THE INFLUENCE OF CULTURAL VALUES AND REASONED ACTION ON LOCAL ATTITUDES TOWARDS THE MANAGEMENT OF THE INDIAN BAY RECREATIONAL FISHERY PROJECT

ANNA BUFFINGA PASSCHIER

The influence of cultural values and reasoned action on local attitudes towards the management of the Indian Bay recreational fishery project.

by

© Anna Buffinga Passchier

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Abstract

This thesis explored the influence of cultural context and reasoned action on attitudes and beliefs towards management of the recreational sport fish resource in the Indian Bay watershed. The communities adjacent to the Indian Bay watershed are struggling to initiate a new recreational fisheries management strategy which contains two potentially conflicting objectives: (1) to allow continuation of current local recreational angling that has its roots in a traditional open access attitude towards the land and resources of the Indian Bay watershed; and, (2) encourage a stronger recreational sport fishery for non-residents.

The traditional open access attitude might be part of a cultural belief system which becomes a filter through which new information is interpreted. This was explored using Cultural Paradigm theory. Generally, the values for communities in the vicinity of the Indian Bay watershed could be characterized as 'Humanity-oriented' with greater influences from 'Individually-oriented' values, as compared to 'Whole earth/ecosystem-oriented' values. The emphasis on egocentric values would be consistent with the Newfoundlander's historical reliance on the land for subsistence and the attitude of a traditional right of access to Crown land and resources for personal use. The resource manager must first address these values before proposing new initiatives.

The traditional open access attitude was further explored through the Theory of Reasoned Action and persuasive communications. The thesis examined the cognitive

structure of behavioural beliefs and evaluations underlying specific attitudes towards management proposals. Pearson correlation and step-wise linear regression were applied to define the attitude/belief structures that could be targeted by persuasive messages. While there was moderate support for this 'traditional' access, it was a sub-theme found in the predictive relationships of key beliefs influencing attitudes towards sport fish development. The underlying traditional values need to be addressed in order to move the management agenda from conflict to cooperation between managers and the people who use the resources. Overall, the results of the study reconfirmed the profile provided by Hill (1984) on the value of wildlife to Newfoundlanders whereby personal and utilitarian values, and provincial economic values, are given priority over environmental/wildlife conservation. The key difference is the greater willingness of the people in the Indian Bay area in 1997 to accept controls. There are significant opportunities for persuasive communications and consultation to influence ambivalent attitudes regarding regulatory and development initiatives into favourable attitudes.

Subsequent events leading up to the proposed provincial 'Outdoor Bill of Rights' suggest that the emotional response to any threat to this traditional value should not be underestimated. Managers need to ensure that they address the various aspects of the traditional access issue in their day to day communications. More importantly, the results of the study emphasize that managers in the Indian Bay area need to consult with their public in a meaningful and consistent manner in order to prevent emotionally charged conflicts that undermine rational policy development.

Dedication

To my daughter

Henny

and

my parents

Anton and Jannetje Passchier

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1.0 Introduction

1.1 The Research Question

The communities adjacent to the Indian Bay watershed are struggling to initiate a new recreational fisheries management strategy which contains two potentially conflicting objectives: (1) to allow continuation of current local recreational angling that is very much part of the rural Newfoundland lifestyle and, at the same time, (2) encourage a stronger recreational sport fishery for non-residents (Wicks, 1996). This new strategy is intended to inject new monies into a slow economy, nonetheless the prospect of sharing the fishery resource with non-resident anglers is a concern to local residents. Local residents are apprehensive that this strategy might result in restrictions to local access to the land and resources of the Indian Bay watershed.

Newfoundland has a history of conflict between resident and non-resident users of wildlife resources based on the perception of unequal treatment by governments responsible for managing the resource (McGrath, 1996). According to Buchanan *et al.* (1994), the key challenge to the successful development of the recreational sport fish resource in Indian Bay is the need for a change in the attitudes of local anglers:

> "Local anglers must change their belief in a traditional attitude of open access to the land and resources of Indian Bay to an attitude that supports restrictions to access in order to secure a quality recreational fishing experience for guests of outfitting operations." (Buchanan *et al.*, 1994)

Given the historical 'right to the commons' values of rural Newfoundlanders (Omohundro, 1994), this conflict have the potential to spark public controversy in the Indian Bay watershed area.

The purpose of this thesis is to explore the implications of the cultural value of traditional open access to the land and resources for new management and development proposals for the Indian Bay watershed. The thesis question was formulated as a series of questions: Is the attitude of traditional access still prevalent? Is there a cultural value context which supports this attitude? What is the current cultural value context of the local communities involved in the decision-making for the management of the Indian Bay watershed? Are there underlying predictive relationships between key attitudes and beliefs that can be targeted by persuasive messages in order to gain acceptance of new management proposals? The answers to these questions would enable resource managers to develop more responsive resource management plans and design effective educational messages to facilitate acceptance of new management measures.

1.2 Literature review

1.2.1 Attitude research in the field of geography

The study of the interaction between people and the environment is an established area of research for geographers (Mitchell, 1989). Research conducted in this human-environment tradition were often under headings such as, environmental perception, environmental behaviour, human ecology, psycho geography and human geography (Saarinen, 1976). There has been an increasing amount of work being done on human

perception and behaviour, in particular for resource management and environmental issues (Mitchell, 1993). This appears to correspond with the increasing involvement of citizens in the decision-making processes of resource management agencies (Bright and Manfredo, 1995). The growing demand for public involvement has required resource managers to consider a wider range of factors beyond the conventional approach to resource analysis which focussed primarily on the biophysical components. The inclusion of the human dimension in resource management decision making represents a significant change from traditional practise. The need for integrating the human dimensions component into resource management practise has been clearly identified in the literature (Hendee and Schoenfeld, 1973; Christensen and Clarke, 1983; Fazio and Rattcliff, 1989; McCool and Ashor, 1986; Norman *et al.*, 1989; Stroufe, 1991; Frentz, I. C. *et al.*, 2000; Ewing. S. *et al.*, 2000). Natural resource management is interdisciplinary by definition, and as the public continues to become more aware and informed on resource management issues, the need for a social science component in decision making becomes essential (Bright and Manfredo, 1995).

More and more, resource managers are undertaking human dimensions research in the areas of public knowledge and attitudes in an attempt to effectively address public issues and concerns. In particular, the authors indicate the need to address the lack of public knowledge and the need for education in order to gain support and cooperation for resource management initiatives from an informed public. There is a recognition that there is a need for managers to manage people (Ditton, 1977; Bryan, 1982; Voiland and

Duttweiler, 1984; Larkin, 1988; Matlock *et al.*, 1988; Kellert, S. R. *et al.*, 2000; Selin, S., 2000).

> "Natural resource agencies...have commented that communication with their various publics is a major barrier to the conduct of their mission." (Ewing, S., 2000).

These trends in education and public involvement reinforce the importance of perception and attitude studies as a meaningful area of investigation for geographers (Mitchell, 1989), particularly from an applied perspective for resource managers. However, "Research on attitudes in the natural resources field has generally lacked a theoretical foundation..." and on that basis the quality of attitudinal information has been questioned (Bright and Manfredo, 1995). For this thesis, two important theoretical approaches will be used: cultural paradigm theory which originates from the environmental movement and wildlife valuation research; and the Theory of Reasoned Action which has its foundation in social learning theory.

1.2.2 Recreational fish literature review

A review of the type of human dimensions literature in the recreational fishing area found that there was a considerable body of behavioural research which became progressively more sophisticated in approach since the 1970's. The earlier studies addressed motivations for fishing and angler preferences for management policies which had direct application to the formation of fishery management strategies (Moeller and Engelken, 1972; Knopf *et al.*, 1973; Bryan, 1977; Ditton et al., 1978, Dawson and Wilkins, 1981). Other studies focussed on the characteristics of anglers, motivations for

angling, trip satisfaction, and examination of the variables which could influence management preferences (Schoolmaster et al., 1985; Chipman and Helfrich, 1988,).

More recent research ranged from looking at the quality of angling experience in New Zealand (Tierney and Richardson, 1992), to angling substitution choices in Texas (Choi et al., 1994), the examination of the behaviours and values of trout anglers in Michigan (Gigliotti and Peyton, 1993), and fishing trip satisfaction in Minnesota (Spencer, 1993). An annotated bibliography focusing on "Recreational Fishing - The Human Dimension" which reviewed six major journals for the period of 1980 to 1994, resulted in 131 articles (Hunt and Haider, 1996). These papers were categorized by several primary themes, of which two are of particular interest to this thesis: applied behavioral concepts (45 articles) such as, satisfaction, motivation, substitution and norms, and behavioral antecedents (8 articles) which deal with choice, preferences and perception.

This thesis focuses on beliefs and attitudes under the behavioral antecedent category which is definitely a minority area in the field of human dimensions research. The literature indicates the need to look beyond angler motivations in order to understand whether they translate into behavioural choices (Fedler and Ditton, 1994). Since 1995, the topic has continued to gain interest with regular articles published in the new journal of Human Dimensions in Fish and Wildlife Management. Ultimately, the success of a resource management strategy relies on support from those who use that resource. For

Newfoundland anglers, success is in continued angler use of the Indian Bay watershed and angler compliance with new management measures.

1.3 Context for this Thesis

1.3.1 The Thesis Study Area: Indian Bay watershed.

The Indian Bay watershed, located in the Bonavista North Peninsula, was chosen as the thesis study area. This watershed was proposed as a pilot project by the Newfoundland government in 1997 for a new approach to recreational fisheries management. This presented an opportunity to explore potential public reaction to possible management measures that were under consideration for the land and resources of the Indian Bay watershed. The most recent amendments to the federal Fisheries Act in 1996, opened the possibilities for 'community-based' recreational fisheries management, whereby the communities adjacent to the resource would have greater participation in management including decision making on issues of access, bag limits, gear type, and season. At this time the Indian Bay Ecosystem Corporation (IBEC) was established to undertake this initiative. Traditionally the recreational fish regulations were managed by the federal Department of Fisheries and Oceans (DFO), with some involvement by the provincial government. This new community watershed approach represented a significant departure from traditional management practise.

A high priority issue for IBEC was to increase economic return from this resource, particularly from non-resident anglers who were "...characterized by their willingness to pay for an enhanced fishing experience..." (Buchanan, *et al.*, 1994). The Buchanan report

which formed the basis for the establishment of the Indian Bay pilot project clearly stated that a change in attitudes was necessary if this was to be achieved:

> "A change in attitudes must occur if we are to have quality angling for both the resident and nonresident angler. High quality of the angling experience is the key to ensuring that the province will capture sustainable economic benefits from the resource.....local anglers will have to compromise in their use of quality fishing waters if economic benefits are to be realized from a nonresident fishery." (Buchanan, *et al.*, 1994).

This goal represented a clear departure from traditional use and management of the resource which focussed mainly on domestic angling and generally involved minimal and broadly applied management measures.

1.3.2 History of conflict.

This conflict scenario (local versus non-resident use for tourism) is not new to Newfoundland wildlife resource managers. Since the 1800s there have been "more-or-less vigorous attempts to promote tourism in the province...based initially on hunting, fishing and climate."(Seymour, 1980). Promotional literature, such as the publication "Fishing and Shooting in Newfoundland and Labrador in 1903, described Newfoundland as a "sportsman's paradise abundant in caribou and other game (Pocius, 1994; Overton, 1996). Even during the introduction of the Game Board Bill in 1910, it was stressed that the colony's wildlife needed protection since it was a valuable economic asset that could help increase tourist traffic. Yet the majority of Newfoundland's settlers were fisher folk and hunting played an important part in their economic activity (Story, 1990; Nemec, 1993).

> "Newfoundland is probably the only country in the world where venison, salt or fresh is a staple article of diet for the masses." (McGrath, 1993).

The evidence suggests that by the early twentieth century there was social tension and conflict surrounding the use of wildlife resources in Newfoundland. Settlers involved in a subsistence lifestyle saw wildlife resources as food and income, while government and tourism promoters saw the same resources as important components of the tourist trade (McGrath, 1994). This tradition of harvesting off the land could set the cultural paradigm context that conditions the goals and expectations of local residents.

More recently the same wildlife resource use conflict between local hunters and anglers versus outfitters caught public attention, first in the mid-1980s with the establishment of the Wilderness & Ecological Reserves Act in 1983, and later in 1987 with the introduction of the Government policy paper: "Discussion Paper on Commercial Hunting and Fishing Camps in the Province of Newfoundland." The perception of infringement on 'traditional rights' of access to land and resources again flared in 1990, when Bill 53, "An Act to Revise and Consolidate the Law Respecting Crown Lands, Public Lands, and Lands of the Province" was decried by the public as 'the Outfitters Bill'. It was suggested that the provincial government was considering the possibility of leasing the Indian Bay watershed for outfitting purposes. Despite the controversy, in 1991, the Economic Recovery Commission (ERC) released "A Proposal to Commercialize the Atlantic Salmon Fishery in Newfoundland and Labrador" suggesting that salmon rivers be leased to outfitters. This was followed in 1992, by the ERC

presentation "A Community-Based Salmon Sports Fishery: A Proposal to Localize Control and Economic Impact of the Atlantic Salmon Sports Fishery" which recommended that salmon pools be designated for the exclusive use of outfitters. In 1994, public tension arose over the fact that tourists on tours boats were allowed to jig a cod fish while licensed fishermen affected by various fisheries moratoria were not.

In the same year, the Buchanan report was released which formed the cornerstone for proposed changes to the management of the recreational fishery in Newfoundland. While the report indicated that the authors recognized the right of equal access for all Newfoundlanders, Labradorians, Canadian, and visitors alike, they also indicated that access does not necessarily mean free or uncontrolled access. However, as Omohundro, (1994) points out, "Newfoundlanders have always put up a stiff resistance when their right to the commons was threatened." Therefore, despite all other considerations, this emotional response to a perceived threat to a core ideological belief (Thompson and Gonzalez, 1997) might, in the end, determine the policy direction taken by managers in the Indian Bay watershed.

1.4 Theoretical basis for the thesis.

This methodology of this thesis is based on theory which examines the relationship between beliefs, attitudes, and behavioural intentions, to provide a basis for understanding public response to management proposals. As stated previously, the premise that all Newfoundlanders feel that they have a traditional right of access to land and resources is at the crux of reaction to proposed changes to wildlife management

regulations which could be interpreted as infringing on this right. However, while this argument has been put forward by outdoor rights interest groups (see Chapter 2) and has received media attention, there has been no analysis on the underlying beliefs that influence attitudes towards resource management preferences of Newfoundlanders.

In order to explore the attitudes and beliefs of the people in the Indian Bay area regarding the potential conflict between traditional open access values and the need for these to be modified in order to gain local acceptance of new management proposals, two theoretical approaches were used: Cultural Paradigm theory and the Theory of Reasoned Action. Cultural paradigm theory postulates a social and cultural basis for attitude development. Essentially the basic values of society influence an individual's reaction to an environmental issue and individuals make decisions based on pre-existing models (Kempton, 1995). This history of subsistence use of wildlife and the high level of current participation in wildlife harvesting activities would appear to be an important cultural influence on attitudes and beliefs of the people in the Indian Bay area. Principal components analysis was used to explore Cultural Paradigm Theory.

The Theory of Reasoned Action is primarily concerned with identifying the factors underlying the formation and change of attitudes and beliefs which influence behaviour, or behavioural intention (Fishbein and Ajzen, 1972, 1975, 1981). It provides the theoretical basis for assessing the potential for changing behavioural intention through targeted persuasive communication that appeal to reason. The Pearson product moment correlation and step-wise linear regression were used for the Theory of Reasoned Action

to explore predictive relationships between attitude/belief structures. If these value structures were better understood, resource managers could target persuasive messages towards the beliefs and attitudes which have the most influence on the individual's actions. This knowledge would enable the resource manager to develop more responsive resource management plans and design effective educational messages to facilitate acceptance of new management measures.

2.0 Review of Literature and Context of the Thesis Study Area

2.1 Introduction

This chapter will outline the trends in human dimensions research in the recreation sport fishing literature. However, there has been no previous attitude research conducted in Newfoundland with a focus on the interrelationship of attitudes, beliefs and behaviour in the recreational fish management context (Curnew, pers. com., 1999). Therefore, in section 2.3, an overview of Newfoundlander's use of fish and wildlife resources is provided, along with the results of three papers which explored the value of wildlife to Newfoundlanders. In section 2.4, the people and resources of the Indian Bay area are described in order to provide an understanding of the context of the survey area.

2.2 Literature Review

2.2.1 Human dimensions research in the recreation sport fishing literature

Previous research indicates that the writing on angling is greater in extent and diversity than for any other branch of sport. In fact, it has been claimed that a full bibliography would go back almost five centuries and would contain more than fifty thousand entries and that trout would be found to be the most written about fish from the sport perspective (Bryan, 1977). However, from the resource manager's perspective, the professional literature on recreational fish management and particularly a theoretical framework for human dimensions research, is relatively recent. The literature indicates a recognition that managers need to protect a resource and provide users with a variety of opportunities (Ditton *et al.*, 1978; Propost and Lime, 1982; McCool *et al.*, 1984) and that

managers need to manage the people who use the resource (Ditton, 1977; Bryan, 1982; Voiland and Duttweiler, 1984; Larkin, 1988; Matlock *et al.*, 1988; Hahn, 1991). Overall, the publications tend to be issue and location specific and have not addressed the development of research theory. In order to provide some order to the wide range of themes found in the fifty-nine relevant articles collected in the literature search, the categories used by Hunt and Haider (1996) were used to classify the primary focus of the papers as they relate to the human dimensions research. The categories are: Behavioural Concepts (twenty-one articles); Behavioural Antecedents (ten articles); and the 'other' category which reflects the diversity of research (twenty-eight articles).

The behavioural concept category includes articles dealing with angler satisfaction, motivation, (activity) substitution and norms. As early as 1967, motivations were exmained from an incentive approach by looking at the goals and objects which motivate behaviour. Motivations and expectations can then be changed by education programs (Dawson and Wilkins, 1980). However, Huggins and Davies (1984), showed that, after looking at satisfaction and not motivation, they found that expectations differ from river to river and this should be considered in an examination of anglers. In addition, the type, amount, and obtrusiveness of managerial activities that shape the nature of a recreational setting, have been found to change the experience and possibly hinder the objectives of the recreationists (McCool, *et al.*, 1984). Feather and O'Brien (1987) concluded that motivation from a cognitive approach requires an intellectual

process within a person, and includes analysis and interpretation of the environment around the person.

In the early 1980's, the concept of recreation specialization was examined and a study of anglers showed that it was predominantly behaviour which defined the level of specialization, with attitudes and motivations being considered based on these behaviours (Bryan, 1977; Gill, 1980; Bryan,1983; Chipman and Helfich, 1988.) While specialization fits in with the logic that opinions and motivations of anglers are not fixed and change over the lifetime of the angler, Condell *et al.* (1990b and 1990a) saw specialization as too simplistic an explanation for predicting attitudes and behaviour and proposed that location and situational factors played a stronger role in decision making.

Research by Clarke and Stanley in 1979 and Fedler and Ditton, in 1994 indicated that the motives for engaging in the activity, the style of participation, and the resulting experiences can vary dramatically from one area, or species, to another. Angling is therefore a situational activity. Moreover, similar behaviours by different people participating in a day of fishing may be associated with notably different internal patterns of motivation (McCaslin, 1990). Other research examined visitor and local satisfaction (Herrick and McDonald, 1992; Holland and Ditton, 1992), the quality of angling experience in New Zealand (Tierney and Richardson, 1992), and fishing trip satisfaction in Minnesota (Spencer, 1993). Research by Buchanan *et al.*, 1982 and Martinson and Shelby in 1992 explored how managers could use knowledge of motives and expectations to direct users to alternative locations on a river, or other rivers. With a better

understanding of how motivation relates to behaviour, managers can more easily anticipate angler response to management actions and can ensure that the angling expectations are met (Fedler and Ditton, 1994).

The category behavioural antecedents include articles dealing with anglers choices, preferences and perceptions. The relevance of angler perceptions, attitudes, and preferences to regulations was discussed by Dawson and Wilkins in 1981 and Renyard and Hilborn in 1986. Different streams attract different types of anglers (Palmer, 1988) indicating individual preferences for the particular mix of scenery, angling experience, logistical arrangements offered by different streams. Clarke and Downing (1984) explored the choice of fishing location and reaction to management activities such as grazing or logging, and concluded that management concerns differ according to the fisherman's resource orientation or specialization, and angling preference (Bryan, 1977). Thus, a better understanding of anglers by managers would help them to manage the resource to enhance the angling experiences (Brown and Siemer, 1991). The link between angling specialization and expectations in the fishing experience was examined by Tierney and Richardson (1992) and Martinson and Shelby (1992) who published articles outlining the distinct differences between salmon anglers and trout fishermen. Angling substitution choices in Texas were examined by Choi *et al.*, 1994. Fedler and Ditton (1994) reviewed seventeen studies regarding incentives for angling and found that psychological-physiological incentives were rated highly while natural environment incentives were treated moderately to very high by most anglers.

The review of sport fishing literature for attitude, belief, and behaviour research produced many articles that contributed to an understanding of the sport, the challenges to management, and an appreciation of the many individual components of the recreational angling research. However, for lack of another specific category, these articles are classified as 'other'. Knopf *et al.*, (1973) stated that a comprehensive approach was needed to angling research including an evaluation of the resource, the activity, economic considerations, and participant behaviour. They concluded that the role of managers should be considered as their decisions affect places recreationists go. Clarke and Downing (1984) and Stroud (1976) showed that fishing participation decreased after introduction of catch and release and size restrictions. It was pointed out in the literature that managers and anglers can have different perspectives of what constitutes a resource management conflict (Gramann and Burdge, 1981). Moreover, the difference in what a manager recognizes as a satisfactory fishing experience versus the angler's expectation has caused tension between the angling public and agencies (Huggins and Davies, 1984). Research has identified not only the need for the examination of angler responses to regulatory measures, but also that the research needs to be context specific (Palmer, 1988; Ditton and Fedler, 1989). Management plans that include considerations of the angler and seek to inform anglers about the reasons for regulations are more likely to succeed both socially and biologically (Quinn, 1992).

Yet, even if a management agency has implemented management measures with an intended outcome, it has been demonstrated that few recreational users learn about an

area through information from agencies; informal contacts form the most important source of information (Clarke and Downing, 1984). Other sources of information include the recreational communication network described by Bryan (1982), and fishermen's communications networks documented by McDonough, *et al.* (1987). There are few studies available to assist managers in developing, evaluating and refining communication techniques (Brown *et al.*, 1987).

Further research examined the concept of willingness to pay for an enhanced angling experience (Adamowicz *et al.*, 1993), the role of education in managing anglers and the resource (Spence and Spangler, 1992), the effects of crowding on the angling experience (Hammitt, 1983), conflict management (Gramann and Burdge, 1981), and the behaviours and values of trout anglers in Michigan (Gigliotti and Peyton, 1993). Hunt and Ditton (1997) explored the social context of site selection for freshwater fish by comparing site preferences between social units of participation. The units were defined by the social unit the individual fished with most often, such as, friends and family, friends alone, or all alone. The results indicated significant differences between the social units regarding site attributes that can be manipulated by managers, including facilities, services and resources. It is significant that all social units regarded the following attributes as very important to site selection: access, user fees, escape motivations, and the chance of fishing success.

Researchers have also called for the need to look beyond angler motivations to understand whether they translate into behavioural choices (Fedler and Ditton, 1994).

While the literature contains recommendations for the development of a behavioural approach to fisheries management policies (Moeller and Engleken, 1972; Hampton and Lackey, 1976; Carpenter *et al.*, 1977; Bryan, 1977; Ditton *et al.*, 1978; Smith, 1980; Dawson and Wilkins, 1981; Huggins, 1984; Miranda and Frese, 1991; Mitchell, 1993), the research effort remains sparse.

