses remain anonymous and thus the researcher cannot identify who has responded to the survey. Therefore, if you have not completed the survey already, you are encouraged to participate by clicking on the link below and accessing the survey with the following name and password:

  Name: survey
  Password: pr03pr

Please complete the survey by clicking on the following link:
http://www.brocku.ca/~webdev/kebertsurvey/survey/

If you have already completed the survey, I thank you for your participation.

If you have any questions or concerns about this research project, please do not hesitate to contact me at ke97ac@brocku.ca, or Dr. David Fennell at 1-905-688-5550, extension 4663 or by email at dfennell@brocku.ca.

Thank you again for your participation.

Sincerely,

Kevin Ebert
MA Graduate Student
Brock University
500 Glenridge Ave.
St. Catharines, ON, CANADA
Appendix F: Letter of Appreciation

Brock University
Faculty of Applied Health Sciences
500 Glenridge Ave.
St. Catharines, ON, CANADA
L2S 3A1

Thursday, June 19, 2003

Dear Participant,

Thank you for your participation in the research project, “Tourism and the Precautionary Principle: A Survey of Academic and Government Stakeholders”. This project is being conducted by Kevin Ebert, a graduate student at Brock University under the supervision of Dr. David Fennell in the Faculty of Applied Health Sciences.

Your participation has been critical in determining the applicability of the precautionary principle as a planning tool for the tourism industry. Your responses will help identify the status and potential role of the precautionary principle in the tourism industry, and assist in directing future study on the topic.

If you have not completed the survey already, you are encouraged to participate at latest by Tuesday, June 24, by clicking on the link below and accessing the survey with the following name and password:

   Name: survey
   Password: pr03pr

   http://www.brocku.ca/~webdev/kebertsurvey/survey/

Feedback from this research project will be made available by December 2003. A written explanation will be provided for you upon your request (please email Kevin Ebert at ke97ac@brocku.ca). If you have any questions or concerns about this research project, please do not hesitate to contact me at ke97ac@brocku.ca, or Dr. David Fennell at 1-905-688-5550, extension 4663 or by email at dfennell@brocku.ca.

Thank you again for your participation.

Sincerely,

Kevin Ebert
MA Graduate Student
Brock University
500 Glenridge Ave.
St. Catharines, ON, CANADA