As a result, the theoretical basis of this thesis relies on the work done in two particular areas: (1) the social and cultural context for environmentalism explored through the development of attitude paradigm research (Eagly and Kulsea, 1997), and (2) Fishbein and Ajzen's Theory of Reasoned Action (1975, 1980, 1985).

2.2.2 How Newfoundlanders value recreational fish and wildlife resources.

The statistics published by Environmental Canada (1996) regarding the importance of wildlife and nature to Canadians describe the level of participation by Canadians in outdoor activities ranging from low intensity non-consumptive activities such as residential wildlife-related activities, wildlife viewing, through to the consumptive use of wildlife. In fact, 83% of the Canadian population (aged 15 years or over) participated in a wide range of nature-related activities; with fishing attracted 31% or 138,000 participants (Environment Canada, 1996). In 1996, Canadians spent an estimated 1.5 billion days enjoying one or more nature-related activities; 86% of the Canadian population indicated that it is important to maintain abundant wildlife.

Newfoundland residents lead the country in recreational fishing activity. In the statistics published by the Environmental Canada in 1996 regarding the importance of

wildlife and nature to Canadians, Newfoundlanders had the highest percentage of users proportional to population for the number of residents who participated in fishing, the number of days per year that they fished, and the estimate of latent interest in future participation in the sport (see Table 2 - 1).

In terms of the economic value of this activity, these reports indicated that Newfoundlanders spent $230 per person per year on recreational fishing as compared to $462 per person per year for Canadians. Overall, Canadians spend $1.9 billion for recreational fishing in Canada. (Environment Canada, 1996). Buchanan (1994) reported that resident Newfoundland anglers spent $387 in direct expenditures annually for recreational fishing. This was broken down further to indicate that nonresident/ non-Canadians spend $279.07 per day, and nonresident Canadians $162.22 per day, as compared to residents who spend only $17.58 per day (Buchanan *et al.*, 1994).

However, it is important to note that despite the high level of involvement in direct wildlife consumption through hunting and fishing, Newfoundlanders had the lowest support in Canada for the statement that maintaining wildlife is very or fairly important (80%). Moreover, across Canada, Newfoundlanders showed the least support for paying to protect habitat (49% compared to 60%) or declining or endangered species (39% compared to 52%) as shown on Table 2 - 2.

In terms of publications focussed exclusively on Newfoundlander's attitudes towards wildlife, only three research projects could be found: Hill (1984), Condon

Table 2 - 1: Recreational fishing in Newfoundland (Environment Canada, 1996)

Activity	Location	1991	1996
% residents participating in recreational fishing	Newfoundland	38%	31%
	Canada	26	18
Number of days per year for sport fishing	Newfoundland	17	24
	Canada	14	17
Latent interest expressed as great or some interest in participating in recreational fishing	Newfoundland	63	49
	Canada	52	40
Latent interest expressed as great or some interest in participating in hunting	Newfoundland	36	27
	Canada	16	11
Expenditures on recreational fishing activities	Newfoundland	-	$230 per participant
	Canada	-	$462 per participant

Table 2 - 2: Newfoundlander's willingness to pay to protect wildlife
(Environment Canada, 1996)

Questionnaire statement	Newfoundland	Canada
Maintaining abundant wildlife is very/fairly important	80% (lowest in Canada)	86%
Willing to pay to protect habitat for abundant wildlife through increases of 1 - 5% on taxes or prices on 4 selected items.	49% (lowest in Canada)	60%
Willing to help pay to protect declining or endangered wildlife from pollution through increases of 1 - 5% on taxes or prices on 5 select items.	39% (lowest in Canada)	52%

(1993), and Condon and Adamowicz (1995). They provided valuable information for consideration in the design of this research instrument. In particular, the key conclusion from Hill's 1984 research indicated that:

> "...Newfoundlanders indicated a high level of interest in wildlife and the environment and recognized the importance of maintaining healthy wildlife populations ... however, when put in the context of economic welfare, this interest was heavily tempered with the views that improvement of personal and provincial economic situation have priority over environmental/ wildlife conservation and management." (Hill, 1984).

Condon (1993) points out that "...a major constraint to integrated resource management in Newfoundland is inadequate information on forest land values apart from commercial timber." She seeks to find an instrument to adequately quantify these other values using contingent valuation methods (CVM). She defines CVM, or 'willingness to pay' as the amount of money an individual would pay to obtain change and still be as well off as before the change. Her conclusions were: 46% of the hunters would not pay any more than they already pay in the CVM question dealing with doubling the season length and/or increased out-of-pocket expenses and 46% stated that they could not afford or would not pay any more than they already paid in the contingent valuation question dealing with seeing twice as many moose and/or increased out-of-pocket expenses during the season. For comparison purposes, in Kansas a similar CVM survey found that 61% of the hunters indicated that they were not willing to pay for private hunting access (Goodwin *et al.*, 1993). Further, when hunters in Newfoundland were asked to rank the reasons for moose hunting (choices given were sport, food, recreation, or other) in order of importance, food

ranked first 67% of the time. Condon concluded that it is likely that moose hunters would not be willing to pay much more for moose hunting than for the equivalent amount of meat that could be purchased from the market (Condon, 1993). This raises the question as to whether the local sport fishery would have a similar response to 'willingness to pay'.

Condon and Adamowicz (1995) further examined Newfoundlanders motives for outdoor recreation and use of wildlife through a household moose hunting survey. When asked to prioritize reasons for going on an outdoor trip, the responses ranked as follows: opportunities to view wildlife, to fish, to take part in activities with friends or family, and naturalness of the area or lack of development. Regarding fundraising to improve recreation opportunities and habitat enhancement, the following sources were listed in order of acceptance: lottery funds, donations, sale of wildlife stamps and/or memberships, and increased hunting and fishing fees. However, when respondents were constrained to choosing only one mechanism, 36% chose lottery funds and 22% chose increased hunting and fishing fees.

In summary, the two key conclusions which provide direction to further research are (1) that wildlife is important to Newfoundlanders, with an important qualification favouring utilitarian values, and (2) that there is a limited 'willingness to pay' for maintaining or improving that resource.

2.3 History of conflict between local and non-local wildlife users

The attitudes and beliefs regarding the use of wildlife held by the people living in rural Newfoundland have been shaped by a history of relying on wildlife resources as a

source of food and income. Like elsewhere in North America, the first European settlers to the island were initially unrestrained in their hunting effort as they were free of the English traditions which favored the exclusive use of wildlife by propertied sport hunters. Wildlife was viewed as a free-for-the taking resource (Montevecchi and Tuck, 1987) and game laws were regarded as laws made to be broken. "An Act for the Protection of the Breeding of Wildfowl in this Colony" was passed in 1859 and the rights of 'poor settlers' to take wildlife resources for consumption was still recognized (Montevecchi and Tuck, 1987). During the introduction of additional wildlife legislation in the late 1800's, 'poor settlers' were not mentioned specifically (Overton, 1980). The hunting of caribou for subsistence by residents was gradually eroded by legislation passed in 1859, 1879 and 1889, which limited the number and method of harvest. This resulted in an increase in poaching (Montevecchi and Tuck, 1987). As Overton (1980) notes, "...The class bias of the game laws is clear in the way they were designed to curtail the use of caribou for food in the interest of the developing tourist industry, ..."

By the late 1890's, Newfoundland's "great outdoors" had become part of the tourist industry (McGrath, 1994) and the Reid Newfoundland Railway Company became a big booster of outdoor tourist industry producing some of the first tourist promotional literature. In fact during the introduction of the Game Board Bill, it was stressed that the colony's wildlife needed protection since it was a valuable economic asset that could help increase tourist traffic.

By the twentieth century, the stage had been set for conflict over wildlife resources. This conflict pitted settlers involved in a subsistence lifestyle against sportsmen and government supported capitalists involved in the tourist industry (McGrath, 1994). The observations being made in the House of Assembly by 1910 took on a similar flavor:

> "The fact is that the sportsmen are jealous of the fishermen...they (fishermen) ...kill many more than is allowed by law, and they have as much right to the deer as the outside sportsman who comes here and kills for mere pleasure." (McGrath, 1994).

By the late 1930's, the use of game as a food item in the traditional economy was not tolerated by government. For example, Horwood (1986) shows that the Newfoundland Rangers pressed many charges for poaching during the 1940's.

The perception of unequal treatment of residents and non-residents in the wildlife regulations has persisted. The reaction to a proposal for the expansion of non-resident sport hunting was unpopular in early 1980's. And in 1983, as the government was attempting to introduce the Bay du Nord Wilderness Reserve under the Wilderness and Ecological Reserves Act (1983), they were met with accusations of double standard of treatment between residents and 'elite' (Evening Telegram, 1983) as the residents feared restrictions on traditional access and use rights. Time was never allowed to assuage this fear. In 1985, Lee Wulff, a renowned outdoorsman brought in by the government to promote the great Newfoundland outdoors to prospective non-resident anglers, claimed that salmon would be better protected if Newfoundland rivers were privatized. This

argument is based on the "tragedy of the commons" viewpoint; however, this position has been widely critiqued (Marchak, 1987; McCay and Acheson, 1987). By 1987, government issued a draft policy paper: "Discussion Paper on Commercial Hunting and Fishing Camps in the Province of Newfoundland.", with the objective of finding a balance between protecting the economic viability of the outfitting industry and meeting the resident demand for wildlife resources (Earle, 1987). This too created great media heat and public outcry (See 2-3). Three years later, a different piece of legislation dealing with Crown land sparked a renewal of the outcry as Bill 53, "An Act to Revise and Consolidate the Law Respecting Crown Lands, Public Lands, and Lands of the Province" was castigated by the press as the Outfitters Bill (See Table 2 - 3). It was later abandoned.

Table 2 - 3: Articles and Editorials on the Bill 53 controversy published in the Evening Telegram. (Source: The Evening Telegram, 1990, 1993)

"Proposed bill threatens public access to ponds, rivers." January 26, 1990.
"Protecting Public Waters." January 27, 1990.
"Enclosing the commons." January 29, 1990.
"Bill 53 a threat to outdoors access." February 3, 1990.
"Kill the clause!: February 10, 1990.
"Outdoors freedoms are under attack." by Bill Power, February 16, 1990.
"No need to hold public hearing on new Lands Act." February 18, 1990.
"Opposition leader rips into 'Outfitter's Bill'." February 18, 1990.
"Public access, a Newfoundlander's right: More opposition to Lands Act changes." February 21, 1990.
"Residents oppose the new Lands Act." March 12, 1990.
"Bill C-53: kill it or let the people decide it's fate." February 21, 1993.
"Province may lease Indian Bay waters." September, 1993.
Patrick's Pen by Patrick O'Flaherty. October, 1993

The economic benefits of outdoor adventure tourism continued to be promoted by various agencies (Hamilton and Seyfrit, 1994). The 1990's saw a concerted effort to generate policy to facilitate economic returns from wildlife resources. In 1991, the Economic Recovery Commission (ERC) released "A Proposal to Commercialize the Atlantic Salmon Fishery in Newfoundland and Labrador" suggesting that salmon rivers be leased to outfitters. This was followed up in 1992, when the ERC presented "A Community-Based Salmon Sports Fishery: A Proposal to Localize Control and Economic Impact of the Atlantic Salmon Sports Fishery" which recommended that salmon pools be designated for the exclusive use of outfitters. In 1993, Provincial government departments prepared an adventure tourism discussion paper which stated that the attitude of residents toward land ownership and development regulations was one of the most significant hurdles to implementing integrated resource planning. The paper concluded that information, education, and communication was necessary. It concluded that:

> "Local residents are sometimes resentful of adventure tourism businesses and environmental regulations that affect their access to the natural resources. The public has to be informed of the economic benefits of adventure tourism and understand the importance of environmental management."

In 1994, the tensions again arose over the fact that tourists on tour boats were allowed to jig a cod fish while licensed fishers affected by the cod moratorium were not (Evening Telegram, 1994).

In March of 1994, government policy makers held a strategic planning workshop in Gander with recreational fishing stakeholders who were invited to discuss the strengths

and weaknesses of the recreational fishery (Buchanan, 1994). The fundamental issues for discussion were the recognition of the perception of the right of "equal access" for all Newfoundlanders, Labradorians, Canadian, and visitors alike, and the reality that "equal access' does not necessarily mean free or uncontrolled access. The Buchanan report stated clearly:

> "Change in attitudes must occur if we are to have quality angling for both the resident and nonresident angler. High quality of the angling experience is the key to ensuring that the province will capture sustainable economic benefits from the resource.....local anglers will have to compromise in their use of quality fishing waters if economic benefits are to be realized from a nonresident fishery." (Buchanan, 1994).

Again, in 1995, the provincial government proceeded to privatize provincial parks which created another public outcry. In the meantime, other research initiatives explored the question of the value of access to the countryside. Felt and Sinclair (1995) while doing research on the Northern Peninsula found that two of the three factors people liked most about living on the Northern Peninsula were freedom and outdoor activities nearby. A 1997 survey of salmon anglers on the Humber River found that 87 per cent of resident anglers were against controlling access, while 68 per cent of non-resident anglers surveyed favored controlling access as a way to enhance the angling experience (Van Zyll, pers. com., 1998).

The Gander River Management Association requested and received permission to launch a river specific salmon licence as a 2-year pilot project for the Gander River. This was a special additional licence that salmon fishers would have to purchase over and

above the standard provincial licence that, in the past, would have let them fish the Gander River as well as any other salmon river across the province (subject to the annual Anglers Guide regulations). This announcement set off another public outcry where the issue 'privatization' became the focus of public concern (see Table 2 - 4). But did the outcry in the media truly represent the values and beliefs of the public as a whole?

It is evident from this historical overview that, since the turn of the century, the issue of 'traditional' access to land and resources continues to be a subject of public controversy. This 'traditional attitude' of access to lands and resources has been a

Table 2 - 4: Sample of Outdoor Rights articles published in The Evening Telegram. (Source: The Evening Telegram, 1998)

April 4, 1998	Community river management versus equal access
April 9, 1998	Privatization of the Gander River
April 23, 1998	Laying the ground work: CORA outlines plans aimed at preserving access to outdoors
May 20 1998	The necessity of an Outdoor bill of Rights
May 25, 1998	Another way of privatizing rivers
May 27, 1998	CORA (Citizens Outdoor Rights Alliance) presents concern to ministers
June 10, 1998	Threats upset tourism minister
June 10, 1998	SAEN's silence
June 1998	River talk is 'fear mongering'
Undated	Common Good (letter to editor)

fundamental issue for managers responsible for the wide range of resources, such as, parks and wilderness protection, commercial hunting and fishing, adventure tourism, and Crown land allocation policy. This issue of a traditional access attitude sets the cultural context for this research.

2.4 The Thesis Study Area: Indian Bay watershed.

Located about 50 kilometres northeast of Gambo, the Indian Bay watershed, is well known to Newfoundland anglers (see Figure One) for producing some of the largest eastern brook trout in Newfoundland (O'Brien, 1992). The Indian Bay watershed drains an approximate area of 700 square kilometers and includes some of the largest and deepest interconnected lakes in a single system in insular Newfoundland (H. Khan, pers. com., 1997). A major portion of the forest in the watershed was harvested in the 1920's which left a legacy of interconnected woods roads. Therefore the watershed reasonably accessible by automobile and, more importantly, by ATV and snowmobile. There are approximately 200 remote cabins registered in the watershed (Earle, per. com., 1997).

The only historical research conducted in the area consists of a local recreational activity survey undertaken by the local Development Associations during the summer of 1992. It was an on-site intercept survey administered by Social Services clientele. Of the 886 questionnaires returned to the Indian Bay Information Centre, 67% were completed by local people, 22% were filled out by eastern region visitors, and 10% were by out-of-Province visitors. The chief activities were trout fishing (58%) and camping (24.7%). Only 7.6% went salmon fishing and 6.1% went big game hunting. On average, only 2.2 days were spent in the watershed itself, although non-local respondents spent 14 days in the region. This is explained by the fact that 87% had family and friends in the area. Of the 80% who bought supplies in the area, the estimated value of $50,600 translates to $72 per respondent. Of the details filled out by the fishermen, it is worthy to note that, on


Figure One : Thesis Study Area
Communities Represented in Survey
Boundaries of Indian Bay Watershed
Musgrave Harbour
Lumsden
Indian Bay Watershed
Newtown
Templemann
Pound Cove
Wesleyville
Brookfield
Badgers Quay / Valleyfield
Pool's Island
Greenspond
Indian Bay
Centerville/Wareham
Trinity
Gander
Trans Canada Highway
Dover
Hare Bay
Gambo
N
W
E
S
SCALE 1 : 570,000

average, these fishermen have fished in the Indian Bay area for almost 17 years, and of these long-time anglers, 98% were of the opinion that the trout stocks have decreased: 38% say the decrease is between 26-50%, and 39% say it is between 51-75%.

The study area for this thesis was defined by natural boundaries of the watershed itself and the geographic location of the closest neighbouring communities which made up the Indian Bay Ecosystem Corporation. These included: Gambo , Hare Bay, Dover, Centreville-Wareham-Trinity, Indian Bay, Greenspond, Badger's Quay, Valleyfield, Pool's Island, Wesleyville, Newtown, Pound Cove, Templemann, Brookfield, Lumsden, and Musgrave Harbour (see Figure One). Overall this area has a high rate of unemployment, however, there are pockets of local entrepreneurship. Most of the residents of the Gambo and Dover area commute to Gander for work as they are located within one hour's drive of Gander, a manageable commuting distance. The Indian Bay area which was traditionally dependent on the forestry industry, both through the large-scale pulp and paper company activities and independent small-scale sawlog operators, now suffers 90% unemployment. Centreville is a relatively new town made up of former residents of Fair Island, Silver Fox Island, Sydney Cove, Bragg's Island and Newport (which used to man the schooners of the Labrador fishery) who were moved in the 1960's period of resettlement. Economic diversification has been the byline in this community for the past 30 years, and this is reflected in the businesses which are located here: two fibreglass building companies (of the eight or nine in the province), a wood molding manufacturing plant, using kiln dried pine from the Eastern Seaboard (A & N

Enterprises) and Indian Bay Frozen Foods selling blueberry and partridgeberry products to international markets. Many of these new firms were established by Newfoundlanders who 'went away' and came back with new skills. Wareham has been recently amalgamated with Centreville and provides home base for Woodpik Enterprises which is involved in lumber related products as well as food products like smoked salmon.

Along with Indian Bay, these communities define the line separating the traditional lumber/logging communities of the south and the predominantly fishing dependent communities of the Cape Freels area. The fish plants traditionally processed a wide variety of species, today they rely predominantly on the crab fishery. North of Pool's Island there is a strong lobster fishery. Greenspond was once the capital of Bonavista Bay in the early 1900's. It housed the court house for the region and was the main sailing point for the Labrador fishery. Even as recently as the 1950's-60's, boats of Norway and Germany came into harbour. Needless to say, all the fishing communities felt the impact of the Northern cod moratorium of 1992 and the additional moratoria and quota reductions on a range of ground fish species. The rate of unemployment is high, and the population has declined. Overall, the two regions have an average unemployment rate of 47 % which ranges from 25% in Gambo to 61% in Indian Bay (Census of Canada, 1996). Therefore, as the traditional sources of employment in the commercial forestry and fishing have disappeared, the communities have looked at the recreational fishing resource as a one possible source of diversified economic development.

The Indian Bay Ecosystem Corporation (IBEC) was incorporated in 1995. There were a variety of significant players involved in accomplishing this ranging from community leaders and volunteers, the Economic Recovery Commission, businessmen, academics, scientists, federal and provincial government planners and biologists. The goal was for IBEC to develop a community-based management approach for the watershed. In 1996, amendments to the federal Fisheries Act indicated a movement towards community management of rivers and fish which was expected to act as "...the cornerstone for development of a new relationship between DFO and fisheries stakeholders ..." (DFO, 1996). This would allow communities adjacent to the resource to have greater participation in management, including decision making on issues of access, bag limits, gear type, season, etc., Traditionally these decisions were made by the federal Department of Fisheries and Oceans (DFO), with some involvement by the provincial government and stakeholders.

Under this new direction, the IBEC's watershed management proposal was the first community-based recreational fishery management project to receive official Pilot Project status from the provincial Government of Newfoundland and Labrador in 1996. This was an important step for the subsequent negotiation of a Memorandum of Understanding (MOU) between the Federal and Provincial governments which allowed for the delegation of a number of federal management authorities for recreational fish management to IBEC as a pilot project with a fixed time limit (five years). This MOU was achieved in the fall of 1996. The Corporation now had the authority to put in place

the management policies stated in their management strategy to protect and enhance the trout fishery resource and the watershed, but equally important, to generate economic wealth for the local area by developing Indian Bay as a recreational fishing destination for out-of-province anglers.

Originally, the emphasis of IBEC's work was on habitat restoration and fish stock (Eastern brook trout) rehabilitation. The results showed that with strict management which included a moratorium on fishing on three of the largest ponds in the watershed, the stocks had the potential to return to their historic trophy size and legendary abundance. Initially, the moratorium approach was applied to select ponds as an extreme management technique simply to save the resource. IBEC recognized that the pond closure policy could not remain in place indefinitely. Yet, IBEC was concerned that the free and open access traditionally enjoyed by those who fished the Indian Bay waters resulted in the over fishing that depleted the resource almost to the point of no return. The recreational fish management plan and land use strategy had to address the question of how to meet local fishing demand, which reflects local recreational angling and rural lifestyle objectives, and conservation of the recreational fish resource. They also needed to incorporate a third management objective to design a management strategy to produce the type of recreational angling experience that would attract the non-resident angler. What limits on traditional fishing 'rights' would local anglers be willing to comply with?

To attract the non-resident angler, IBEC needed to implement management measures to guarantee delivery of the type of experience that would attract these anglers

to Newfoundland. IBEC considered management options such as, setting limits on fishing season, size, retention, or even the possibility of charging for a licence to fish in special areas. Until now, there had been no intensive management of the recreational fishery anywhere in Newfoundland. DFO only set the fishing seasons, daily bag limits and some gear conditions for broad zones across the province.

The IBEC had to consider the implications of additional regulations for the watershed. They also had to find ways to fund the enforcement effort that would be needed to ensure compliance with these new and different requirements. One of the key reasons for encouraging community-based management was to facilitate voluntary compliance with regulations and local 'policing' of a common resource. However, if there was no acceptance of the rationale for the regulations and support for the objective of securing the nonresident angling market for the purpose of injecting new 'outside' dollars into the local economy, the project would not succeed.

Yet before they went ahead, IBEC needed some way to predict the outcome of the range of management choices they had to make within the time period of the pilot project. IBEC had to assess whether the neighbouring communities would voluntarily support the management decisions. To evaluate public reaction, IBEC needed to identify those direct and indirect values and activities associated with the resources in the watershed that could somehow be compromised, or perceived as being compromised, by changes in the management of the watershed. There was no information on the beliefs and attitudes of local resident's and users of the watershed towards existing regulations and activities in

the Indian Bay watershed. IBEC had no information to assist in anticipating reaction to proposed management changes. Without a frame of reference, the IBEC had no guidance to develop educational messages which would help them achieve the level of public awareness and support they needed.

3.0 Theory

3.1 Introduction

The theoretical basis for this thesis is outlined in the following two sections. Section 3.2 provides the background of the cultural paradigms approach to describe pre-existing cultural models which influence how new information is processed. Section 3.3 outlines the Theory of Reasoned Action developed by Martin Fishbein and Isaac Ajzen (1967, 1975, 1981).

In the 1950's Hovland's research focussed on learning principles assuming that attitude change involved learning a new response to a given stimulus: the attitude object (Manfredo, 1982.). Research was done within a conceptual framework that incorporated context variables (source, message, channel, and receiver factors, target variables, immediate attitude change, retention, behaviour change), and mediating processes (attention, comprehension, and acceptance). However, this 1950's and 1960's research on contextual factors which showed weak attitude-behavior relationships was largely a failure. This resulted in a controversy about validity of the attitude concept with a central concern in particular over whether or not attitudes influence behavior (Manfredo, *et al.*, 1992).

The value of attitude research was further challenged by the fact that people often harm the environment despite holding attitudes that are environmentally friendly (Thompson *et al.*, 1997). Moreover, environmental disputes are often difficult to resolve because they involve scarce resources and touch on people's core ideological beliefs

(Thompson and Gonzalez, 1997). In an effort to address the issue of inconsistency between people's attitudes and their behavior, researchers felt that further investigation should focus on finding a way to measure people's fundamental attitudes and values, rather than more volatile and superficial perceptions of specific problems (Van Liere and Dunlap, 1980; Kuhn and Jackson, 1988; Kempton, 1995).

In 1967, Fishbein, noted the prevailing understanding of an attitude, stemming from research in the 1930's and 40's, was a tendency to act toward or against something in the environment which becomes thereby a positive or negative value. Attitude surveys were, and still are, often used simply to obtain the answer to a specific question and find out how common a particular attitude might be in a certain population. There was no link to behavioural intention or decision making. Therefore the results were of limited value to managers who are interested in understanding how respondents would act or react to new initiatives. In contrast, the Theory of Reasoned Action describes the structural relationship between beliefs, attitudes, and behavioural intention. This theory has its grounding in social learning and attitude theory. The Theory of Reasoned Action provides the theoretical basis for designing the statements used in the survey instrument to explore the salient beliefs and attitudes which might influence decisions by local people about the use and development of the Indian Bay watershed.

3.2 Cultural Paradigm Theory

Research into social values and wildlife has a broader context than simply application in wildlife management. A fairly extensive list has been produced of the

kinds of personal satisfaction that comes from engagement with wildlife, including recreational fishing (Spaulding 1970; Knopf *et al.*, 1973; Driver and Knopf 1976; Kennedy and Brown, 1976; Driver and Cooksey 1978 and Manfredo *et al.*, 1980, 1984). There has also been research into the influence of the social or cultural context on participants, such as the effect of socialization on participation in hunting and fishing activities, and research regarding cultural values (Kellert, 1980). Many authors transform value statements into statements of preference. Decker, *et al.* (1987) summarized the primary foci of past studies of human dimensions in wildlife research as "...attempts to:

1 understand human attitudes and beliefs about wildlife;
2 qualify human preferences for wildlife and wildlife-related phenomena;
3 qualify in economic and non economic terms, the value humans assign to various uses of wildlife;
4 understand human behaviour related to wildlife;
5 relate human wildlife-related preferences and behaviour to wildfire management issues."

The contribution of wildlife to society has been related to a sense of historical tradition and cultural ties or even to engaging the human capacities for intellectual growth and a sense of spiritual meaning (Leopold, 1968) Yet Kellert (1996) asserts that the public remains sceptical and unconvinced of such broad valuation. Recent studies revealed a degree of appreciation of wildlife among the general public, but it is typically narrow in its emotional and intellectual focus and largely directed at a small component of the animal community, such as large carnivores or endangered species (Kellert, 1980). However, the literature continues to explore whether the cultural framework shapes the

issues people see as important and affects the way they act (Kempton, 1995). For the Indian Bay watershed, the question remains: what is the local cultural framework, what combination of values makes up this framework, and how might a change in the beliefs and attitudes associated with these values initiate change in this cultural framework?

The literature on the development of environmental concern provides a theoretical approach which looks at the social or cultural basis of attitude development. Theoretical research pointed out that social paradigms condition individual goals and expectations and provided a definition of social problems. Paradigms established a structure of social and metaphysical rewards for various types of preferred behaviour, and created shared gains and deprivations that make social harmony in complex societies possible. Paradigms are made up of beliefs about what the world is like, thereby providing a guide to action, but they also serve the purpose of legitimizing or justifying courses of actions. They function as ideologies (Milbraith, 1985). Swan in 1971 argued that "...at the root of the ecological crises are the basic values which have built our society." Albrecht *et al.* (1982), concluded that a major theme in the literature on environmental problems in the United States was that such problems stemmed from American society's traditional values, beliefs, and ideologies.

These were characterized as the 'Dominant Social Paradigm (DSP)'. In summary, the DSP consisted of: (1) a belief in limitless resources, continuous progress and the necessity of growth; (2) a faith in the problem-solving abilities of science and technology; and, (3) a strong emotional commitment to a laissez-faire economy and to the

sanctity of private property rights. Furthermore, research conducted by Albrecht *et al.*, 1982 substantiated the claim that DSP posed barriers to the development of a strong pro-environmental orientation.

However, Dunlap and Scarce (Bazerman, 1997) conducted an extensive survey which concluded that there was an increase in environmentalism among the U.S. public and speculated that environmentalism represented a new paradigm. Dunlap and Van Liere (1978) constructed a survey instrument to measure the beliefs comprised in this new paradigm. They argued that in the seventies, Americans were in the process of developing a "New Environmental Paradigm," (NEP) including such beliefs as the frailness of nature, natural limits to growth, need for environmental protection, and desirability of a steady-state economy (Milbraith, 1984). As described by Albrecht *et al.* (1982) the NEP scale was designed to measure the extent to which persons accept premises of the NEP paradigm as compared to those of the DSP. Research applying the NEP would empirically examine the linkage between commitment to the DSP and concern for protecting environmental quality. Kempton (1995) stated that over the past thirty years there have been significant environmental changes and that environmental beliefs and values of human cultures are also rapidly evolving. In this research project, it is proposed to explore and describe the cultural paradigm for the Indian Bay communities through an analysis of the valuation of traditional values of open and free access (to the land and resources of the watershed for personal use), with development and management values.

Van Liere and Dunlap (1978) developed attitudinal paradigms incorporating a set of internally consistent attitude statements to construct a profile of individual's environmental orientation. Commitment to either the DSP or NEP depends on the acceptance or rejection of a number of attitudes, values, and beliefs, Hence, a series of statements that represent the key aspects of each paradigm can be formulated and then used to measure an individual's adherence to either the DSP or NEP (Kuhn and Jackson, 1988). Results suggest modest support for the hypothesis as higher correlations among environmental attitudes and behavior occur for groups who have a greater integration of important social and environmental beliefs (Van Liere and. Dunlap, 1978). This cognitive integration refers to the extent to which beliefs that are intrinsically related are held in isolation (Rokeach, 1968). Individuals often hold beliefs that are inconsistent. A basic premise of cognitive consistency theory is that individuals will feel pressure to reduce these inconsistencies (or 'dissonance') if they become aware of them (Albrecht, 1982). Individuals integrating their DSP and NEP beliefs should experience cognitive reorganization in the direction of accepting or rejecting either the DSP or NEP.

People do not passively receive environmental news, but rather, they actively interpret what they hear via their preexisting cultural models. Milton (1996) observed that starting in the late 1960's through to the 1980's, anthropologists were asking how the observable patterns of social organization were generated, and how people's actions changed their understanding of their own society and generated new norms. Milton maintained that culture is sustained and modified through social interaction in which

individuals act on the basis of their own knowledge of their own cultural understandings. Some researchers have suggested it might be more appropriate to view the person-environment relationship as necessarily specific to a particular historical and geographic context (Kuhn and Jackson, 1988). The NEP scale would also be a useful technique for charting change over time or investigating geographic variations for the NEP variables.

Kempton (1995) recommended that anyone trying to communicate with the public about global environmental change needed first to address the pre-existing models and concepts rather than assume they are writing on a blank slate. A generalized media message stating that the recreational sport fishing is important to the local economy might not make any difference to the angler who traditionally fished to the maximum daily bag limit. Recent work on risk communication has shown that notably better results are achieved when communications are designed on the basis of cultural models research on how people understand the subject of the communication. For example, if the message was linked into the angler's values regarding trout in the Indian Bay watershed, there would be a higher likelihood of achieving cooperation on proposed management measures intended to promote development of the recreational sport fishery.

For the purposes of this research, the attitudinal questions were designed to fit into the general frame of the NEP as proposed by Van Liere and Dunlap (see Table 3-1). The research would provide an indication of the community's position on the paradigm scale between DSP and NEP. Eagley and Kulsea (1997) describe four other studies that concluded with a similar categorization of attitudes as defined by Van Liere and Dunlap

Author	**TABLE 3 - 1: Generalized Cultural Value Systems:** The theory of cognitive consistency is based on the assumption that people try to strike a balance between these three broad categories of values.		
	Individual-oriented	**Humanity-oriented**	**Whole earth/ecosystem oriented**
Stern, 1993	**Egoistic** Commitment to maximize personal well-being and one's own outcomes	**Altruistic** Concern for costs and benefits that accrue to others rather than oneself	**Biospheric** Costs and benefits are viewed in relation to the ecosystem or biosphere as a whole
Axelrod, 1994*	*Economic value* Economic security, material rewards & avoidance of costs	*Social value* referring to the consequences t hat one's actions have for others	*Universal value referring to contributions to the betterment of the world in general*
Merchant, 1992*	**Egocentric** Maximization of self-interest	**Homocentric** Maximization of outcomes for the greatest number of people	**Ecocentric** Referring to the stability, diversity & harmony of the ecosystem
Kellert, 1978	*Doministic hunter*	*Utilitarian hunter*	*Nature hunter*
Van Liere and Dunlap, 1978 **New Ecological Paradigm**	**'Humanity over Nature"** - Mankind was created to rule over the rest of nature. - Humans have the right to modify the natural environment to suit their needs. - Plants and animals exist primarily to be used by humans. - Humans need not adapt to the environment because they can remake it to suit their needs.	**"Limits to Growth"** - We are approaching the limit to the number of people that the earth can support. - The earth is like a spaceship with only limited room and resources. - There are limits to growth beyond which our industrialized society cannot expand. - To maintain a healthy economy we will have to develop a "steady state" economy where industrial growth is controlled	**"Balance of Nature"** - The balance of nature is very delicate and easily upset. - When humans interfere with nature it often produced disastrous consequences. - Humans must live in harmony with nature in order to survive. - Mankind is severely abusing the environment.

* in Eagly and Kulsea in Bazerman et al., 1997

(1985). In an examination of hunter values and attitudes, Kellert, in 1978 (Eagly and Kulsea, 1997) concluded that there were three types of hunters: doministic, utilitarian and nature-oriented. In 1992, Merchant (Eagly and Kulsea, 1997) examined environmental ethics and defined motivations for behavior as egocentric, homocentric and ecocentric. In 1994, Axelrod (Eagly and Kulsea, 1997), who was researching a parallel classification of values relevant to environmental attitudes, classified social values as economic, social or universal. And finally, Stern (Eagly and Kulsea, 1997), after examining values associated with a general attitude they termed 'environmental concern', characterized behavioral motivation on the basis of egoistic, altruistic and biospheric. Table 3 - 1 summarizes the grouping of attitudes or scale of attitudes that were considered to have internal consistency (refer to methodology in Chapter 4).

The New Environmental Paradigm attitudinal scales were used to categorize the belief system characteristic of the communities adjacent to the Indian Bay watershed. The resulting attitudinal scale would describe the pre-existing social or cultural model that the Indian Bay respondents apply when processing new information. Therefore, this attitudinal model represents an important influence on local behavior regarding use of the land and resources of the watershed.

3.3 The Theory of Reasoned Action

3.3.1 Social learning and attitude theory foundations

Hovland in the 1950s developed a message-learning approach, and according to this traditional approach, the fundamental process in attitude and behaviour change are

attention, comprehension, yielding and retention. Later, MacGuire (1968) added two additional steps to persuasion process, retention of the advocated position and actions that are consistent with the advocated position. This served as a foundation for the development of social learning theory, as described by Bandura (1977) which provides a framework for explaining how people form the values, beliefs, and attitudes that lead to decisions to behave in particular ways. In essence, social learning theory states that people learn their goals, values, attitudes, and so on, by doing and watching others and through verbal and written communication. Social learning theory is both behavioristic in that it emphasized the consequences of behavior, and cognitive as it considers that people interpret past events to set goals for themselves (Bandura, 1988, 1989). From this groundwork, attitude theory, the Theory of Reasoned Action and related persuasive communication theory were premised on viewing the individual as a rational decision-maker, that is, the individual actively processes information, or 'the message', in a systematic manner when forming beliefs/attitudes that ultimately influence their behavioral intention.

This premise went a long way in addressing the inconsistencies in attitude-behavior observations repeatedly demonstrated in the attitude research of the 1940's to 60's (Himmelfarb and Eagly, 1974). In 1980, Fishbein and Ajzen felt that the problem of the inconsistencies in attitude-behaviour research lay in methodology. They noted that inconsistencies in traditional attitude research was due to two facts: a poor definition, and therefore poor understanding, of 'attitude', and the habit of simply ignoring the content

of the 'message'. In fact, given the traditional all inclusive definition of attitude where the term was used to refer to affective feelings (affect) toward some object and also their cognition (or beliefs) and conations (behavioral tendencies), investigators felt free to select the dependent measures in an arbitrary manner as long as it appeared to be related to the issue under consideration (Fishbein and Ajzen, 1975; Petty 1981). This resulted in inconsistent and contradictory research findings. Therefore, the clarification of the components of attitude provided by Fishbein and Ajzen in the Theory of Reasoned Action (see Table 3-2) helped to redirected emphasis in the research on the content of the message and also draw attention to the need to direct the information (or message) at a

Table 3 - 2: Components of Attitude Structure

	Response category (Ajzen, 1988).		
	Cognition	Affect	Conation
Responses used to infer attitudes	Expressions of beliefs about attitude object*	Expressions of feelings toward attitude object	Expressions of behavioural intentions
Example questions from Indian Bay survey	People should be able to go anywhere in the Indian Bay watershed.	Some ponds in the watershed should be kept as remote (very difficult to access) areas.	I would be able to drive a vehicle anywhere I want in the Indian Bay watershed.

target, that is, the appropriate belief (or set of beliefs) and attitudes in order to influence behavior. They also examined the influence that the message structure and content have on the effectiveness of persuasive communication.

3.3.2 The Theory of Reasoned Action

Ajzen (1988) defined attitudes as learned predispositions to respond to an object or class of objects in a consistently favourable or unfavourable way. This definition is still used in current research as an attitude was defined as a disposition to respond favorably or unfavorably to an object, person, institution, or event (Eagly and Chaiken, 1993). Ajzen distinguished beliefs as the hypotheses concerning the nature of the object and its relationship to other objects. Thus, if an individual evaluates information and believes that particular information is associated with an object, this belief forms the basis for the reaction (attitude) to the object, which can ultimately lead to specific behaviour in relation to the object. However, this relationship is not a single item, cause and effect situation. Rather, an individual can learn many different things about an object, and it is only those beliefs which are salient to the behaviour that come together to affect an attitude that is brought to bear in a behavioural situation. This sum of the beliefs, described as a summated evaluative response by Fishbein (1967), becomes associated with the object. Thus, when the object is presented, it elicits this summated evaluative response, that is, it will elicit this learned attitude. This is known as the "belief system" (Fishbein, 1967).

Furthermore, Eagly and Kulesa (1997) also examined the concept of attitude structure where they claim to imply relationships between attitudes which they refer to as molar structures that encompass more than one attitude. These attitudes become linked to one another when one attitude implies another attitude psychologically, and sometimes

logical analyses forges relationships between attitudes. Determining the salient beliefs to incorporate in the belief system and attitude structure is of fundamental importance to the construction of an attitude (See Chapter 4). Ideally it would consist of the selection of a small number of representative and valid items which demonstrate statistical internal consistency. Fishbein and Ajzen (1981) assert that only in the aggregate can responses to an attitude scale be said to assess the general behavioral disposition of interest.

Fishbein and Manfredo (1982), summarize the Theory of Reasoned Action as primarily concerned with identifying the factors underlying the formation and change of intentions. However, the relative importance of attitudes and subjective norms could vary among individuals. It views behaviour change as being a matter of changing the cognitive structure underlying that behaviour. The key to developing a successful intervention is through identifying and examining the cognitive structure of beliefs, evaluations and motivations underlying specific attitudes. Eagly and Kulesa (1997) stated that communications directed to the general public are important, not only because they may influence public opinion and therefore have an impact on public policy, but also because they are potentially persuasive in inducing behaviour. They concluded that in order to design an effective persuasive appeal, it is important to understand attitude structure, especially the link between attitudes and important social values. In addition, the mode of effective persuasion needs to be considered in order to understand the conditions under which changed attitudes would promote the desired behaviour.

Fishbein and Ajzen (Petty, 1981) state that information is the essence of the persuasion process, however, they found that message content had been largely overlooked in communications theory. Persuasive communication is the only communication strategy that appeals to reason (Ajzen in Manfredo, 1982). Based on the Theory of Reasoned Action, a message can be designed to influence different kinds of target variables, such as beliefs, attitude, and behavioural intention. The effectiveness of a persuasive communication depends on the extent to which it influences the determinants of the target variable selected by the investigator. Therefore, this thesis will be focussed on exploring what might be the determinants of the different target variables, each denoting a type of access to land and resources in the Indian Bay watershed. Persuasive messages that aim to change behaviour should target attitudes toward behaviour, and change in these attitudes requires change in the perceived consequence of behaviour (Ajzen and Fishbein, 1980; 1981; Eagly and Chaiken, 1993).

Motivation to process the message has been determined to be significantly influenced by the level of the receiver's involvement with the target of the message. The message may create involvement by dealing with receiver's enduring values (Ajzen 1988), such as the traditional right of access, or with receiver's ability to obtain desirable outcomes or avoid undesirable outcomes, such as, unlimited or unregulated fishing will deplete the trout stock. Therefore, this research also attempted to define the factual basis and underlying belief structure that influenced key attitudes supporting or hindering the objectives of IBEC.

4. Methodology

4.1 Introduction

The primary reason for using a survey approach is that there is no other source of information which addresses the fundamental research question. As Sheskin (1985) aptly stated "...when such 'features' include the behavioural characteristics of human subjects, survey research becomes a primary data collection tool.". The main reasons for using a mail survey for this thesis were that mail surveys are simple and cost effective (Lowery, 1978; Harris and Bergersen, 1985; Williams *et al.*, 1986; Pollock *et al.*, 1994). The application of the questionnaire was undertaken using a modified version of the approach outlined by Fowler (1988) for this type of research.

4.2 Refining the Research Question

The research question emerges from a combination of the historic conflict in wildlife management objectives in Newfoundland, which remains unresolved, and the current management needs and goals of the Indian Bay Ecosystem Corporation. The literature on society and wildlife suggests looking at the broader context of cultural values. Yet, the growing body of literature on human dimensions in resource management potentially offers more specific insights through research into the behavioural antecedents (beliefs, attitudes, and behavioural intentions) of direct action. To ensure that the key questions are relevant to the IBEC, two steps were followed in focussing the research question: (1) meetings with the stakeholder groups, including review of government

agency responses to the IBEC proposal; and, (2) a workshop with key participants involved in the IBEC project.

Bright *et al.*, (1993) summarized this pre-questionnaire process whereby the content of a message should be developed by eliciting the beliefs regarding the outcomes to implementing such a policy which are most salient to the public. This may be done by using an elicitation study (Ajzen and Fishbein, 1980), that is, asking about the important positive and negative outcomes of implementing a particular management policy. Interviews were conducted with the key agencies involved with the Indian Bay recreational fish management project. They were asked for their general perceptions about the proposed management approach and what information would be most useful and appropriate to gather through a survey. This was done to ensure that salient attitude and belief statements would be included in the survey. Their answers are summarized in Appendix One. In summary, the resulting comments focussed on the issues surrounding delegation of management and enforcement authority, the public reaction to changes in access and resource use regulations, the potential to realize economic benefits as projected by IBEC, and the viability of the recreational fishing resource to sustain the various demands on it. As a next step, a workshop was held to build on the comments gathered during the previous interview process in order to further refine the areas of focus for survey research.

The workshop had invited representation of key interest groups directly involved in the development of the Indian Bay project. The main concern with this approach was

the Hawthorne effect whereby the participants might be conscious of their participation and might therefore modify their reactions and participation accordingly (Spector, 1981). During the two day workshop, presentations were given on previous research methods applied in recreational fish management prior to the focus group discussion in order to give a broader context for discussion.

Table 4 - 1 lists the participants who brain-stormed various issues relevant to the IBEC proposal, and then worked together to merge these ideas into subject groupings which were then priorized. Table 4 - 2 lists the groups of issues discussed, and the results of the vote for inclusion in the proposed survey research. Based on the ranking of priority issues by the workshop attendees, it was apparent that the key areas of research were regarding attitudes towards development and access, and public acceptance of management proposals for the watershed.

Based on the research and consultations, it was hypothesized that the key influence on these attitudes and acceptance was the 'traditional' open access attitude of rural Newfoundlanders. It was further hypothesized that this attitude was inter-related with attitudes regarding the economic use of these resources and attitudes towards regulations and other management decisions which might involve infringements on this access. Therefore, the thesis question was formulated as a series of questions

- Is the attitude of traditional access still prevalent?
- Is there a cultural value context which supports this attitude?

Table 4 - 1: List of participants in:
(A) Research scoping interviews.

- Alastair Allan, Consultant; and, Mr. Michael Doyle, Senior Policy Analyst.
- Economic Recovery Commission (ERC)
- Mr. Mike Joy, Director. Tourism Division, Government of Newfoundland
- Mr. John Power, Director, Land Management Division. Lands Branch, Government of Newfoundland
- Interdepartmental Land Use Committee, Government of Newfoundland. Internal summary of comments to Indian Bay Management Plan from 16 provincial and federal government agencies.
- Mr. Barry Wicks, Senior Biologist and Project Manager, and the project manager for the IBEC, The Indian Bay Ecosystem Corporation.

(B) Workshop to refine research question

- Mike van Zyll de Jong, Freshwater Fish Biologist, Inland Fish and Wildlife Division, Department of Forest Resources and Agrifoods, Government of Newfoundland and Labrador.
- Rob Perry, Freshwater Fish Biologist, Inland Fish and Wildlife Division, Department of Forest Resources and Agrifoods, Government of Newfoundland and Labrador.
- Dave Vardy, Ecosystem Manager for Gander River pilot project, Department of Development and Rural Renewal, Government of Newfoundland and Labrador.
- Dr. Alistair Bath, Thesis Advisor, Department of Geography, Memorial University of Newfoundland.
- Dr. Wolfgang Haider, Senior Researcher, Ministry of Natural Resources, Government of Ontario.
- Dr. Larry Felt, Department of Psychology, Memorial University of Newfoundland.
- Peter Bull, Graduate Student, Department of Geography, Memorial University of Newfoundland.
- Brent Smith, Graduate Student, Department of Geography, Memorial University of Newfoundland.
- Barry Wicks, Project Manager, Indian Bay Ecosystem Corporation.
- Vince Norris, Field Research Co-ordinator, Indian Bay Ecosystem Corporation.

Table 4 - 2: Workshop to refine research question.

Format:

A core group of ten individuals (listed on Table 4-1) were selected to participate in this two-day workshop. On the first day, presentations were made by the graduate students and the guest researcher providing an overview of recreation angling research and community based development initiatives in Newfoundland, as well as some new directions in human dimensions research for resource management problem-solving. On the second day, the participants were given an overview of the Indian Bay management project. A brainstorming session provided a list of issues which were condensed into eight general areas of concern.

1. How to find appropriate funding to Plan for economic development.

2. What are people's attitudes toward development and access in the Indian Bay watershed?

3. Need to explore knowledge, beliefs and perceptions of local residents towards watershed development options.

4. How to gain acceptance of recreational fisheries management options, particularly those which will involve enforcement of different regulations to enhance economic goals.

5. Economic values: What do local people see in their economic future?

6. Political and Institutional issues: How to develop an integrated decision-making process that incorporates conservation and economic goals. How to achieve cooperation between regional goals versus zonal, or local goals; and, how to ensure political and institutional accountability.

7. Community-based management issues: How to do it?

8. Angler motivations: Why do people fish?

Key issues:

The participants were then asked to priorize the issues by ranking their top three issues. For each category the rankings were totaled. Two key issues were identified:

- The need to understand local attitudes toward development and access; and,
- How to gain acceptance of new management proposals for the watershed and its resources.

- What is the current cultural value context of the local communities involved in the decision-making for the management of the Indian Bay watershed?

- Are there underlying predictive relationships between key attitudes and beliefs that can be targeted by persuasive messages in order to gain acceptance of new management proposals?

Ultimately the goal for the IBEC would be to move the management agenda from the historical conflict forum to one of negotiation, perhaps even cooperation?

The issues with respect to the research question that would be relevant to both anglers and non-anglers within the IBEC area fell into three themes:

- Access: access into the watershed; access to recreational cabin development opportunities; and access to the trout resource;

- Development: general economic development; specific sport fish development options; perceived impacts of development on the angling experience; and,

- Management: condition of the trout resource and who should manage.

It was necessary to frame the hypotheses in the context of the statistical methods chosen to analyse the theoretical framework of the thesis (see Chapter 5). Principal component analysis was used to explore the social values in the local communities following the Cultural Paradigm Theory. For the Theory of Reasoned Action, the Pearson product moment correlational (*r*) analysis and step-wise linear regression were applied to explore attitude/belief structures.

4.3 Question Design

4.3.1 The Attitude and Belief Questions

This was a one-time survey where all measurements were taken at one point in time. The selection of the variables that were to be incorporated into the attitude/belief

questions considered the personal relevance of the issue to the participants, the accessibility of the respondent's attitude when reading the statement, and the salience of the content of the statement to the topic. Noe and Hammitt (1992) observed that, as the personal relevance of information or action increases, individuals are increasingly motivated to evaluate more highly the consequences of an action. Because of this increased evaluational introspection, attitudinal beliefs or opinions may be less directly influential in predicting an outcome. For this reason, the variables derived from the interviews and workshop were translated into questions focussed on activities that were directly relevant to management of the watershed and the interests of the rural populations that would be responding to the questionnaire.

According to Sigler (1990), questions should be briefly worded, straightforward, unambiguous, and deal with only one topic or idea per statement. Sigler (1990) further states that each item should have 'face validity' which clearly contributes to some facet of the overall concept being evaluated.

Another consideration in selecting the statements that might compose an attitude structure is an understanding of the link between environmental attitudes and important social values (Eagly and Kulesa, 1997). This was particularly important in selecting the subjects and developing the statements that would incorporate the environmental attitude in a recreational activity context that is relevant to the respondents. In Bazerman (1997), it was indicated that high accessibility of an attitude is not sufficient to induce a strong attitude-behaviour relation, the attitude must in addition be perceived as relevant to the

behaviour. Since the survey was being applied to both anglers and non-anglers, the questions posed to both these groups included statements regarding access to the watershed and cabin development in general. Both recreational activities have been claimed as a 'traditional right' by the public. The interview and workshop exercises confirmed these issues as main issues relevant to the Indian Bay project. The thesis explores the relationship, if any, of the salient beliefs associated with these key activities, angling, access within the watershed and cabin development, and attitudes towards use of these resources (Ajzen and Fishbein, 1980).

Ajzen's (1988) attitudinal research distinguishes between three categories of responses: cognition, affect, and conation. In this survey, the attitude questions were structured to correspond to these three categories in an effort to build an attitude scale, otherwise referred to by Eagly (1993) as an attitude structure. Responses are aggregated in order to eliminate the influence of unique factors associated with any given time (Ajzen, 1988). The selection of survey questions attempted to follow Azjen's logic whereby the responses to these items in their totality would reveal the respondent's overall attitude. The item total correlation, or internal consistency, is important. Construction of an attitude scale need only involve the selection of a small number of items with internal consistency (Eagly, 1993).

Historically social psychologists have emphasized the properties of directionality and intensity when using scales to measure attitudes, and the Likert technique assists in establishing a hierarchical ordering of the variables. The attitude questions were designed

for the respondents to indicate their level of agreement with a statement on a 7-point Likert scale (strongly disagree had a value of 1 and strongly agree had a value of 7). An odd number scale was used in order to allow respondents to indicate a neutral response (value = 4), otherwise the lack of this option would essentially create an attitude. When using the Likert scale, Petty and Cacioppo (1981) recommended that each statement should clearly express either a positive or negative feeling about the issue under consideration. The presence of an object elicits a generally favourable or unfavourable evaluative reaction which is the attitude toward the object. This attitude, in turn, predisposes cognitive, affective, and conative responses to the object, responses whose evaluative tone is consistent with the overall attitude (Ajzen, 1988). For example,

Statement 1: Tourism is a valuable economic asset to the Indian Bay area.

Statement 2: The recreational trout fishery of Indian Bay watershed could become an important part of the local economy.

Statement 3: We should encourage more people to fish in the Indian Bay watershed.

For this hierarchy, if a respondent indicates a positive attitude towards tourism and holds the belief that recreational fishing is important to the economy, then they would logically support the action stated in Statement 3. Yet, researchers have repeatedly demonstrated, general environmental attitudes such as the popular environmental concern variable are usually only weakly correlated with particular environmentally friendly behaviours (Finger, 1994). Ajzen and Fishbein (1980) state that only when a measure of attitude can first be shown to serve as a determinant of intention does it pay to investigate the beliefs

that underlie the attitude. A given set of beliefs is of explanatory value only if it can be shown to be the determinant of the attitude or subjective norm that underlies the intention, and ultimately the behaviour, under investigation. There is no direct predictive connection between attitudes and subjective norms to behaviour. Therefore, it is imperative to be able to identify an intention that is highly related to the behaviour under examination. More specific attitudes are more predictive of behaviour (Bazerman, 1997).

Another important consideration in the design of the questions, according to the Theory of Reasoned Action, in order to change behaviour, the arguments included in the persuasive message should be statements regarding the consequences of performing the behaviour, not statements about the target of the behaviour (Ajzen and Fishbein, 1980). This principle applies to the development of the attitude questions as well. Eagly and Chaiken (1993) take this theory a step further in their definition of an attitude structure which implies relationships or linkages between attitudes. While three statements might be sufficient to construct an attitude scale, there might be a relationship between attitudes that could allow more than one attitude to be changed if a targeted message affected a fundamental belief underpinning attitude structure. The variables chosen for the Indian Bay survey may show similar consistencies between attitudes which might in turn be useful to explore in the statistical analyses.

There are three themes in the Indian Bay attitude survey stemming from the Management Plan prepared by the Indian Bay Ecosystem Corporation and the discussions at the workshop held to identify the key issues for the survey. These are: access to the

watershed and its resources, development issues related to general values, sport fish development and the impacts of other development (industrial), and the management of resources. The questions are found on Table 5-1 (where they are categorized by theme).

4.3.2 Respondent profile questions

The only questions that provided any specific information about the respondents were those regarding their involvement in recreational activities in the Indian Bay watershed. Schoolmaster *et al.*, (1985) made the observation that, the experience level of an individual has been shown to be related to the specificity with which recreationists defined their expectations for a particular experience. Manfredo, *et al.*, (1992) preferred the rationale that when attitude-behaviour relationships are weak, one explanation could be attitude accessibility, i.e. attitudes might not guide behaviour because they are not accessed or available in memory because they are not part of the individual's immediate experience. Results of attitude-behavioural intention relationship tests show that, at higher levels of experience, there is an improved prediction of intentions to support the policy and attitudes tend to be more extreme.

A limited number of knowledge questions were asked. For questions answered by all respondents, the knowledge questions were phrased as opinions on such items as the condition of the Indian Bay fish stocks, the effect of mining on fish stocks, or the effect of logging on a fishing experience. The answers were indicated on a Likert scale. The only other question answered by all respondents related to the recognition of IBEC. For anglers only, there were additional technical questions about fishing gear, reasons for

fishing (motivations), and specific recreational fish management preferences. This information was expected to be useful to the IBEC.

No socio-economic information was gathered. Although this linkage between user attributes and preferences may appear logical, evidence as to it's reliability and usefulness is inconclusive. Researchers have questioned the use of socio-demographic variables as predictors of recreational participation (Schoolmaster *et al.*, 1985), therefore it was decided not to risk antagonizing the respondent (Sheskin, 1985) with questions on personal information which were not essential to the central questions of the survey.

4.4 Research Design

4.4.1 Whom to survey?

The research question involves the management of public resources and the implications of management decisions on the people who use these resources. Natural resources are to be managed by government in 'trust' for the benefit of all the residents of the province. While the main beneficiaries of the recreational trout resource of the Indian Bay watershed could be said to be the anglers who harvest the fish, nonetheless the resource belongs to a larger public, and the perspectives of that larger group needs to be considered in the development of management policy. Moreover, the information sought will be used in an inferential manner to characterize the response from the Newfoundland public, not only to the Indian Bay proposal in particular, but to other similar proposals elsewhere in the province. Therefore, for this research, the questionnaire was sent to anglers and non-anglers alike, irrespective of membership in any associations,

municipalities or other defined constituency within a specific geographic area surrounding the Indian Bay watershed. According to Gigliotti and Peyton (1993), if agencies are obligated to allocate resources equitably among users, it is important to determine the extent to which the objectives of influential interest groups, such as the IBEC, represent all users of a particular resource before allocation decisions are made. Only the public can answer that question. Therefore, both anglers and non-anglers were included for the sampling frame.

Another concern in deciding on the sampling frame was the element of emotional response on the part of participants. Given the potential for emotion as outlined in Chapter 2, there could be a concern for bias and skewed reaction to the questions in the survey. As noted by Vining (1987), "... it is likely that emotional or passionate advocacy motivates protest and challenge of professional resource management decisions." To counter this concern, the questionnaire was applied during a time when there was no appreciable public profile of any infringement of 'traditional' public access. In fact, the special pilot Gander River licence was issued two months after this survey was conducted. Therefore, these results are indicative of public beliefs and attitudes prior to the 'privatization' controversy (see Chapter 2).

To determine the sampling frame, the selection factors itemized by Sheskin (1985) summarized the approach: cost, time, geography, level of accuracy and sub-group analysis. The most important factor is the quality of the data to be collected. This is measured by the level of accuracy which is the standard in questionnaire research studies.

The standard in the field is a 95% confidence level with a +/- 5% confidence interval level, a goal which requires a minimum of 384 responses to the survey (Sheskin, 1985) The study area for the thesis was the Indian Bay watershed, therefore the sample population was selected from the communities which were in the local area (refer to Figure One in Chapter 2). These communities were selected on the basis that they were the communities which elected the members of the Board of Directors for the Indian Bay Ecosystem Corporation. Therefore, the questionnaire was sent to randomly selected residents in the Indian Bay project area, proportional to population, including: Gambo, Hare Bay, Dover, Centreville-Wareham-Trinity, Indian Bay, Greenspond, Badger's Quay, Valleyfield, Pool's Island, Wesleyville, Newtown, Pound Cove, Templemann, Brookfield, Lumsden, and Musgrave Harbour. At the time of the survey, the population in the area, for 1991, was 13,261 (1991 Census). Subsequent to the application of the survey, the 1996 Census data was released indicating a population of 12,367 which represents a decline of 7%.

In order to obtain addresses of potential participants in the study, a telephone survey was undertaken. A list of telephone numbers, the script, and record forms was prepared by the coordinator, and callers were recruited in the local area which made it easier for repeat calls. A proportionate stratified random sampling approach was applied to obtain the telephone number lists for each caller. As noted by Dillman (1978), the telephone directory was the most readily available source of addresses and telephone numbers, moreover, it was relatively recent and a public document. Telephone calls were

made for random telephone numbers selected proportionately by exchange from the above communities.

Fowler and Mangione (1990) stress the importance of training of interviewers in order to enable interviewers to have fewer non-responses. Therefore, interviewers were given a presentation which explained what the project was about, and stressed the importance for an accurate list of addresses of participants. Interviewers were given a prepared script (as per Fowler, 1988) and then supervised as they practised it on each other (Sheskin, 1985). The script included an introduction to the reason for the telephone call and instructions for the caller that they were to ask to speak to the person in the household, over 18 years old, who would be celebrating their birthday next. The purpose of this question was to ensure randomness in the selection of respondent from any particular household or family unit. This was done in order to avoid bias, such as, the head of the household always filling out the questionnaire, or any other pattern of response that might be characteristic of that particular area (i.e., women might handle most telephone calls in the household). The individual contacted was asked if they were willing to participate in the survey, and if they fished (or not). The callers were periodically supervised during the interview process, which was important for consistency and to limit interviewer effects (Fowler and Mangione, 1990).

Oksenberg, et al. (1986), concluded that interviewers with low refusal rates were likely to have comparatively higher pitched voices, greater ranges of variation in pitch, greater loudness, faster rates of speaking, and clearer and more district pronunciation.

Successful interviewers were characterized as more competent and as having a more positive approach to the respondent and the interview, and exhibited smooth, unhesitant speaking. For the telephone survey, there was overall a 76% rate of success resulting in 900 addresses of individuals who agreed to participate in the survey. In discussing this result with the group leaders, we attributed this rate to several factors including the age of the callers (15-17 years), the lack of previous experience in telephone interviewing, the complexity of the respondent selection question, and surprisingly large number of telephone number that were no longer in service. Female interviewers typically have higher success rate than male interviewers (Fowler and Mangione, 1990); this was not evident here as all but one interviewer was female.

One of the initial concerns with a mail survey, as pointed out by Sheskin (1985), is the typical low rate of return. However, in recent research undertaken by Condon and Adamowicz (1993), in Newfoundland, they reported a response rate of 52% for a general household survey. In a moose hunter survey conducted in 1994, Condon achieved a response rate of 84% (sample size of 1,495). On the basis of these response rates, it was decided to cut off the telephone interviews once 900 addresses had been secured. As there were two distinct groups of participants: non-anglers and anglers, 400 non-angler surveys and 500 angler surveys were sent out.

4.4.2 Application of the survey process

The approach to the layout, printing, and mailing of the questionnaire followed the 'Total Design Method' outlined by Dillman in 1978 where he stressed the importance

of professionalism, personalization, honesty, directness, and attention to detail in survey work. Table 4 - 6 outlines the procedures followed in carrying out the mail survey, which is summarized in Sigler (1990) . The first mailing was the most comprehensive and included the cover letter, which in this case was on the first page of the booklet questionnaire. The numbered questionnaire and a postage-paid return envelope which had the Memorial University of Newfoundland address were the only two items in the envelope. The return envelope was preprinted which meant that it was not as personalized as a return envelope with a stamp which Dillman found to result in increased returns. However, this preprinted return envelope did result in cost savings as only the postage on the used envelopes had to be paid. In order to increase the response rate (Sheskin, 1985) the survey was sent in white envelopes rather than manila with colorful adhesive postage stamps. The package was sent by first class mail and the return address was clearly indicated. The envelope was specifically addressed to the individual who had responded positively in the telephone interview to participating in the survey.

Although the letter was not on official letterhead, it had a title, plus a map of the area referred to in the letter, and the full title and the original signature of the project leader. The letter clearly identified the purpose of the questionnaire and the importance of the individual's participation (Dillman, 1978), and a telephone number was identified for the respondents to call if they had any questions. The survey presentation, in booklet form for a less formidable appearance, used straight-forward, unambiguous questions carefully ordered and presented in a visually attractive manner (Dillman, 1978). To offset

Table 4 - 3: Mailing Procedure for Indian Bay Attitude and Discrete Choice Questionnaire (based on Sigler, 1990)

Item	Mailing list & commitment to participate	First Mailing	Second Mailing	Third Mailing	Comments
Indicate Angler or Non-Angler	Script	X		X	Geographic represent-ation from adjacent communities.
Questionnaire booklet		X		X	The covering letter was the first page of the survey booklet.
Postage paid return envelope		X		X	
Postcard			X		Signed by project coordinator
Weeks from first contact made by telephone	1	3	7	10	Non-response is addressed by multiple mailings
Sent to:	1,180 calls made to secure 900 participants (76% response)	Total sample (900 pieces of mail)	All non-respondents	All remaining non-respondents	

any qualms about expressing their personal preferences and thoughts in a questionnaire, the letter indicated that the respondents confidentiality would be assured.

McDonough *et al.* (1987) discuss how angler reactions are influenced by the characteristics of the communication about regulations. They described the existence of a network approach to the communication of information. This would suggest that network position, i.e., links with other organizations such as, IBEC or government, may be more powerful than individual attributes in explaining resource valuation. Patterns of control and exchange of information influence the value people place on a resource because these patterns influence knowledge, beliefs, and attitudes toward that resource. To counter this concern, the questionnaire was prepared under the auspices of Memorial University of Newfoundland.

Heberlein and Baumgartner (1978) proposed that the number of contacts and salience to the respondent were found to explain 51% of the variance in the final response. They found that government organization sponsorship, type of population, such as specialized sub-groups (i. e.,students, employees, and military personnel) as compared to surveys of the general population, are more likely to return questionnaires. The use of a special class of mail or telephone on the third contact, and the use of metered mail on the outer envelope were found to affect the final response rate. The length of the questionnaire had no or only a slightly negative effect. Dillman (1978) has provided some evidence that length is not necessarily a disadvantage for mail surveys. Sponsorship through Memorial University, doing the pre-mailing telephone survey, plus

following the total design method were hoped to offset the disadvantages of a general public mailing.

The survey was conducted during the period between February to April of 1998. This timing was selected in order to avoid the Christmas season and allow enough time for follow-up mailings well before the summer angling season would begin. The overall response rate for the questionnaire was 486 useable returns, or 54%. Of these, 270 were anglers questionnaires (65%), and 216 were non-angler questionnaires (42%). This means that the response rate achieved the 95% confidence level (+/- 5%).

4.4.3 Preparation of data for analysis.

Data were coded and entered into the SPSS 7.5, Graduate Pack for Windows, SPSS Inc., 1996 statistical program. Missing data could pose a problem for analysis. Tabachnick and Fidell (1996) indicated that the pattern of missing data is more important than the amount missing. In the case of the Indian Bay data, the missing data appeared to occur at random. Approximately 8% of data (N=19) would be missing on average for each variable. Nonetheless, for this research, it was decided to omit the missing data rather than to try to calculate an average value on the basis of an educated guess. This substitute value would have an effect on the statistical calculations as it would modify the emphasis of the real values. Given the generous number of responses to the survey (more than N=486), any surveys which missed an entire section could be omitted from the data base without significantly jeopardizing the validity of the results.

Another consideration for data screening is whether data should be transformed, however, this is only necessary if the data must be normally distributed for statistical

application. For example, the general statement "Tourism is a valuable economic asset to the Indian Bay area" and "Some ponds ...should be kept remote...." and the statement that "The trout resource ...was an important tourist attraction," received very high endorsement by respondents. Therefore, these variables were omitted from some of the statistical calculations. However, according to Tabachnick and Fidell (1996), normal distribution is not necessary for attitude research, therefore no transformations were undertaken for the descriptive statistics or calculation of the Pearson correlation coefficient. The only transformation technique applied was a varimax rotation used in the principal component analysis. This is commonly used to enhance the results of this type of analysis (Tabachnick and Fidell, 1996).

Multi-collinearity and singularity were issues that were addressed during the application of principal component analysis in developing attitude scales. This occurs when variables are very highly correlated, or redundant, that is, one of the variables is a combination of several other variables (Tabachnick and Fidell, 1996). If an index value >30 was found, then multi-collinearity was present. The variables which contributed to this high value were omitted and these were selected based on similarity to other statements (redundancy), and the index value was re-calculated until the appropriate value below 30 could be obtained. Therefore, for the first principal component analysis using all respondent statements only, three statement were excluded in order to achieve an acceptable multi-collinearity value. These were:

- Some ponds in the watershed should be kept as remote areas. (pondremote)
- Tourism is a valuable economic asset to the Indian Bay area.

- Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.

All three of these statement had very high agreement from all respondents. Statements which conveyed similar values were included. For example, statements regarding access into the watershed, the value of the recreational fishery to the local economy, and specific recreational sport fishing options, were included in the survey.

For the second principal components analysis using angler respondent statement only, five statements were excluded in order to achieve an acceptable multi-collinearity value. This was done by systematically running the test for multi-collinearity on these statements. The statements which were excluded were:

- The scenery is important to the enjoyment of a fishing experience in Indian Bay.
- I would not like to fish in an area where I could hear mining activity.
- I would not like to fish in an area where I could hear logging activity.
- It is important to increase the trout population.
- It is important to learn what people think about the trout in the watershed.

For each of these statements, a statement which captured the same value was included. For example, statements about seeing mining or logging activity were included, as well as a statement about the condition of the trout population, and a statement about the importance of learning what people are willing to do in order to have a healthy trout population in the Indian Bay watershed.

The third principal components analysis included only seventeen of the possible 40 statements applied to all respondents and anglers. This was applied to angler responses only to these chosen statements. The statements were selected to focus on the key value under examination, the traditional open access attitude toward the land and

resources of rural Newfoundland. Therefore, each of the three themes were represented: access to cabins, the watershed and fish; development options for the recreational sport fishery and industrial development; and, management issues regarding the condition of the resource and public involvement in management of the resource. Each theme and sub-theme potentially involves infringement on the open access value. Moreover, this combination of statements allows the respondents to indicate preferences that, when combined, could reflect broader value structures, such as: humanity-oriented, individual-oriented, or biosphere-oriented values.

5.0 Results of the Survey

5.1 Introduction and Descriptive Statistics

5.1.1 Introduction

The survey was structured to ask the questions focussed on the traditional open access attitude. This included access into the watershed, access to build recreational cabins, and access to the recreational fish resource. The statements were also structured in order to define the cultural belief system in the Indian Bay area meeting the needs of the methodology applied in previous Cultural Paradigm research. The statements were designed to meet the needs of the Theory of Reasoned Action research by providing sufficient related concepts to explore possible underlying attitude and belief structures for the key issues in the proposed Indian Bay Ecosystem Corporation Management Plan: access, development, and management.

The questions were in the form of statements posed against a 7-point Likert scale where respondents indicated their degree of agreement, disagreement or neutrality. For the purposes of this chapter, each of the twenty attitude and belief statements given to all respondents are referred to as 'All' statements, and the 20 attitude and belief statements given to only angler respondents are referred to as 'Angler' or 'Angler only' statements. Furthermore, in order to minimize the volume of this chapter, these forty statements have been assigned an abbreviation (see Table 5- 1) which is used in this text.

The results of the survey are organized into four sections. This section (5.1) outlines the presentation of the statistics and the descriptive statistics (frequencies). Section 5.2 describes the cultural paradigm models which were developed using principal

Table 5 - 1: List of Survey Statements

Note: Bold text are abbreviations for statements as used in the text of the thesis and references to 'watershed' is understood by respondents to be the Indian Bay watershed.

Theme: Access

Sub-theme: Access to the watershed. (Questions answered by 'All' respondents)

- People should be able to **go anywhere** in the Indian Bay watershed.
- I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed.
- There should be areas of the Indian Bay watershed that have **no road** access.
- Some ponds in the watershed should be kept as remote areas. **(pond remote)**

Sub-theme: **Access to cabins.** (Questions answered by 'All' respondents)

- Cabin **development** causes damage to the natural environment.
- **No** more **cabins** should be built in the Indian Bay watershed.
- Cabin development should be restricted to a few select areas. **(Cabins restricted)**
- There should be **no restrictions** on building a cabin in the watershed.

Sub-theme: **Access to the trout resource.** (Questions answered by 'Anglers' only)

- All Newfoundlanders have a **traditional** right to fish anywhere in the watershed.
- There should be a **check point** on the access road ... where everyone must report.
- Different **regulations** are needed on different ponds in order to provide range of angling opportunities in the Indian Bay watershed.
- Some points in the Indian Bay watershed should be closed to ice fishing **(no ice)**.
- Trout fishing on some ponds in the watershed should be **catch** and release only
- Some ponds in the watershed should be **managed** specifically for trophy trout.
- Trout fishing on some ponds in the watershed should be **fly fishing** only.

Theme: Development

Sub-theme: **General tourism development** (Questions answered by 'All' respondents)

- Tourism is a **valuable** economic asset to the Indian Bay watershed.
- Trout fishing in the watershed is an important tourist **attraction** for the region.
- The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.

Sub-theme: Sport fishing development (Questions answered by 'All' respondents)

- An **outfitting** lodge should be allowed in the Indian Bay watershed.
- Recreational **guiding** services should be increased in the Indian Bay watershed.
- I would be concerned about too many **tourists** taking our fish in the watershed.
- We should **encourage** more people to fish in the Indian Bay watershed.

Table 5-1: List of Survey Statements (Cont'd)

Sub-theme: Mining development (Questions answered by 'All' respondents)

- **Mining** should be allowed in the Indian Bay watershed.
- Mining will directly affect the trout population. **(Minepop)**
- Tourists would not fish in an area where they could hear or see mining activity**(hearmine)**.

Sub-theme: Perceived impact of development on choice of angling destination.

Questions answered by 'Anglers' only:

- The **scenery** is important to the enjoyment of a fishing experience in Indian Bay.
- I would not fish where I could **see a cabin**.
- I would not like to fish in an area where I could **see mining** activity.
- I would not like to fish in an area where I could **hear mining** activity.
- I would not like to fish in an area where I could **hear logging** activities.
- I would not like to fish where I could **see a clear-cut**.

Theme: Management

Sub-theme: Perception and condition of trout resource.

Questions answered by 'All' respondents:

- More **biological** information is needed in order to manage the trout in Indian Bay more effectively.

Questions answered by 'Anglers' only:

- I would like to have a variety of different **angling** opportunities in the watershed.
- The trout population in the Indian Bay watershed has **decreased**.
- It is important to **increase** the trout population.
- Very **little** is **known** about the trout population of the Indian Bay watershed.
- The trout population in the watershed is **vulnerable** and can be easily over fished.
- I would like to have a variety of different **angling** opportunities in the watershed.

Sub-theme: Consultation

Questions answered by 'All' respondents:

- People who use the Indian Bay watershed should have a say in managing the trout fishery. **(manage)**

Questions answered by 'Anglers' only:

- It is important to learn what people **think** about trout in the watershed.
- It is important to **learn** what people are willing to do in order to have a healthy trout population in the Indian Bay watershed.

component analysis. Section 5.3 summarizes the application of the Theory of Reasoned Action by identifying belief or attitude structures that have a predictive relationship with determinant attitudes. Depending upon the receptivity of the determinant attitude to persuasive communications, key messages could be targeted towards the belief/attitude structure that in turn might influence the determinant attitude. The final summary can be found in chapter 6, where the three statistical methodologies will be reviewed in the context of the theoretical framework of the thesis.

5.1.2 Descriptive Statistics

The descriptive results are summarized by the strength of respondent answers to the forty attitude and belief statements (Refer to Appendix Two - Tables Two and Three). These results provide a profile of the prevailing attitudes and beliefs. Moreover, by analysing these attitudes and beliefs by direction and strength assists in exploring opportunities to apply persuasive communications more successfully. There are three categories of attitudes and beliefs: strongly held beliefs, ambivalent beliefs, and the third category consisted of beliefs which had some agreement or disagreement, however, there were over 30% of respondents indicating ambivalence.

Strongly held beliefs were defined as having a Likert scale score of 6 and 7 (on a 7-point scale) where over 50% of respondents agreed with the statement. For example, if 52% of respondents agreed with a statement then if all the neutral and disagreed scores were summed, they would not be greater than the number of respondents that agreed. There were eighteen strong beliefs and attitudes overall, eleven held by all respondents

and seven attributed to the angler only statements. There were no strong beliefs regarding specific economic development or management statements for either group.

Four statements had over 80% agreement from all respondents including three statements overwhelmingly supporting the general economic development statements, plus the value of keeping some ponds remote. Three statements answered by anglers only had over 80% support. Anglers were very interested in increasing the trout stocks (90%,) in learning what people would do to manage the stocks effectively (84%), and believed that scenery was important to the angling experience (82%). All respondents show very strong support for general, broad statements, while the anglers indicate very strong support for statements for personal angling satisfaction and consultation values.

The next set of statements representing strongly held beliefs and attitudes for all respondents (with 52%-65% scores) dealt with the control of vehicular access and cabin development in the watershed, the importance of consulting with users of the watershed, the need for more biological information, and the concern about potential impacts of mining development on the trout resource. For anglers, the corresponding strongly held beliefs (having 54% - 73% scores) included support for voluntary reporting to a checkpoint by all anglers, which is consistent with their equally strong support of the beliefs that trout numbers have declined and they are vulnerable to over fishing. Anglers also strongly believe that we need to know what people think about the trout stocks in order to manage them more effectively. These results indicate that regulations are supported. While trout decrease in population is acknowledged, there is no clear

indication of a potential cause, although there is recognition of the human impact. Again, consultation is strongly supported.

The second category was 'ambivalence' where the sum of the Likert scale scores for slightly agree, neutral and slightly disagree (Lickert values 3, 4, and 5) were greater that either the agree or disagree scores. These ambivalent beliefs and attitudes might offer the greatest opportunity for persuasive communications due to the lack of commitment to a strong position regarding the statement. All respondents were decidedly uncertain about whether cabin development caused damage to the environment or whether a policy of no more cabins should be applied. They were uncertain about allowing mining development. They were still quite ambivalent about allowing outfitting development or encouraging policies in support of developing trophy size trout to attract sport fishermen, and they were very uncertain (52%) about whether to encourage more people to fish at all! Anglers indicated a significant lack of commitment to further scientific research (60%). They were not convinced that the presence of resource extraction related activities, such as mining and logging, were a deterrent to angling activity. On the other hand, they were also ambivalent about having a traditional right to fish anywhere, or having some ponds designated for fly fishing only, catch and release only or closed to ice fishing only. These results indicate that, for all development initiatives whether recreational cabins, recreational fishing or industrial development, the Indian Bay respondents had no fixed position. It is important, from the thesis question viewpoint, to note that the traditional right of access for fishing is also not a fixed belief. How this

belief is associated with the other statements will be explored in the attitude/belief structural analysis.

The third category consisted of beliefs which had some agreement or disagreement, however, there were over 30% of respondents indicating ambivalence. All respondents supported the current open access (**go anywhere**) in the watershed. There was support for contradictory statements that is, support for increasing guiding activity, yet respondents were concerned about tourists taking their fish. For the statements provided to anglers only, the results revealed anglers wanted a variety of angling opportunities and they support regulations. Also, cabin development has little impact on choice of angling destination.

These analysis of the attitude/belief statement results are summarized in Chapter 6.0 where they are presented in the context of their underlying predictive relationships and the implications for persuasive communications.

The recreation participation results indicated a high level of activity in the Indian Bay watershed (Table 5 - 2). Familiarity of the area reduces the possibility of 'created' attitudes where respondents make up an opinion in response to the statement in the questionnaire. Most respondents pursued snowmobiling and visiting a friend's cabin within the Indian Bay watershed. Hunting was also done by most anglers (54%), but only 40% of non-anglers. In contrast, few respondents pursued wood cutting, cross-country skiing and trapping. The primary motives for fishing were priorized as, enjoying nature, relaxation and enjoying friends and family. Yet, anglers indicated that they prefer larger fish and no maximum size limit, and an increased daily bag limit.

Table 5 - 2:
Recreational Activities pursued by Respondents in the Indian Bay watershed.

Recreational Activity	All	Anglers	Non-anglers
Snowmobiling	61%	65%	56%
Visiting a friend's cabin	55	58	51
Hunting	48	54	40
Camping	37	43	31
Boating	36	42	29
Walking	34	34	34
Wildlife viewing	34	36	32
All Terrain Vehicle	26	32	18
Staying at my own cabin	22	24	20
Wood cutting	12	13	11
Cross Country Skiing	11	12	11
Trapping	6	9	4

5.2 The Cultural Paradigm in the Indian Bay area

5.2.1 Principal Components Approach

Principal component analysis was chosen as the statistical method to assist in the development of the cultural paradigm as this technique is concerned with discovering the underlying structure exhibited by a group of variables, in this case, value statements. The resulting groups of variables or values into Components can be interpreted as the underlying value system of the survey respondents related to the Indian Bay watershed and the key management issues related to the Indian Bay watershed. Principal component analysis is concerned only with the "common" sources of variation, that is, the results indicate an estimation of the proportion of the variance of that variable that is held in common with all the other variables. To achieve a solution which sorts out components that best summarize particular clusters of variables, which is the goal of the cultural paradigm research, principal component analysis requires the application of a varimax rotation to the results of the principal components (PC) extraction (which was the first step in the Principal component process). Varimax rotation puts loadings on the variables identified as contributing to the common variation (PC) with the result of maximizing high correlations and minimizing low ones (Tabachnik and Fidell, 1996). This is a transformation process which maximizes the variance of Components by making high loadings higher and low ones lower for each Component. Varimax rotation is most commonly used by human geographers (Tabachnik and Fidell, 1996).

There were three applications of principal component analysis to the Indian Bay questionnaire results. The first 20 questions that were answered by all respondents, both

anglers and non-anglers, provides a sample size of 464. The second set of 20 questions which were answered by anglers only represents a sample size of 260. And a third principal component analysis involved separating the non-angler responses from the first 20 questions and applying principal component analysis to variables selected from the angler responses to all 40 questions (N=260). According to Tabachnik and Fidell, sample size is an important consideration to ensure reliable results. They indicate that a sample size of 200 is considered fair, 300 is good and 500 is very good. Based on this guide, the first proposed application of principal component analysis has a very sound comfort level and the second and third applications, which were for the angler-only respondents, have a rating which is closer to 'good' than 'fair'.

Another consideration for the application of principal component analysis is the distribution of the data. While normality is not required, it does enhance the results. In the results of the Indian Bay questionnaire, there were several variables which had severe skewness. These were removed from the analysis. Another concern in reviewing the data for principal component analysis is the presence of multi-collinearity and singularity. With multi-collinearity, the variables are very highly correlated and with singularity, the variables are redundant (Tabachnik and Fidell, 1996). In order to screen the data, the conditioning index was determined for each set of variables using the criteria of a conditioning index of >30 (Tabachnik and Fidell, 1996).

The questions posed in the questionnaire were broken down into three categories: (1) access to the watershed and resources by local residents for personal use (access, cabins, fishing); (2) development in the watershed: possible economic development of

the trout resource (contribution to the economy, development of outfitting lodge, guiding services) and the impact of industrial development (logging, mining); and, (3) management: the condition and management of the trout resource (local involvement, knowledge of resource). These three categories deal with the central questions at issue with the IBEC watershed development planning process. All three categories were covered in the first 20 questions posed to all respondents. However, in the 20 questions posed to anglers only, the economic development of the trout resource was not covered a second time. The questions were also structured to reflect the three broad categories of cultural values defined in the Generalized Value System summarized in Chapter 3: Individual-, Humanity- or Whole earth/ecosystem-oriented values.

5.2.2 Cultural Paradigm based on questions answered by All Respondents

In the first principal component analysis for all respondents of the 20 questions asked, 17 variables were used as three variables were excluded on the basis of redundancy: "Tourism is a valuable economic asset to the Indian Bay area." and Trout fishing in the Indian Bay watershed is an important tourist attraction for the region" due to skewness, and, "Some ponds in the watershed should be kept as remote (very difficult to access) areas." which was skewed but also redundant. Removal of these three statements resulted in an acceptable conditioning index <30 (See Table 5 - 3).

Six components which explained 60% of the total variance. The first component, which explained approximately 14% of variance, could be characterized as fitting most closely to the "Humanity oriented" value system, in that the variables comprising this

Table 5-3: 'All' respondents to 'All' questions
Results of Rotated Component Matrix, Varimax rotation
Total variance explained by six components: 60.284%.

Component 1: Pro-sport fishing development - "Humanity oriented"
(13.933% of variance; Cronbach Alpha= .6917)

- Recreation guiding services should be increased in the Indian Bay watershed. (.820)
- An outfitting lodge should be allowed in the Indian Bay watershed. (.708)
- The recreational trout fishery of Indian Bay watershed could become an important part of the local economy. (.655)
- We should encourage more people to fish in the Indian Bay watershed. (.613)
- More biological information is needed in order to manage the trout in the Indian Bay more effectively. (480)

Component 2: Anti-Mining (11.166% of variance; Cronbach Alpha= -.8666)

- Mining should be allowed in the Indian Bay watershed. (-.829)
- Mining will directly affect the trout population. (.778)
- Tourists would not fish in an area where they could hear or see mining activity. (.676)

Component 3: Anti-cabin development (9.995% of variance; Cronbach Alpha= .6090)

- Cabin development should be restricted to a few select areas. (.657)
- Cabin development causes damage to the natural environment. (787)
- No more cabins should be built in the Indian Bay watershed. (.655)

Component 4: Pro road and cabin development
(9.838% of variance; Cronbach Alpha= - .3182)

- There should be areas of the watershed that have no road access. (-.722)
- I should be able to drive a vehicle anywhere I want in the Indian Bay watershed. (.709)
- There should be no restriction on building a cabin in the Indian Bay watershed. (.594)

Component 5: "Individual oriented" (7.686% of variance; Cronbach Alpha= .3097)

- People who use the Indian Bay watershed should have a say in managing the trout fishery. (.677)
- People should be able to go anywhere in the Indian Bay watershed. (.720)

Component 6: Anti-tourist (7.562% of variance)

- I would be concerned about too many tourists taking our fish in the Indian Bay watershed. (.817)

Component favoured economic development of the trout resource, such as guiding services and an outfitting lodge as well as encouraging more people to fish, as an important part of the local economy. The inclusion of the statement for more biological information could also be construed to mean that this would enhance management for economic benefit from the resource. This would maximize use of the resource for the greatest number of people as discussed by Merchant, and is consistent with Stern's Altruistic concept, Axelrod's social value, and fits somewhat into Van Liere and Dunlap's "Limits to Growth" value category in the recognition of the need for management and control (see Chapter Three). This is consistent with the second component which was an anti-mining development message (12% variance explained), and the third component (10% of variance) was an anti-cabin development message. All these three components exhibited internal consistency with Cronbach alpha values >0.6 (Nunnally, 1966).

The remaining three components did not exhibit internal consistency. Component four (10% of variance approximately) was a pro-road and pro-cabin development message. Component five (8% of variance approximately) indicated more "Individual oriented" values, and Component six (7.5% of variance) consisted of one statement which could be interpreted in different ways depending upon context. If it was read in the context of the recreational sport fishing questions, it could be interpreted as an expression of resentment to other fishermen. On the other hand, if it was read in the

context of lack of biological knowledge of the trout resource and the vulnerability of the trout population, the statement could be interpreted as a concern for the trout as a species.

Overall, the component analysis results indicate that the economic development of the recreational sport fish resource represents the most important underlying structure to this particular list of variables. Component two (anti-mining) and Component three (anti-cabin) statements indicate a protective attitude towards the primary interest in the use of the watershed and trout resource.

5.2.3 Cultural Paradigm for Anglers based on 'Angler Only' statements

The results of the Component analysis of the angler only responses reveal a different attitude profile. Angler questionnaires contained a second set of 20 questions specifically related to recreational sport fish management. Five of the statementss were removed in order to achieve an acceptable conditioning index. The components that were removed were either highly skewed, redundant, or both. The results of the Component analysis with varimax rotation are found in Table 5 - 4.

Four Components accounted for 55% of the variance. Component one (28% of variance) consisted of five regulatory variables. Interestingly, the statement that "Newfoundlanders had a traditional right to fish anywhere..." had a negative coefficient value which indicates that when this Component is removed from the calculation, a reliability estimate of .6077 occurred. All the management alternatives were new regulations, i.e., catch and release ponds, flyfish only ponds, management for trophy fish, and closure to ice fishing.

Table 5-4: 'Anglers' only to 'Angler' questions
Results of Rotated Component Matrix
Total variance explained by six components: 55%.

Component 1: Pro Regulation (27.791% of variance; Cronbach Alpha= .4320; If remove 'traditional", then Cronbach alpha = .6077

- All Newfoundlanders have a traditional right to fish anywhere in the I.B. watershed.(-.552)
- Different regulations are needed on different ponds in order to provide a range of angling opportunities in the Indian Bay watershed.(.642)
- Some ponds in the Indian Bay watershed should be closed to ice fishing. (.655)
- Trout fishing on some ponds in the Indian Bay watershed should be fly fishing only. (.705)
- Trout fishing on some ponds in the I.B. watershed should be catch and release only. (.526)
- Some ponds in the Indian Bay watershed should be managed specifically for trophy trout.(.697)

Component 2: Angler involvement (10.206% of variance; Cronbach Alpha=.5692)

- There should be a checkpoint on the access road into the Indian Bay watershed where everyone must report. (.650)
- I would like to have a variety of different angling opportunities in the Indian Bay watershed.(.773)
- It is important to learn what people think about trout in the Indian Bay watershed. (.597)

Component 3: Development deters angling
(9.268% of variance; Cronbach Alpha= .7114)

- I would not like to fish in an area where I could see a clear-cut. (.791)
- I would not like to fish in an area where I could see mining activity. (.782)
- I would not like to fish in an area where I could see a cabin. (.705)

Component 4: Vulnerable trout stocks (7.054% of variance; Cronbach Alpha= .4889)

- The trout population in the I.B. watershed is vulnerable and can be easily over fished. (.490)
- Very little is known about the trout population of the Indian Bay watershed.(.776)
- The trout population in the I.B. watershed has decreased. (.582)

These restrictions are internally correlated with the statement "Different regulations are needed on different ponds in order to provide a range of angling opportunities in the Indian Bay watershed." Therefore, these restrictions are linked to the objective of personally being able to derive a wider range of angling opportunities from the implementation of these measures.

Component two (10% approximately of variance) is an interesting combination of variables which indicate a direct personal interest in achieving a variety of angling opportunities linked with consultation with people on what they think about trout and the need for mandatory reporting to a checkpoint on the access road into the watershed. This would imply a belief that 'anglers know best' and that their interests should be served in priority. Component three (9% approximately of variance) was comprised completely of variables indicating that anglers would not fish where they could see cabins, clear-cut or mining development. Component four (7% approximately of variance) consisted of variables speaking to the condition of the trout resource itself: a vulnerable, decreasing population, of which little is known.

Overall, the anglers exhibited values which are reflected most accurately in the "Individual oriented" value category with a 'humanity over nature' hierarchy in values and a clear objective to maximize their own self interest in the trout resource. The modifying Component is that these anglers are willing to be subject to regulations (which translate into restrictions) provided that the objectives of these regulations will enhance the angling opportunities.

5.2.4 Cultural Paradigm based on responses by Anglers for 'All' and 'Angler Only' statements

The third principal component analysis consists of responses from anglers only for a selection of variables from all 40 questions (see Table 5-5). Nine of the questions were derived from the first 20 questions, and 8 were derived from the second set of 20 questions. Again, variables were removed from the principal component analysis due to skewness and redundancy, and the need to achieve an acceptable conditioning index value.

Component one (20% approximately of variance) consists of three variables indicating that the anglers would not fish where they could see a cabin, clear-cut or a mine, moreover, that mining would directly affect the trout population. As well, two other variables indicate angler's concerns for too many tourists fishing, and the fact that little is known of the trout population. These variables exhibited internal consistency with a Cronbach alpha of .6836. The six variables comprising Component One indicate a mixture reflecting the 'whole earth/ecosystem oriented' values by revealing the concern for the condition of the trout resource and lack of knowledge about it as well as the belief in the impact that mining would have on the trout population. This would be consistent with the Van Liere and Dunlap's 'Balance of nature' category (Eagly and Kulsea, 1997). This is taken further in the more personal statements of intention not to fish where they could see mining or clear-cut activity or a cabin revealing an anti-development attitude.

Table 5-5: Results of Principal Components Analysis for Anglers only to 17 of 40 questions.
Total variance explained by six components: 60%.

Component 1: **Anti-development** (19.735% of variance; Cronbach Alpha=.6836)

- Mining will directly affect the trout population. (.570)
- I would be concerned about too many tourists taking our fish in the Indian Bay watershed. (.533)
- I would not like to fish in an area where I could see mining activity. (.791)
- I would not like to fish in an area where I could see a cabin. (.522)
- I would not like to fish in an area where I could see a clear-cut. (.657)
- Very little is known about the trout population of the watershed. (.522)

Component 2: **Traditional values and participation**
(11.163% of variance; Cronbach Alpha=.5371)

- People who use the Indian Bay watershed should have a say in managing the trout fishery.(.507)
- People should be able to go anywhere in the Indian Bay watershed. (.778)
- All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay watershed.(.773)

Component 3: **Pro Regulation** (9.257% of variance; Cronbach Alpha=.5935)

- Trout fishing on some ponds in the watershed should be fly fishing only. (.742)
- Trout fishing on some ponds in the watershed should be catch and release only. (.841)

Component 4: Pro Outfitting (7.095% of variance; Cronbach Alpha=.6768)

- An outfitting lodge should be allowed in the Indian Bay watershed. (.821)
- Recreational guiding services should be increased in the watershed. (.830)

Component 5: **Control cabin development**
(6.811% of variance; Cronbach Alpha=.5386)

- Cabin development should be restricted to a few select areas. (.829)
- Cabin development causes damage to the natural environment. (.676)

Component 6: **Restrict access to watershed and fish**
(6.119% of variance; Cronbach Alpha=.4175)

- Some ponds in the Indian Bay watershed should be closed to ice fishing. (.475)
- There should be areas of the watershed that have no road access. (.776)

Component two (11% approximately of variance) consists of three variables which express the traditional right to fish anywhere, go anywhere in the watershed, and that the users of the watershed should have a say in management. These variables indicate a more "Individual-oriented" set of values. Component three (9% approximately of variance) indicates support for fly-fishing and catch and release regulations. While these two variables relate to restrictions to angling activity, it is not certain whether this Component has any relationship to conservation (whole earth/ecosystem oriented), or a utilitarian approach to management for the purposes of controlling the trout population for the enjoyment of the angler (individual-oriented) . Component four (7% of variance) indicates support for an outfitting lodge and recreational guiding services. These variables also exhibited internal consistency with a Cronbach alpha of .6768. However, it is difficult to establish the significance of this Component as there is no third variable to shed a moderating effect on the relationship of these two pro economic development to the trout resource statements. Component five (7% approximately of variance) indicates support for restrictions on cabin development related to a belief of damage to the environment, and, Component six (6% approximately of variance) consists of variables supporting no road access and closure of some ponds to ice fishing.

5.2.5 Summary of the search for the Cultural Paradigm of the Indian Bay watershed.

There were three principal component analyses conducted to explore the cultural value system of the respondents. The first analysis involving all the participants who

responded to the first twenty statements resulted in a combination of internally consistent statements that could best be characterized as 'Humanity-oriented' or 'homocentric'. The support of the economic development of the sport fishing sector and encouraging more people (not just tourists) to fish as well as the recognition that more biological information is needed to manage the fish resource could be characterized by Merchant as putting the interests of the greatest number of people first (Eagly and Kulsea, 1997). It could also be interpreted to be somewhat 'Individual-oriented' as this would involve an approach putting Van Liere and Dunlap's 'Man over Nature' values (Eagly and Kulsea, 1997). However, Component two (anti-mining) and Component three (**Cabin restrict**) indicate more of a "Limits to Growth" approach. The remaining three Components with no internal consistency reflect 'Individual-oriented' values.

The second principal component analysis involved angler responses to statements only given to anglers (the second set of twenty statements). Only four Components emerged and these also resulted in an interpretation of the statement combinations that favoured first, a Humanity-oriented value system somewhat modified by Individual-oriented values. For example, the denial of the 'traditional' right to fish, combined with support for regulations in general and very specific terms would indicate the interest in maximizing the resource for all users not just for oneself, i.e., the homocentric values of Merchant (Eagly and Kulsea, 1997). Yet again, these can be seen as measures which assert Van Liere and Dunlap's 'Man over nature' values (Eagly and Kulsea, 1997). Unlike the development orientation of the first principal component analysis, these

regulations are aimed at protecting the fish resource which is more of a 'Whole earth/ecosystem oriented' value system, or Merchant's eccentric approach (Eagly and Kulsea, 1997) which reflects Van Liere and Dunlap's 'Balance of nature' values (Eagly and Kulsea, 1997). This is reinforced by Components two and three that reflect Axelrod's values that are socially-oriented (Eagly and Kulsea, 1997). The fourth Component reflects more whole earth concerns regarding the condition of the stocks.

The third principal component analysis was undertaken for anglers responses only to a select number of Components taken from both sets of statements. This allowed for the regulatory statements to be considered in the same analyses as the economic development statements. In this scenario, the individual-oriented values were predominant in Component one (**seeming**, **hearmine**, **see cabin**, and **see clear**, and **tourists**). These were all very egoistic values (Eagly and Kulsea, 1997). Two statements included in Component one provide a modifying affect with 'whole earth' values (**Minepop** and **littleknown**) expressing 'Balance of Nature' concerns. Stern's 'egoistic' values (Eagly and Kulsea, 1997) are further reinforced in Component two (**manage**, **go anywhere**, and **traditional**). Component three which supports catch and release and fly-fishing measures could be interpreted from Stern's bio-spheric point of view in terms of conserving the resource (Eagly and Kulsea, 1997). Combined with the support for outfitting and guiding indicated in Component four, this could probably be more appropriately construed as being part of a 'Humanity-oriented' value system. The final two Components are whole earth oriented (**cabin restriction**, **no road** and **no ice**). Note

that only the individualistic values of Component one and the humanity -oriented values of Component three had any internal consistency.

In summary, while there are strong humanity-oriented values being expressed in the Components for each analysis, there are also strong individual-oriented values which, particularly for anglers, influence the priority values expressed in the principal component analyzes. Which values exert the greatest influence in a decision-making scenario? It would most likely be an issue specific reaction. It would seem that the comparison of the three principal component analyzes reveals that the more directly personal statements explain the greatest variance as compared to the more general, broad statements. These direct personal statements express the anglers intention not to fish where development activity could be seen or heard, whereas general statements consist of statements concerning broader concepts, such as, the importance of recreational sport fishing to economic development.

The cultural value system in the Indian Bay area does not clearly fall into any one cultural paradigm category. Generally, the balance of values for communities in the vicinity of the Indian Bay watershed could be characterized as 'Humanity-oriented' with greater influences from 'Individually-oriented' values, as compared to 'Whole earth/ecosystem-oriented' values. The emphasis on egocentric values would be consistent with the historical reliance on the land for subsistence (see Chapter 2). The generally lower concern about the condition of the trout stocks (which would constitute 'Whole earth/ecosystem oriented values) would be consistent with the history of over

fishing which caused the decrease in both size and numbers of trout in the Indian Bay watershed (Wicks, 1996).

While the survey respondents (N=486) were balanced at non-anglers (N=216) and anglers (N=270), it would seem that the overall population, based on the Canadian Wildlife Service reports (Filion, 1991) indicate proportionately a much higher number of anglers in the Newfoundland population. Therefore, the individualistic values expressed by the anglers need to be addressed carefully in management proposals designed to accommodate or promote economic development of the sport fish resource. There is clearly support for regulations, but these must be designed to balance local needs with the needs of a successful sport fish operation.

5.3 Theory of Reasoned Action: Attitude and Belief Structures

5.3.1 Introduction

The purpose of this thesis was to explore the implications of the cultural value of traditional open access to the land and resources for new management and development proposals. There were three major themes used to develop this thesis for the Indian Bay watershed: access, development and management. Due to the specialized nature of this sport fishing management issue, it was necessary to identify different beliefs under these themes in order to access values held by both anglers and non-anglers living in the communities adjacent to the Indian Bay project area. It was hypothesized that these beliefs would reveal possible belief structures that either reinforced or offset the traditional open access attitude.

Under the theme of access, there were three sub-themes: general access in the form of freedom of movement within the watershed; access to a specific privilege, to develop a recreational cabin that enables residents to access the recreational resources of the watershed; and, access to the trout resource itself. The latter relates specifically to regulations concerning bag limits or gear restrictions, thereby changing the anglers use of the resource. Under the theme of development, two sub-themes were used: sport fish (tourist) related development, which would increase use of the resource or require different management objectives to be employed in order to succeed and industrial resource development, such as mining and logging, which could also have implications for the enjoyment of the angling experience. The third theme, management, first explored the local beliefs about the state of the trout resource and, second, preferences about who should be responsible to manage that resource.

This section describes the underlying beliefs or attitudes (independent variables that combined constitute an attitude or belief structure) which have a predictive relationship with the statements which were posed to both 'All respondents' and 'Anglers only' (dependent variables). The statements included in the survey were developed to test for logical consistency or reasoned action, and to explore inter-related values that might provide the basis for persuasive communications. For each statement, a belief or attitude structure was identified using step-wise linear regression (Moores, 1983; Bath, 1993). The Pearson correlation test was used to identify statistically significant relationships *r* values (see Appendix Three, Tables 1, 2 and 3). The screened statements

were included in the linear regression. The resulting cumulative R squared values indicate the per cent of total variance explained, that is, the proportion of explanation of the statement that could be predicted from the particular attitude or belief structure (Tabachnick and Fidell, 1996). Therefore, for each statement under each sub-theme, the predictive relationships will be summarized as follows. The percentage of variance explained by the statement structure will be given and the statements comprising the statement structure will be listed in order of importance (listed in order of strength of influence, the R squared value). The interpretation of this equation would be, for a positive relationship, as respondent support for the dependent statement increases, the support for the statement with the predictive relationship increases. Figure Two depicts this relationship based on the explanation by Tabachnick and Fidell (1996). The statistical equations are summarized on the following four tables:

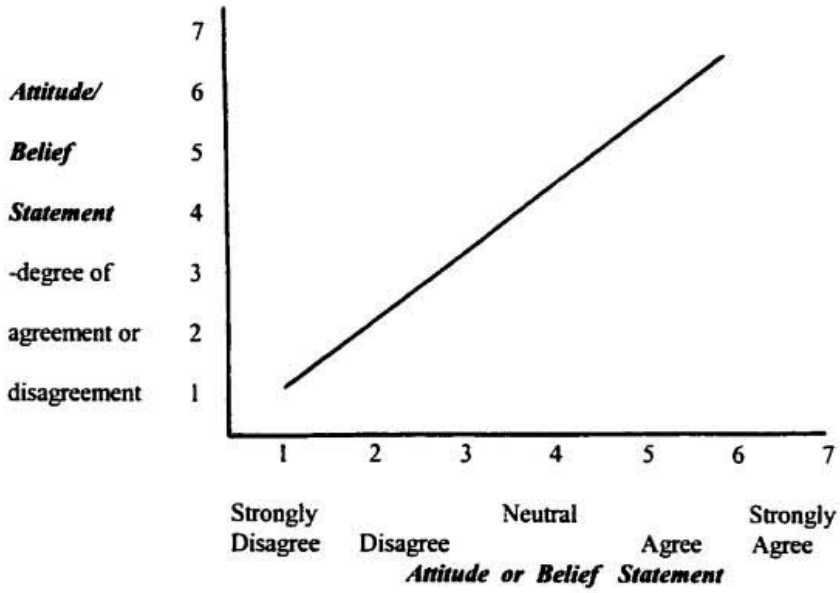
Table 5-6: Access Theme: The Results of the Step-wise Linear Regression;

Table 5-7: Development Theme: The Results of the Step-wise Linear Regression;

Table 5-8: Management Theme: The Results of the Step-wise Linear Regression.

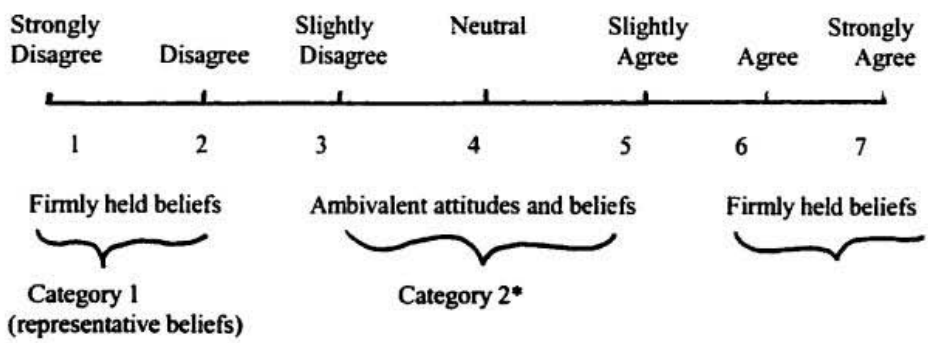
In each Table the results for 'All' statements are applied against 'All' statements (N=468); the results for 'Angler' statements applied to 'Angler' statements (N= 254); the results for 'All' statements applied to 'Angler' statements (N= 254); and the results for 'Angler' statements applied to 'All' statements (N= 254).

Figure Two:
Explanation of Predictive relationship between statements.



Interpretation: The greater the agreement for the statement on the x axis. the greater the agreement on the y axis, therefore the statements have a positive predictive relationship.
The opposite would be true for a negative predictive relationship.

Figure Three:
Opportunities for Persuasive Communications.*



Category 3:*
Statements where there is agreement or disagreement, but also >30% indicate ambivalence.

Table 5-6: Access Theme - Results of Step-wise Linear Regression.

Questionnaire Statements answered by 'All respondents' (first 20 statements)	
All.1	**Dependent Variable: People should be able to go anywhere in the Indian Bay watershed.** Regression equation: Y (go anywhere) = 3.738 + 0.231(drive) + 0.238(manage) + -0.131(no cabins) + -.116 (cabin restricted)
All.2	**Dependent Variable: I should be able to drive a vehicle anywhere I want in the Indian Bay watershed.** Regression equation: Y (drive) = 4.464 + -0.337 (Pond remote) + 0.202 (go anywhere) + 0.168 (Mining) + 0.169 (No restrictions) + -0.136 (No road) + -0.143 (Biological)
All.3	**Dependent Variable: There should be areas of the Indian Bay watershed that have no road access.** Regression equation: Y (no road) = 2.105 + 0.540 (pond remote) + -0.117 (drive) + 0.092 (development)
All.4	**Dependent Variable: Some ponds in the watershed should be kept as remote areas.** Regression equation: Y (pond remote) = 4.171 + 0.326 (no road) + -.180 (drive) + -0.115 (no restrictions) + 0.070 (hear mine) + 0.075 (cabin restricted)
All.5	**Dependent Variable: Cabin development causes damage to the natural environment.** Regression equation: Y (development) = 2.265 + 0.261 (no cabins) + 0.221 (cabins restricted) + 0.107 (no road) + 0.130 (manage) + -0.098 (no restrictions)
All.6	**Dependent Variable: No more cabins should be built in the Indian Bay watershed.** Regression equation: Y (no cabins) + 1.137 + 0.279 (development) + 0.190 (cabins restricted) + 0.161 (tourists) + -.120 (go anywhere) + 0.122 (mining)
All.7	**Dependent Variable: Cabin development should be restricted to a few select areas.** Regression equation: Y (Cabin restricted) = 2.294 + 0.196 (development) + -.177 (no restrictions) + 0.095 (guiding) + 0.157 (no cabins) + 0.131 (Pond remote) + 0.149 (recreational)
All.8	**Dependent Variable: There should be no restrictions on building a cabin in the Indian Bay watershed.** Regression equation: Y (no restrictions) = 4.546 + -.206 (Pond remote) + -0.175 (cabin restricted) + .158 (drive) + -0.105 (development)
Questionnaire Statements answered by 'All respondents' applied to 'Angler' statements	
A-A.1	**Dependent Variable (Statement): People should be able to go anywhere in the Indian Bay watershed. Regression equation: Y (go anywhere) = 1.578 + 0.360 (traditional) + 0.401 (angling) + -0.174 (no ice)**

A-A.2	**Dependent Variable (Statement): I should be able to drive a vehicle anywhere I want in the Indian Bay watershed.** Regression equation: Y (drive) = 5.403 = 0.261 (traditional) + -0.162 (vulnerable) + -0.154 (catch) + -0.133 (see mine) + - 0.200 (population)
A-A.3	**Dependent Variable (Statement): There should be areas of the Indian Bay watershed that have no road access.** Regression equation: Y (no road) = 0.767 + 0.225 (no ice) + 0.454 (increase) + 0.142 (hearmine)
A-A.4	**Dependent Variable (Statement): Some ponds in the watershed should be kept as remote areas.** Regression equation: Y (pond remote) = 0.268 + 0.361 (learn) + 0.171 (managed) + 0.234 (scenery) + 0.136 (population) + 0.095 (hearlog)
A-A.5	**Dependent Variable (Statement): Cabin development causes damage to the natural environment.** Regression equation: Y (development) = 1.692 + 0.300 (see cabin) + 0.208 (fly fishing) + 0.175 (no ice)
A-A.6	**Dependent Variable (Statement): No more cabins should be built in the Indian Bay watershed.** Regression equation: Y (no cabins) = 0.730 + 0.332 (see cabin) + 0.283 (vulnerable) + 0.144 (fly fishing)
A-A.7	**Dependent Variable (Statement): Cabin development should be restricted to a few select areas.** Regression equation: Y (cabins restricted) = 2.557 + 0.199 (see cabin) + 0.129 (no ice) + 0.253 (learn)
A-A.8	**Dependent Variable (Statement): There should be no restrictions on building a cabin in the I. B. watershed.** Regression equation: Y(no restrictions)= 6.178 + -0.466(vulnerable)+ -0.142 (catch)+ -0.138 (see cabin)
Questionnaire Statements answered by 'Anglers' applied to statements answered by 'All respondents'	
AA.1	**Dependent Variable (Statement): All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay.** Regression equation: Y (traditional) = 1.803 + 0.315 (go anywhere + 0.199 (drive) + 0.168 (manage)
AA.2	**Dependent Variable (Statement): There should be a checkpoint on the access road into the Indian Bay watershed where everyone must report.** Regression equation: Y (checkpoint) =3.324 + 0.144 (minepop) + -0.177 (no restrictions) + 0.182 (recreational) + 0.129 (biological) + 0.109 (tourists)
AA.3	**Dependent Variable (Statement): Different regulations are needed on different ponds in order to provide a range of angling opportunities.** Regression equation: Y (regulations) = -0.577 + 0.308 (pond remote) + 0.204 (minepop) + 0.172 (guiding) + 0.223 (attraction) + 0.130 (tourists)
AA.4	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be closed to ice fishing.** Regression equation: Y(no ice) = 0.987 + 0.269 (development) + -.134 (drive) + 0.271 (attraction) + -.151 (go anywhere) + 0.190 (no road) + 0.145 (outfitting)
AA.5	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be catch and release.** Regression equation: Y (catch and release) = 2.146 + 0.199 (pond remote) + -.151 (drive) + 0.196 (biological) + 0.125 development)

AA.6	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be managed for trophy trout only.** Regression equation: Y (managed) = -1.693 + 0.387 (pond remote) + 0.220 (outfitting) + 0.163 (no cabins) + 0.273 (attraction) + 0.147 (development)
AA.7	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be fly-fishing only.** Regression equation: Y (fly fishing) = 2.869 + 0.235 (development) + -0.163 (drive) + 0.164 (guiding)
Questionnaire statements answered by 'Anglers' only	
A.1	**Dependent Variable (Statement): All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay watershed.** Regression equation: Y (traditional) = 4.861 + -0.198 (managed) + 0.302 (angling) + -0.195 (no ice)
A.2	**Dependent Variable (Statement): There should be a checkpoint on the access road into the Indian Bay watershed.** Regression equation: Y (checkpoint) = 1.218 + 0.369 (vulnerable) + 0.234 (angling) + 0.211 (learn)
A.3	**Dependent Variable (Statement): Different regulations are needed on different ponds in order to provide a range of angling opportunities.** Regression equation: Y (regulations) = 0.843 + 0.297 (managed) + 0.381 (vulnerable) + 0.152 (catch and release)
A.4	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be closed to ice fishing.** Regression equation: Y (no ice) = 0.978 + 0.283 (managed) + 0.239 (see clearcut) + 0.206 (fly fishing) + -0.146 (traditional) + 0.149 (pop.)
A.5	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be catch and release only.** Regression equation: Y (catch and release) = -0.567 + 0.323 (fly fishing) + 0.325 (think) + 0.180 (see clearcut) + 0.181 (regulations)
A.6	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be managed specifically for trophy trout.** Regression equation: Y (managed) = 1.486 + 0.374 (regulations) + 0.226 (no ice) + 0.156 (fly fishing) + -0.128 (traditional)
A.7	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be fly fishing only.** Regression equation: Y (fly fishing) = 1.223 + 0.299 (catch and release) + 0.200 (managed) + 0.183 (no ice)

Table 5-7: Development Theme - Results of Step-wise Linear Regression.

Questionnaire Statements answered by 'All respondents' (first 20 statements)	
All.1	**Dependent Variable: Tourism is a valuable economic asset to the Indian Bay area.** No results for step-wise linear regression
All.2	**Dependent Variable: Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.** Regression equation: Y (attraction) = 2.821 + 0.486 (recreational) + 0.085 (encourage)
All.3	**Dependent Variable: The recreational trout fishery of Indian Bay watershed could become an important part of the local economy.** Regression equation: Y (recreational) = 1.291 + 0.437 (attraction) + 0.204 (guiding) + 0.120 (encourage) + 0.059 (cabin restrictions)
All.4	**Dependent Variable: An outfitting lodge should be allowed in the Indian Bay watershed.** Regression equation: Y (outfitting) = 1.081 + 0.470 (guiding) + 0.236 (encourage) + -0.099 (no cabins)
All.5	**Dependent Variable: Recreational guiding services should be increased in the Indian Bay watershed.** Regression equation: Y (guiding) = -0.336 + 0.380 (outfitting) + 0.371 (recreational) + 0.221 (biological) + -0.088 (drive) + 0.096 (cabins restricted)
All.6	**Dependent Variable: I would be concerned about too many tourists taking our fish in the Indian Bay watershed.** Regression equation: Y (tourists) = 3.319 + 0.235 (Minepop) + -.255 (encourage) + 0.152 (no cabins) + 0.137 (manage)
All.7	**Dependent Variable: We should encourage more people to fish in the Indian Bay watershed.** Regression equation: Y (encourage) = 1.132 + 0.242 (recreational) + 0.200 (outfitting) + -0.168 (tourists) + 0.088 (go anywhere) + 0.139 (attraction) + 0.103 (guiding)
All.8	**Dependent Variable: Mining should be allowed in the I. B. watershed.** Regression equation: Y(Mining) = 6.338 + -0.603 (Minepop) + 0.134 (drive)
All.9	**Dependent Variable: Mining will directly affect the trout population.** Regression equation Y (Minepop) = 3.293 + 0.376 (mine) + 0.190 (tourists) + 0.181 (attraction) + .137 (hearmine) + 0.122 (biological)
All.10	**Dependent Variable: Tourists would not fish in an area where they could hear or see mining activity.** Regression equation: Y (hearmine) = 3.014 + 0.254 (Minepop) + -0.204(Mining) + 0.135 (Pond remote)
Questionnaire Statements answered by 'All respondents' and applied to 'Angler' statements	
A-A.1	**Tourism is a valuable economic asset to the Indian Bay area.** Note: no results for step-wise linear regression.

A-A.2	**Dependent Variable (Statement): Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.** Regression equation: Y (attraction) = 4.000 + 0.223 (angling) + 0.150 (regulations)
A-A.3	**Dependent Variable (Statement): The recreational trout fishery of Indian Bay watershed could become an important part of the economy.** Regression equation: Y (recreational) = 2.827 + 0.184 (check point) + 0.121 (no ice) + 0.183 (scenery)
A-A.4	**Dependent Variable (Statement): An outfitting lodge should be allowed in the I. B. watershed.** Regression equation: Y (outfitting) = 2.696 + 0.258 (managed)
A-A.5	**Dependent Variable (Statement): Recreational guiding services should be increased in the Indian Bay watershed.** Regression equation: Y (guiding) = 1.574 = 0.174 (regulations) + 0.249 (checkpoint) + 0.145 (managed)
A-A.6	**Dependent Variable (Statement): I would be concerned about too many tourists taking our fish in the Indian Bay watershed.** Regression equation: Y (tourists) = 1.855 + 0.260 (vulnerable) + 0.163 (hearlog) + 0.161 (little known)
A-A.7	**Dependent Variable (Statement): We should encourage more people to fish in the Indian Bay watershed.** Regression equation: Y (encourage) = 2.604 + 0.192 (angling) + 0.127 (hearlog)
A-A.8	**Dependent Variable (Statement): Mining should be allowed in the Indian Bay watershed.** Regression equation: Y (Mining) = 6.016 + -0.281 + -0.251 (hearmine)
A-A.9	**Dependent Variable (Statement): Mining will directly affect the trout population.** Regression equation: Y (minepop) = 0.391 + 0.299 (see mine) + 0.265 (learn) + 0.204 (vulnerable) + 0.125 (hearlog)
A-A.10	**Dependent Variable (Statement): I would not fish where I could hear mining activity.** Regression equation: Y (hear mine) = -0.491 + 0.301 (see mine) + 0.225 (angling) + 0.171 (hearlog) + 0.235 (learn)
Questionnaire Statements answered by 'Angler respondents' applied to statements answered by 'All respondents'	
AA.1	**Dependent Variable (Statement): The scenery is important to the enjoyment of a fishing experience in Indian Bay.** Regression equation: Y (scenery) = 3.759 + 0.134 (pond remote) + 0.099 (minepop) + 0.109 (manage) + 0.107 (recreational)
AA.2	**Dependent Variable (Statement): I would not fish where I could see a cabin.** Regression equation: Y (see cabin) = .745 + 0.230 (development) + 0.180 (no cabins) + 0.154 (minehear)
AA.3	**Dependent Variable (Statement): I would not fish where I could see mining activity.** Regression equation: Y (see mine) = 0.683 + 0.361 (minepop) + 0.296 (hear mine) + 0.149 (pond remote)
AA.4	**Dependent Variable (Statement): I would not fish in an area where I could hear mining activity.** Regression equation: Y (hear mine) = 2.246 + 0.306 (minepop) + -.216 (mining) + 0.167 (biological) + 0.122 (tourists)

AA.5	**Dependent Variable (Statement): I would not fish where I could hear logging activity.** Regression equation: Y (hearlog) = 1.180 + 0.309 (hear mine) + 0.325 (minepop)
AA.6	**Dependent Variable (Statement): I would not fish where I could see a clear cut.** Regression equation: Y (see clear cut) = 2.081 + 0.204 (hear mine) + 0.176 (development) + 0.171 (pond remote) + -0.134 (mining)
Questionnaire statements answered by 'Anglers' only	
A.1	**Dependent Variable (Statement): The scenery is important to the enjoyment of a fishing experience in Indian Bay watershed.** Regression equation: Y (scenery) = 2.609 + 0.237 (think) + 0.300 (increase) + 0.066 (see mine)
A.2	**Dependent Variable (Statement): I would not fish where I could see a cabin.** Regression equation: Y (see cabin) = 0.535 + 0.213 (see clearcut) + 0.233 (see mining) + 0.133 (no ice)
A.3	**Dependent Variable (Statement): I would not fish where I could see mining activity.** Regression equation: Y (see mine) = 0.018 + 0.496 (hear mine) + 0.270 (see clearcut) + 0.152 (vulnerable) + 0.107 (little known)
A.4	**Dependent Variable (Statement): I would not fish in an area where I could hear mining activity.** Regression equation: Y (hear mine) = 0.275 + 0.652 (hearlog) + 0.320 (see mine)
A.5	**Dependent Variable (Statement): I would not fish where I could hear logging activity.** Regression equation: Y (hearlog) = -0.444 + 0.718 (hear mine) + 0.163 (see clearcut) + 0.134 (angling)
A.6	**Dependent Variable (Statement): I would not fish where I could see a clear cut.** Regression equation: Y (see clearcut) = -0.062 + 0.314 (see mine) + 0.276 (hearlog) + 0.162 (no ice) + 0.168 (catch and release) + -0.165 (regulations) + 0.127 (see cabin) + 0.124 (population)

Table 5-8: Management Theme - Results of Step-wise Linear Regression.

Questionnaire Statements answered by 'All respondents' (first 20 statements)	
All.1	**Dependent Variable: More biological information is needed in order to manage the trout in Indian Bay watershed.** egression equation: Y (biological) = 2.811 + 0.214 (guiding) + 0.136 (mining) + -0.096 (drive) + 9.412 (no cabins) + 0.128 (attraction)
All.2	**Dependent Variable: People who use the Indian Bay watershed should have a say in managing the trout fishery.** Regression equation: Y (manage) = 2.564 + 0.148 (go anywhere) + 0.211 (recreational) + 0.121 (tourists) + 0.125 (pond remote) + -0.102 (dev't)
Questionnaire Statements answered by 'All respondents' and applied to 'Angler' statements	
A-A.1	**Dependent Variable (Statement): More biological information is need in order to manage the trout in Indian Bay watershed.** Regression equation: Y (biological) = 1.357 + 0.439 (learn) + 0.224 (vulnerable)
A-A.2	**Dependent Variable (Statement): People who use the watershed should have a say in managing the trout resource.** Regression equation: Y (manage) = 1.115 + 0.267 (angling) + 0.245 (scenery) + 0.149 (biological) + 0.117 (traditional)
Questionnaire Statements answered by 'Angler respondents' applied to statements answered by 'All respondents'	
AA.1	**Dependent Variable (Statement): The trout population in the Indian Bay watershed has decreased.** Regression equation: Y (population) = 3.381 + -0.162 (no restrictions) + 0.153 (pond remote) + 0.156 (biological) + 0.122 (manage)
AA.2	**Dependent Variable (Statement): It is important to increase the trout population.** Regression equation: Y (increase) = 4.783 + 0.113 (pond remote) + 0.104 (recreational) + 0.089 (no road)
AA.3	**Dependent Variable (Statement): Very little is known about the trout population of the Indian Bay watershed.** Regression equation: Y (little known) = 3.427 + 0.165 (tourists)
AA.4	**Dependent Variable (Statement): The trout population in the Indian Bay watershed is vulnerable and can easily over fished.** Regression equation: Y (vulnerable) = 3.746 + -.212 (no restrictions) + 0.181 (mining) + 0.106 (biological) + 0.122 (tourists) + 0.127 (recreational)
AA.5	**Dependent Variable (Statement): I would like to have a variety of different angling opportunities in the Indian Bay watershed.** Regression equation: Y (angling) 1.215 + 0.149 (manage) + 0.213 (attraction) + 0.147 (go anywhere) + 0.130 (hear mine) + 0.135 (pond remote)

AA.6	**Dependent Variable (Statement): It is important to learn what people think about trout in the Indian Bay watershed.** Regression equation: Y (think) = 2.376 + 0.300 (biological) + 0.143 (manage) + 0.100 (pond remote) + 0.108 (attraction)
AA.7	**Dependent Variable (Statement): It is important to learn what people are willing to do in order to have a healthy trout population.** Regression equation: Y (learn) = 2.418 + 0.164 (pond remote) + 0.170 (biological) + 0.089 (minepop) + 0.128 (attraction) + 0.100 (manage) + 0.069 (no cabins)
Questionnaire statements answered by 'Anglers' only	
A.1	**Dependent Variable (Statement): The trout population in the Indian Bay watershed has decreased.** Regression equation: Y (population) = 0.963 + 0.327 (vulnerable) + 0.303 (increase) + 0.120 (no ice)
A.2	**Dependent Variable (Statement): It is important to increase the trout population.** Regression equation: Y (increase) = 2.903 + 0.252 (learn) + 0.224 (scenery) + 0.111 (population)
A.3	**Dependent Variable (Statement): Very little is known about the trout population of the Indian Bay watershed.** Regression equation: Y (little known) = 2.373 + 0.200 (vulnerable) + 0.137 (see mine)
A.4	**Dependent Variable (Statement): The trout population in the Indian Bay watershed is vulnerable and can easily be over fished.** Regression equation: Y (vulnerable) = 0.704 + 0.265 (checkpoint) + 0.167 (regulations) + 0.268 (learn) + 0.137 (population) + 0.08958 (see mine) + -0.0811 (traditional) + 0.094 (little known)
A.5	**Dependent Variable (Statement): I would like to have a variety of different angling opportunities in the Indian Bay watershed.** Regression equation: Y (angling) = 1.492 + .309 (checkpoint) + 0.115 (hearlog) + 0.173 (think) + 0.100 (traditional)
A.6	**Dependent Variable (Statement): It is important to learn what people think about trout in the Indian Bay waters.** Regression equation: Y (think) = 0.218 + 0.563 (learn) + 0.233 (scenery) + 0.087 (catch and release) + 0.071 (hearlog)
A.7	**Dependent Variable (Statement): It is important to learn what people are willing to do in order to have a healthy trout population.** Regression equation: Y (learn) = 1.654 + 0.344 (think) + 0.147 (vulnerable) + 0.182 (increase) + 0.095 (checkpoint)

In order to assess the opportunity for persuasive communications, it is necessary to understand the strength of commitment to the attitude or belief and degree of ambivalence or uncertainty that could render the respondent susceptible to persuasive messages. Each statement was evaluated by respondents on a 7-point scale to indicate strength of agreement or disagreement. The survey results were grouped into three categories, strongly held, ambivalent, or somewhat supported/not supported but with 30% ambivalent response (Refer to Figure Three). If respondents are uncertain or ambivalent about a particular issue, then the success of a persuasive message could depend on addressing the underlying predictive attitudes and beliefs. The message could be conveyed through education, dissemination of new information, or persuasive communications that is specifically targeted towards influential underlying belief or attitude structures. The strength of commitment to the dependent beliefs and attitudes is then assessed to identify the potential opportunity for persuasive communications.

5.3.2 Theme: Access

5.3.2.1 Sub-theme: Access to the watershed (All respondents)

This sub-theme was explored through four statements:

- People should be able to **go any**where in the Indian Bay watershed.
- I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed.
- There should be areas of the Indian Bay watershed that have **no road** access.
- Some ponds in the watershed should be kept as remote areas **(pond remote)**

Go anywhere was hypothesized as the traditional outdoor right value that would influence local reactions to new land and resource management proposals. **Drive** is an extreme form of access which opens up the back country. **No roads** represents an extreme vehicle control policy (it was also included to test for consistency); and, **pond remote** represents an environmental protection value.

For the statement **go anywhere,** only 14% of variance was explained by four 'All' statements: **drive**, **manage**, and a negative relationship with **no cabin**, and **cabins restricted**. When **go anywhere** was applied to the 'Angler' statements, three statements explained 26% of variance: **traditional**, **angling** and a negative relationship with **no ice** fishing. Overall, these results represent a consistent 'no interference' attitude towards control of type of access, cabin development, or access for fishing. However, one relationship was more abstract and expressed the belief that users of the watershed should be involved in the management of the trout in the watershed. All respondents agreed with **go anywhere** (overall 42% agreement/of which 27% strongly agreed). However, given the level of non-committal 33% response (compared to 25% disagreement) there is an opportunity for changing this belief. The difficulty will be in developing a persuasive message as the results of this statistical analysis indicated the low percentage of variance explained by the above belief statements. Therefore, there is minimum guidance in designing a persuasive message.

Drive had six 'All' statements explaining 33% of total variance. Not surprisingly, the first variable was a negative relationship with **pond remote**. The other five contributing attitudes included **go anywhere, mining, no restrictions**, and a negative relationship to **no road** and **biological**. For the 'Angler only' statements which accounted for 22% of total variance, the strongest positive relationship was with **traditional**, and a negative relationship with **vulnerable, catch, see mine**, and **population**. Obviously the belief system underlying **drive** consists of attitudes supporting unrestricted recreational and industrial use of the watershed combined with a lack of knowledge about the pressures on the fishing resource. **Drive** elicited is a firmly held belief by all respondents where 63% disagreed with **drive** (only 26% were ambivalent). Therefore, proportionately all respondents would reject the underlying beliefs and attitudes which have a predictive relationship with **drive.**

No road had 30% of total variance explained by three 'All' statements: **pond remote**, a negative relationship with **drive**, and a positive relationship with **development**. 'Angler only' statements explained only 16% of variance and included: **no ice, increase** and **hear mining**. These underlying belief systems consist of preservation oriented attitudes for both the watershed and the trout resource. **No road** had a high level of support with 60% of respondents indicating that they agreed with this statement; therefore, combined with the 30% predictive relationship with this attitude and belief

structure, the values of **pond remote** and **no ice** in particular could be considered reasonably prevalent in this Indian Bay area.

All respondents indicated very strong support for **pond remote** with 80% agreement. Five 'All' statements explained 38% of the total variance: **no road**, disagreement with **drive**, and a **no cabin restrictions** policy, a positive relationship with **hearmine** and **cabin restrict**. When **pond remote** was applied to 'Angler only' statements, five statements explained 28% of total variance: **learn**, **managed**, **scenery**, **population** and **hearlog**. Support for pond remote does not involve outright rejection of all development, but rather support for regulatory management measures combined with a concern about the impact of these developments. This attitude strongly rejects the notion of being able to drive anywhere. The strongest relationship for anglers was associated with managing the trout population, where there is strong support for consultation (**learn**). Interestingly, there is a positive relationship with managing the stocks for trophy trout which would be supportive of recreational sport fish development. Considering the 80% support for this statement and 38% variance explained by this belief structure, it could be considered an important set of values in the people living in this area.

In summary, for the sub-theme, access to the watershed, there was a high level of support from all respondents for keeping some ponds remote (80%), that is, having no roads (60%) and no ability to drive (63%) a vehicle to these ponds. It was significant that while the statement proposing that people should be able to go anywhere in the watershed received 42% agreement, there was still a 33% ambivalent response. This statement was

further separated from the other access statements in that the predictive relationships were stronger from the angler statements (as compared to the statements provided to all respondents). The underlying relationships were concerned with protecting traditional access, increasing angling opportunities and aversion to closing ponds to ice fishing. The support for the limited access statements could be attributed to the fact that the question was worded to relate to some ponds in the watershed as compared to limiting access throughout the watershed. These statements also had strong predictive belief structures (30-38%).

Combined with the high level of overall support, these attitudes and beliefs could be considered to be representative of a broader value system for the people living adjacent to the Indian Bay watershed. The cultural context of the Indian Bay area could be characterized as being supportive of controls, concerned about industrial development, and supportive of consultation. Interestingly, there was no direct relationship (positive or negative) with the tourism development statements.

Therefore, if a manager was developing a persuasive message to encourage tourism, the message would not necessarily be enhanced by including points on access within the watershed. However, if a manager was interested in developing a message regarding access, consultation would be advisable as respondents indicated considerable ambivalence for both regulations and concern about development. This is discussed in more detail in the following text.

5.3.2.2 Sub-theme: Access to cabins (All respondents)

Access to crown lands is currently not managed in any formally organized manner. In order to explore the reaction to possible government regulations, which could be construed as an infringement of outdoor privileges, the concept of cabin development was included in the survey. This was important to round out the attitude towards regulation of the outdoors, as there were both anglers and non-anglers included in the survey and most of the specific regulatory questions were focussed on angling. The traditional right to a cabin on crown land is recognized in government policy whereby all Newfoundlanders are able to acquire permission to construct a recreational cabin on crown land for a nominal fee (Power, per. com., 1997). Recreational cabin development is often considered a traditional 'right' to the enjoyment and use of crown land (Power, per. com., 1997). Four statements were developed to explore attitudes towards cabin development:

- Cabin **development** causes damage to the natural environment.
- **No** more **cabins** should be built in the Indian Bay watershed.
- Cabin development should be restricted to a few select areas (**Cabins restricted**).
- There should be **no restrictions** on building a cabin in the Indian Bay watershed.

For **development**, five statements accounted for 22% of the total variance: **no cabins, cabin restricted, no road, manage,** and a negative reaction to **no restrictions**. **Manage** is the only statement which does not have a direct connection to the dependent belief. When 'Angler' statements were applied to **development**, three statements accounted for 22% of total variance: **see cabin, fly fishing** and **no ice.** Although the

statement expresses a concern for the potential environmental impact and visual intrusion of cabin development. Conservation oriented gear restrictions were also favoured in this belief system. A total of 41% of all respondents indicated an ambivalent response to **development**, and 31% of all respondents agreed (19% strongly agreed), while 24% disagreed (14% strongly disagreed). Therefore it would appear that there is considerable opportunity for this belief to be influenced by persuasive communications.

The policy of **no cabins** had 24% of total variance explained by five statements: **development, cabins restricted, tourists,** a negative relationship with **go anywhere** and **mining**. The inclusion of **tourists** and **mining** indicate that this no development attitude is interconnected with a wider concern with development and use of the resources of the watershed. When **no cabins** was applied to 'Angler' statements, three statements accounted for 19% of total variance: **see cabin, vulnerable** and **fly fishing**. The belief in the vulnerability of the trout resource and support for conservation motivated gear restrictions, fly fishing, further reinforces the concern about development. For **no cabins,** 47% of respondents were ambivalent; only 30% of all respondents agreed (22% strongly agree), and 23% disagreed, for a total of 53% with a defined preference. However, the high level of ambivalence provides an opportunity for persuasive communications to influence this belief.

For **cabins restricted,** six 'All' statements explain 25% of the variance: **development,** a negative relationship to **no restrictions**, then a positive relationship with **guiding, no cabins, pond remote** and **recreational**. This pro-regulation statement is

connected to pro-watershed protection and pro-economic development beliefs. When **cabins restricted** was applied to 'Angler' statements, three statements explained only 11% of total variance: **see cabin**, **no ice**, and **learn**. While the most influential statements conveyed the obvious protection oriented messages, they were interspersed with pro-tourism development and consultation statements. **Cabins restricted** received 59% overall agreement (of which 41% strongly agreed) and 28% were ambivalent (only 13% disagreed). Given the strong agreement with this statement and the consistent supportive statements associated with this value, it would appear that protection values via regulatory versus moratorium style measures are part of an important underlying belief system for the people in the area.

For the statement, **no restrictions**, four 'All' statements only accounted for 19% of variance with a negative relationship with **pond remote, cabins restricted, development.** The only positive relationship, not surprisingly, was with opportunity to **drive** anywhere in the watershed. For 'Angler' statements, three statements accounted for 19% of total variance: a negative relationship with **vulnerable, catch** and **see cabin**. **No restrictions** received a strong negative reaction with 65% of all respondents disagreeing (52% strongly disagreed) with no control over cabin development.

For the sub-theme, access to cabins, restrictions on cabin development were strongly supported (59%), and no restrictions were even more strongly feared (65%). The strongest underlying predictive attitudes express a concern about the protection of the environment and resources, with a lesser concern about potential intrusiveness of cabin

development. Given the high level of non-committal response to no cabin policy proposal (47% ambivalence) and the statement that cabin development is harmful to the environment (41% ambivalence), it can be concluded that there is not an overwhelming anti-cabin development attitude. There is no strong relationship to tourism statements. The potential for cabin over-development becoming a deterrent to angling activity is a concern; however, this issue should be addressed by the strong support for controls on cabin development. Also, there is the predictive relationship with cabin restrictions and pro-watershed protection and pro-economic development values.

5.3.2.3 Sub-theme: Access to the trout resource (Anglers only).

The third sub-theme under access is access to the angling resource, the trout. Seven statements were formulated for anglers:

- All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.
- There should be a **check point** on the access road to the watershed where everyone must report.
- Different **regulations** are needed on different ponds in order to provide a range of angling opportunities in the Indian Bay watershed.
- Some ponds in the Indian Bay watershed should be closed to ice fishing **(no ice)**
- Trout fishing on some ponds should be **catch** and release only.
- Some ponds should be **managed** specifically for trophy trout.
- Trout fishing on some ponds in the Indian Bay watershed should be **fly fishing** only.

For the 'Angler only' statement **traditional,** only 14% of variance was explained by three statements: a negative relationship with **managed** and **no ice**, and a positive relationship with **angling**. Three 'All' statements accounted for 23% of total variance: **go**

anywhere, drive and **manage**. For **traditional**, 47% of all respondents indicated agreement (31% strongly agreed), while only 19% disagreed, and 37% indicated that they were ambivalent. This is a similar pattern to **go anywhere**, although not quite as balanced as anglers indicate a stronger agreement with **traditional** versus disagreement. However, the ambivalent responses were proportionately the same, offering some opportunity for persuasive communications.

For **checkpoint**, three Angler statements accounted for 32% of total variance: **vulnerable**, **angling**, and **learn.** Five 'All' statements accounted for 20% of total variance: **minepop**, a negative relationship with **no restrictions**, and positive relationships with **recreational, biological** and **tourists**. **Checkpoint**, a statement that could be interpreted as an infringement on freedom of access as well as an undue policing measure on anglers, nonetheless, **checkpoint** received 73% agreement (56% strongly agreed). This is an important response from anglers who are essentially indicating a willingness to be pro-active in reporting fishing activity and movement within the watershed. This reporting requirement could be otherwise seen as an infringement on open and free use of the watershed and the fish resource, yet the anglers are strongly supporting it. This strong support would also suggest that the underlying beliefs about the vulnerability of the resource, particularly from the impacts of mining, are common to the people living in the Indian Bay area.

For **regulations**, three 'Angler' statements accounted for 37% of total variance: **managed, vulnerable**, and **catch**. Five 'All' statements accounted for 29% of total

variance: **pond remote, minepop, guiding, attraction**, and **tourists**. The underlying attitudes and beliefs combine support for protection of the resource with support for sport fish development. While **regulations** received 48% agreement (30% strongly agree), only 14% disagreed, and 38% were ambivalent. Therefore, there would be some opportunity for persuasive communications.

For **no ice**, five 'Angler' statements explained 33% of total variance: **managed, see clearcut, fly fishing,** a negative relationship with **traditional** and a positive relationship with **population.** Six 'All' statements accounted for 27% of total variance: **development**, a negative relationship with **drive**, a positive relationship with **attraction**, a negative relationship with **go anywhere** and positive relationships with **no road** and **outfitting**. For **no ice,** there was 33% agreement (22% strongly agreed), 28% disagreed (19% strongly disagreed), and 39% were ambivalent. This suggests that this attitude would be open to influence by persuasive communications. In the recreational activity questions, respondents indicated that 61% participate in snowmobiling in the Indian Bay watershed, and of these, 66% participate in angling. Therefore, it is notable that the proposal to close some ponds to ice fishing is not rejected outright by the respondents.

For **catch**, four 'Angler' statements explained 30% of total variance: **fly fishing, think, see clearcut**, and **regulations**. Four 'All' statements accounted for 14% of total variance: **pond remote**, a negative relationship with **drive**, a positive relationship with **biological** and **development**. **Catch** received 39% agreement, 23% disagreed and 38%

were ambivalent. This suggests that this attitude would be open to influence by persuasive communications.

For **managed**, five 'Angler' statements explained 29% of total variance: **regulations**, **no ice**, **fly fishing** and **traditional**. For 'All' statements, five accounted for 29% of total variance: **pond remote**, **outfitting**, **no cabins**, **attraction** and **development**. While **managed** received 39% agreement, 18% strongly disagreed, and 43% were ambivalent. This suggests that this attitude would be open to influence by persuasive communications. When asked why they fish, anglers indicated ambivalence towards the objective of catching a trophy trout (49%), and 37% indicated that it was not important. On the other hand, when asked about the size of a trophy trout, 30% indicated 46-51 cm, rather than the provincial standard of 40 cm (19%). Moreover, in terms of the weight of a trophy trout, 44% preferred a 4-5 pound fish, again larger than the provincial standard.

For **fly fishing**, three 'Angler' statements explained 29% of total variance: **catch**, **managed** and **no ice**. Three 'All' statements accounted for 15% of total variance: **development**, a negative relationship to **drive**, and a positive relationship to **guiding**. **Fly-fishing** had a similar pattern with 32% agreement (18% strongly agreeing), 26% disagreement (15% strongly disagreeing), and 42% were ambivalent. This suggests that this attitude would be open to influence by persuasive communications. Fly fishing is not the usual technique used by trout anglers. When anglers were asked if they ever fly fished for trout, their response paralleled the response to using the fly fishing technique as

a regulatory conservation measure. That is, 40% of anglers have fly fished for trout, 31% do not fly fish, and 31% sometimes fly fish for trout.

In summary, for the sub-theme access to the sport fish resource, only the statement to receive strong support was that all anglers should report to a checkpoint (73%). The underlying predictive beliefs and attitudes related to this statement (32% of variance) expressed strong concern regarding the vulnerability of the trout stocks to over fishing, the recognition that anglers wanted a greater variety of angling opportunities, and that managers must learn what people are willing to do in order to improve the trout fish resource. Anglers indicated considerable ambivalence when addressing the five specific sport fish regulation statements. This was a highlighted by the results for two opposing viewpoints: 'All Newfoundland anglers have a traditional right to fish anywhere in the watershed, and 'Regulations are needed in order to provide a variety of angling opportunities.' For both statements, 48% of anglers were in agreement and 37% indicated ambivalence. Moreover the underlying attitude structure indicated that traditionalists rejected managing pond for trophy trout, yet supporters of regulations supported this management measure and to an even greater extent. If we examine this relationship further, as part of a hierarchy in the belief/attitude structure, the reaction to the proposal to manage some ponds for trophy fish received an even greater ambivalent response (43%). However, the associated predictive relationships indicate support from the pro-regulation viewpoint, the control over access (**pond remote**) viewpoint, and to a lesser degree, from those who support outfitting and environmental protection. The

specific regulatory measures which propose that some ponds be closed to ice fishing, or restricted to catch and release or fly-fishing only restrictions, all exhibited ambivalence (38-46%). As these would be new regulations, this ambivalence is not surprising.

It is notable that there is more agreement than disagreement for regulatory measures. The predictive relationships were obvious in that each regulatory measure was supported by attitudes supporting the other regulatory measures. Only the regulation proposed to enhance trophy fish had the obvious predictive relationship with outfitting (which would benefit from this measure). It was surprising that there were no direct predictive relationships with consultation statements.

5.3.3 Theme: Development

5.3.3.1 General tourism development (All respondents)

There were three statements included on this theme:

- Tourism is a **valuable** economic asset to the Indian Bay watershed.
- Trout fishing the Indian Bay watershed is an important tourist **attraction** for the region.
- The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.

For **valuable**, 'All' respondents indicated 99% strong agreement with this statement. For **attraction,** only two 'All' statements accounted for 39% of the total variance: **recreational** and **encourage**. Two 'Angler' statements accounted for 10% of total variance: **angling** and **regulations**. An overwhelming 84% indicated that 'Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.' For **recreational**, four 'All' statements accounted for 42% of total variance: **attraction**,

guiding, encourage and **cabin restricted**. For recreational, three 'Angler' statements accounted for 11% of total variance: **checkpoint, no ice**, and **scenery**. An overwhelming 82% agreed that 'The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.' . Therefore, the strong support for these beliefs could be considered to be prevailing value systems in the Indian Bay area. Despite the strong support for these general statements, the respondents had more difficulty in dealing with options for development of the trout resource.

The statements included in the general economic development sub-theme were very strongly supported with 99% of the respondents agreeing that tourism is a valuable economic asset in the Indian Bay area. However, this viewpoint had no predictive relationships with the other statements in the survey. All survey respondents strongly believed that recreational trout fishing could become an important part of the local economy (82%). While the predictive relationships of these two statements showed the strongest relationship between each other, the attitude/belief structure also included the belief that more guiding should be allowed and that cabin development should be restricted.

Given the high level of support for these statements, and the strong predictive relationship, it would be logical to assume that this belief system would be representative of the prevailing values in the Indian Bay area. The belief to restrict cabins is strong, and the statement to encourage guiding was supported by 42% of all respondents . However, both the encouragement of guiding and having more people fish in the watershed also had

a large ambivalent response. Therefore, if the strong agreement with these general statements was going to be used as the basis for promoting recreational sport fish outfitting opportunities, then the persuasive messages would have to address the issue of the perception of too many people fishing in the Indian Bay watershed, whether they are local people or tourists brought in by guides.

5.3.3.2 Specific sport fishing development (All respondents)

There were four statements included for this sub-theme:

- An **outfitting** lodge should be allowed in the Indian Bay watershed.
- Recreational **guiding** services should be increased in the Indian Bay watershed.
- I would be concerned about too many **tourists** taking our fish in the Indian Bay watershed.
- We should **encourage** more people to fish in the Indian Bay watershed.

For **outfitting,** three 'All' statements accounted for 30% of total variance: **guiding, encourage** and negative relationship with **no cabins**. Only one 'Angler' statement accounted for a mere 6% of total variance: **managed**. In response to **outfitting,** 33% of all respondents disagreed (26% strongly disagreed), 28% agreed, and 39% were ambivalent. While 61% of respondents are committed to a position on outfitting, the high level of ambivalence suggests that there is room for persuasion.

For **guiding**, five 'All' statements accounted for 41% of total variance: **outfitting, recreational, biological**, a negative relationship **with drive** and positive relationship with **cabins restricted**. Three 'Angler' statements accounted for only 13% of total variance: **regulations, checkpoint and managed.** Approximately 57% of all

respondents agreed (26% strongly agreed), only 18% disagreed and 25% were ambivalent about supporting an increase in recreational guiding services.

For **tourists**, four 'All' statements accounted for only 16% of total variance: **minepop, encourage, no cabins**, and **manage**. For **tourists**, three 'Angler' statements accounted for 11% of total variance: **vulnerable, hear log**, and **little known**. While 44% of all respondents indicated agreement for **tourists** (29% strongly agreed), 15% disagreed, and 41% were ambivalent. This suggests that there is latitude for persuasive influence on this attitude.

For **encourage**, six 'All' statements accounted for 27% of total variance: **recreational, outfitting, tourists, go anywhere, attraction** and **guiding**. Only two 'Angler' statements accounted for 27% of total variance: **angling** and **hear logging**. While 27% of agreed and 21% disagreed, there were 52% who were ambivalent. This ambivalence offers an opportunity for persuasion with regard to this attitude.

In summary, despite the strong support for the general statements, the respondents had more difficulty dealing with specific development proposals for the trout resource. There was considerable hesitancy about encouraging more people to fish in the watershed (52% ambivalence). In addition, while respondents indicated a concern about tourists taking their fish (44%), almost as many were uncertain of that opinion (41% ambivalent). Moreover, while outfitting was rejected by 33% of respondents, there was even greater uncertainty about outfitting (39% ambivalence). Only recreational sport fish guiding was firmly supported by 42% of respondents. This positive response could be due to the less

intrusive approach of a guiding service as compared to the physical structure of a lodge which is usually associated with outfitting. Even the positive response to guiding was modified by a 40% of respondents indicating ambivalence. The predictive relationships indicating the underlying attitude/belief structure consisted generally of strong connections amongst these tourism-related statements.

There were a few interesting connections with associated issues that are useful to managers who desire to address the pertinent issues related to a new management proposal. For example, if the new initiative was to promote an outfitting development, the negative predictive relationship with a no cabin development policy becomes an issue for the manager to address. Also, if the agenda is to promote support of the policy to encourage more people to fish in the Indian Bay watershed, two other issues would have to be considered: the concern about tourists taking away the local anglers fishing opportunities; and that local anglers would like to be assured that they would still be able to go anywhere in the watershed.

5.3.3.3 Mining Development

There were three statements included to test the reaction to proposed mining activity and how it might impact the Indian Bay watershed:

- **Mining** should be allowed in the Indian Bay watershed.
- Mining will directly affect the trout population. **(Minepop)**
- Tourists would not fish in an area where they could hear or see mining activity. **(hearmine)**

For **mining,** two 'All' statements accounted for 30% of variance: a negative relationship with **minepop** and a positive relationship to **drive**. Two 'Angler' statements accounted for 18% of total variance: **see mine** and **hear mine**. In response to **mining,** 37% of all respondents disagreed (28% strongly disagreed), 23% agreed, and 40% were ambivalent. These ambivalent respondents are not entrenched in strong positions and present an opportunity for persuasive communication which could undermine current respondent disagreement with mining.

For **minepop**, five 'All' statements accounted for 40% of total variance: a negative relationship with **mining,** and positive relationships with **tourists, attraction, hearmine** and **biological**. Four 'Angler' statements accounted for 34% of total variance: **scenery, learn, vulnerable** and **hear log**. Approximately 52% agreed (35% strongly agreed), only 9% disagreed; and 38% were ambivalent. While there is a substantial number of respondents who are relatively non-committal, there is a strong commitment to this belief.

For **hearmine**, three 'All' statements accounted for only 18% of total variance, **minepop, mining** and **pond remote**. Three 'Angler' statements accounted for 31% of total variance: **see mine, angling, hear log** and **learn**. While 33% of all respondents agreed (20% strongly agreed), 20% disagreed, 47% were ambivalent. This would indicate an opportunity for persuasive communications.

To gauge the local response to industrial development, three statements were included regarding mining development. When respondents were asked whether mining

should be allowed in the Indian Bay watershed, 37% disagreed, although 40% were ambivalent. This level of uncertainty should not be surprising considering the high level of unemployment in these communities. In terms of predictive relationships with the other survey statements, only two beliefs were relevant: that mining has a negative affect on the health of the trout population, and that people should not be allowed to drive anywhere in the watershed. Respondents were consistent in answer to whether mining has a harmful effect on the trout with 52% agreement (38% ambivalent).

The strongest predictive relationships was understandably against mining development, but also included a concern about tourists catching too many fish and the vulnerability of trout to over fishing, the belief that recreational fishing is an economic benefit and that to hear or see mining would deter anglers from fishing in the watershed, the belief that more biological information is needed to manage the trout effectively, and the statement that we must learn what people are willing to do in order to have a healthy trout population. Yet, for the statement which claimed that anglers would not fish in an area where they could hear mining activity, 47% of respondents were ambivalent (although 33% agreed). The predictive relationships consisted of the expected connection with anglers not wanting to fish where they could see a mine or hear logging activity, but also with the desire to have a greater variety of angling opportunities and to learn what people are willing to do in order to have a healthy trout population.

The attitude and belief structure underlying the rejection of mining development stems from concerns about the direct environmental impacts of mining on the resources

of the watershed , as well as indirect impacts associated with increased access. The predictive relationships indicate that these perceived impacts are in direct conflict with sport fish development objectives. The angler's indifference to the presence of mining when selecting angling destinations would logically reflect some of the same ambivalence towards allowing mining development in the watershed. Therefore, if a mining company addressed the environmental concerns and perhaps reinforced the development of the sport fishing opportunities, the negative reaction to a proposed mining development could be overcome.

5.3.3.4 Perceived impacts of development on anglers (Anglers only)

In attempt to link development and angling, the statements included in the survey examined the value of scenery to the quality of the angling experience and the impact of different types of development to the behavior of the angler. Past research has indicated that scenery is an important aspect of a satisfying fishing trip. Therefore, for 'Angler' only respondents, the development theme was explored by measuring the impact of development related changes to the scenery on angling behaviour. This was confirmed by the solid positive response by Indian Bay anglers to this statement.

- The **scenery** is important to the enjoyment of a fishing experience in Indian Bay.
- I would not like to fish in an area where I could **see a cabin**.
- I would not like to fish in an area where I could **see mining** activity.
- I would not like to fish in an area where I could **hear mining** activity.
- I would not like to fish in an area where I could **hear logging** activities.
- I would not like to fish in an area where **see a clear cut**.

For **scenery**, three 'Angler' statements accounted for 24% of total variance: **think, increase** and **see mining**. Four 'All' statements accounted for 15% of total variance: **pond remote, minepop, manage**, and **recreational**. Anglers overwhelmingly supported the value of **scenery** with 82% agreement (60% strongly agreed); therefore, this belief system could also be considered to consist of values prevalent in the Indian Bay communities. When anglers were asked about their motivations for fishing, 90% indicated 'to enjoy nature' (67% indicated that this was very important).

For **see cabin**, three 'Angler' statements accounted for 22% of total variance: **see clearcut, see mining**, and **no ice**. Three 'All' statements accounted for 18% of total variance: **development, no cabins**, and **minehear**. Approximately 47% of anglers disagreed with **see cabin** (30% strongly disagreed), only 15% agreed, and 38% who were ambivalent and therefore possibly receptive to persuasive messages.

For **see mining**, four 'Angler' statements accounted for 56% of total variance: **hearmining**, see **clearcut, vulnerable** and **little known**. Three 'All' statements accounted for 32% of total variance: **minepop, hear mine** and **pond remote**. While 42% of anglers agreed with **see mine** (30% strongly agreed), only 16% disagreed and 42% were ambivalent and therefore, possibly open to persuasive messages.

For **hear mining** only two 'Angler' statements accounted for 74% of total variance: **hear logging** and **see mining**. Four 'All' statements accounted for 26% of total variance: **minepop, mining, biological** and **tourists**. The impact of **hearmine** or **see**

mine was more negative than any other development. For **hearmine,** 41% of all respondents agreed, 20% disagreed, and 39% were ambivalent; therefore, potentially influenced by persuasive communications.

For **hear logging**, three 'Angler' statements accounted for 71% of total variance: **hear mining, see clearcut** and **angling**. Two 'All' statements accounted for 24% of total variance: **hear mine** and **minepop**. While 30% of anglers agreed with **hear log**, 23% disagreed, and 48% were ambivalent and therefore vulnerable to persuasive messages.

For see **clearcut**, seven 'Angler' statements accounted for 48% of variance: **see mine, hear log, no ice, catch, regulations, see cabin** and **population**. Four 'All' statements accounted for only 18% of total variance: **hear mine, development, pond remote**, and a negative relationship with **mining**. Approximately 29% of anglers agreed with **clearcut** (21% strongly agreed), and 21% disagreed, and 49% were ambivalent; therefore open to persuasive influences. This could be partially explained by the fact that only 12% of the respondents participated in woodcutting in the watershed. Therefore, any logging activity would be commercial, and correspondingly on a larger scale.

The impact of industrial development on angling activity was explored by measuring whether anglers would be deterred from fishing in an where such development could be seen or heard. To set the context for measuring visual and audio intrusion, it was first necessary to establish that scenery was important to the angling experience and 82% agreed with this statement.

The results indicated that the anglers did not consider cabin development to have a negative visual impact that would deter fishing in an area (47% disagreed). There were no significant predictive relationships with other survey statements. Essentially the same number of respondents agreed that mining activity was an deterrent to angling as those indicating ambivalence. While respondents agreed that hearing logging or seeing clear-cuts was an intrusion (30%), they indicated a high degree of ambivalence towards this intrusion (48%). The acceptance of cabins and resource extraction activities could be attributed to the fact that only local anglers were included in the survey, and these activities are simply everyday reality.

The mining and logging statements had extremely high predictive relationships with the obvious high levels of support between statements which essentially conveyed similar concerns, particularly, the statements regarding hearing mining or logging. However, the statements regarding seeing mining or clear-cuts indicated predictive relationships with statements expressing concern for the trout stocks in terms of vulnerability to over fishing and the fact that little is known about the trout resource. There is also support for conservation related regulations such as the practise of catch and release or not allowing ice fishing on some ponds.

Therefore, if IBEC wishes to apply a multiple use policy to the Indian Bay watershed which would include logging, mining and cabin development, IBEC should address the issue of protecting the trout resource first. The message should convey

information on research regarding the trout stocks, as well as information on the management measures to be applied and the expected outcome of these efforts.

5.3.4 Theme: Management

5.3.4.1 Perception of the condition of the trout resource

There were six statements included to explore the perception of the condition of the trout resource. Only one (as noted) was asked of all respondents, and the remaining five were answered by anglers only:

- More **biological** information is needed in order to manage the trout in Indian Bay more effectively. (All respondents)
- The trout **population** is the Indian Bay watershed has decreased.
- It is important to **increase** the trout population.
- Very **little is known** about the trout population of the Indian Bay watershed.
- The trout population in the Indian Bay watershed is **vulnerable** and can be easily over fished.
- I would like to have a variety of different **angling** opportunities in the Indian Bay.

For **biological**, five 'All' statements accounted for only 19% of total variance: **guiding**, **mining**, a negative predictive relationship with **drive**, and positive again with **no cabins**, and **attraction**. Two 'Angler' statements accounted for 22% of total variance: **learn** and **vulnerable**. Nearly 56% of all respondents agreed (34% strongly agreed), and only 7% disagreed. A large percentage (37%) were ambivalent, which indicates that they did not have strong convictions regarding this statement and could be open to persuasive messages.

For **population** three 'Angler' statements accounted for 19% of total variance: **vulnerable, increase** and **no ice.** Four 'All' statements accounted for 15% of total variance: **no restrictions, pond remote, biological** and **manage**. More than 54% of anglers were in agreement (38% strongly agree) and 39% were ambivalent, therefore possibly open to other persuasive influences.

For **increase**, three 'Angler' statements accounted for 24% of total variance: **learn, scenery** and **population**. Three 'All' statements accounted for 12% of total variance: **pond remote, recreational** and **no road**. There was overwhelming angler support for **increase** with 90% of anglers agreed (72% strongly agreed). Therefore, these belief structures must contain important values for the people of the Indian Bay area.

For **little known**, two 'Angler' statements accounted for only 7% of total variance: **vulnerable** and **see mine**. One 'All' statement accounted for 4% of total variance: tourists. Only 24% of anglers agreed with **little known**, 16% disagreed and an overwhelming 60% were ambivalent. When anglers were asked whether there should be a minimum size limit, 81% agreed; and when asked about a maximum size limit, 65% disagreed. Also, 60% of the local anglers indicated that small fish should be released, and older fish should be kept. They explained at one of the Ecosystem Corporation meetings that local people felt that this would allow the young fish to become more abundant. The provincial biologist pointed out that the larger fish were the spawning fish, and they were more important to the restocking of the Indian Bay watershed. While

anglers do not express a concern about the lack of knowledge about the trout resource, their responses indicate that their preferred practices are selected in ignorance.

For **vulnerable**, seven 'Angler' statements accounted for 47% of total variance: **regulations, learn, population, see mining, traditional**, and **little known**. Five 'All' statements accounted for 30% of total variance: a negative relationship with **no restrictions**, positive relationships with **minepop, biological, tourists** and **recreational**. **Vulnerable** had strong support with 73% of anglers in agreement (50% strongly agreed); therefore, exhibiting another influential underlying belief system.

For **angling**, four 'Angler' statements accounted for 22% of total variance: **checkpoint, hearlog, think**, and **traditional**. Five 'All' statements accounted for 25% of total variance: **manage, attraction, go anywhere, hear mine** and pond remote. Anglers indicated 50% agreement (28% strongly agree); however, 46% were ambivalent and therefore potentially influenced by persuasive communications. This might be somewhat explained by the fact that when anglers were asked about their reasons for fishing, 57% indicated that they caught trout to eat (30% indicated this motive as very important).

If IBEC is proposing new trout management initiatives in the Indian Bay watershed, local support would be essential to ensure voluntary compliance in such a large geographic area. This cooperation would be enhanced if the local people believed that the management objectives served were realistic based on their own perception of the condition of the trout resource. There was overwhelming support (90%) to increase the

trout population. While there were no significant predictive relationships, the most important related statements stressed the need to learn what people were willing to do to enhance the trout resource that they believe has declined. There was also a relationship with the recognition of the importance of scenery to the angling experience.

Respondents indicated a strong concern (73%) that trout stocks were vulnerable to over fishing. The underlying attitude/belief structure indicated concern with the impact of mining on trout which they believe to be declining (**minepop** - 52% agreed that mining affects the trout population), the need for regulations to enhance angling and control road and cabin development, plus the need to learn what people are willing to do in order to have a healthy trout population. Respondents agreed that more biological information was needed for management (56%), and that the trout population has decreased (54%). Yet for both these beliefs, there was a considerable number of respondents who where ambivalent (37-39%). Anglers made it very clear that they were uncommitted to the belief that little is known about the trout resource (60%), and this statement had almost no relationship at all with the other survey statements that could provide an understanding of this high degree of doubt. In summary, respondents want to increase the trout population, but they do not think that more scientific knowledge about the trout resource is needed in order to achieve this.

5.3.4.2 Consultation in resource management

There were only three statements included regarding consultation. One statement was answered by all respondents, and two were answered by anglers only:

- People who use the Indian Bay watershed should have a say in managing the trout fishery (**Manage**). (All respondents)
- It is important to learn what people **think** about trout in the Indian Bay watershed.
- It is important to **learn** what people are willing to do in order to have a healthy trout population.

For **manage**, five 'All' statements accounted for only 11% of total variance: **go anywhere, recreational, tourists, pond remote** and **development**. Four 'Angler' statements accounted for only 12% of total variance: **angling, scenery, biological** and **traditional**. Most respondents (57%) of all respondents agreed (34% strongly agreed) and only 11% disagreed. More than a third (34%) were ambivalent, and therefore somewhat open to persuasive messages. For **think**, four 'Angler' statements accounted for 41% of total variance: **learn, scenery, catch** and **hearlog**. Four 'All' statements accounted for 26% of total variance: **biological, manage, pond remote** and **attraction**. Consultation was strongly supported by anglers with 73% agreement with **think** (59% strongly agree). For **learn**, four 'Angler' statements accounted for 46% of total variance: **think, vulnerable, increase** and **checkpoint**. Six 'All' statements accounted for 36% of total variance: **pond remote, biological, minepop, attraction, manage** and **no cabins**. Consultation was strongly supported by anglers with 84% agreement with **learn** (62% strongly agree).

On the other hand, anglers strongly agreed that it is necessary to learn (**learn**) what people are willing to do to enhance the trout resource (84%), and to learn what people think (**think**) about the trout (73%). While these two statements obviously had

reciprocal predictive relationship, the associations with other statements in the survey were quite different. For **learn**, there was concern about the vulnerability of the trout to over fishing that needs to be increased, and a willingness to have a mandatory checkpoint where all anglers would report. As well there was a strong connection with keeping some ponds remote, getting more biological information, a concern about the impact of mining on trout, support for the value of the trout as a tourism attraction, recognition of the need for users of the watershed to participate in management, and support for a no cabin development policy.

For **think** the predictive relationships were with the value of scenery to the angling experience, support for catch and release regulations, and a concern that hearing logging activity would be a deterrent to fishing. There was agreement that the people who use the resource should also participate in managing the watershed (56%). There was no strong underlying belief structure associated with this statement.

In terms of who should manage the trout resource, the questionnaire asked all respondents to select one of a list of alternatives. 'All' respondents indicated a clear preference for a partnership between the provincial government and a community group (38%) first, and inter-governmental committee second (21%) and a corporation elected from communities adjacent to the watershed came third (16%). This was supported more by non-anglers than anglers. Then came 'Anglers' (10% - mostly angler supported), the provincial government (8% - again more angler support) and finally only 2% supported community control (supported more by non-anglers). Obviously, the respondents did not

wish to have either total government control or total citizen or corporate control, but rather, they supported a cooperative partnership. This arrangement offers the opportunity to formalize the consultation that the respondents are seeking in the development of the management plan for the land and resources of the Indian Bay watershed.

6.0 Conclusions

6.1 Introduction

The attitude/belief statements applied in the Indian Bay survey were used to (1) define the cultural value context of the Indian Bay communities, and (2) to describe predictive associations between attitudes and beliefs for the purposes of identifying planning issues and designing persuasive communications to achieve management objectives. The Cultural Paradigm model was applied to describe the value disposition of the communities. This type of research is useful to resource managers in order to gauge the level of receptivity and cooperation in the communities for new approaches to management.

Using the Theory of Reasoned Action, it was also possible to identify the underlying attitude/belief structures associated with the attitude and belief statements in the survey instrument. The results of the attitude survey provided a profile of the values of the communities adjacent to Indian Bay watershed, those that are strongly held and those that are vulnerable to persuasion. The underlying attitude/belief structures can provide direction to the key issues that managers need to address in educational or other persuasive messages aimed at changing these attitudes/beliefs. The attitude/belief statements were also categorized by theme: access, development, and management of the Indian Bay watershed. For each theme, the underlying attitude/belief structures were examined to identify key issues to be addressed in persuasive communications directed at issues in each theme. This is useful to resource managers who need to address these

issues in their management plans if they are to achieve specific management goals that might be controversial to the local people. This research assists managers to develop targeted messages designed to persuade the communities that their concerns were addressed.

6.2 Cultural Paradigm Results

The results of the Cultural Paradigm research using principal component analyses indicated that the belief structures did not fall exclusively into any one category of the New Environmental Paradigm of "Humanity oriented", "Man over Nature", and the "Limits to Growth" value systems (Albrecht *et al.*, 1982). There were three principal component analyses conducted to explore the cultural value system of the respondents.

The first analysis involving all respondents resulted in a combination of internally consistent values that could best be characterized as 'Humanity-oriented' or 'homocentric'. The support for the economic development of the sport fishing sector and encouraging more people to fish, and acknowledgement that more biological information is needed to manage the fish resource, could be characterized as managing the resource with the objective of putting the interests of the greatest number of people first (homocentric value). It could also be interpreted to be somewhat 'Individual-oriented' as this would involve Van Liere and Dunlap's approach putting 'Man over Nature' (Eagly and Kulsea, 1997). However, Component two (anti-mining) and Component three (restricting cabins) indicate more of a "Limits to Growth" approach. The remaining three Components which had no internal consistency reflected 'Individual-oriented' values.

The second principal component analysis involved angler responses to statements only given to anglers. Only four Components emerged and these also resulted in an interpretation that favoured a 'Humanity oriented' value system somewhat modified by 'Individual-oriented' values. For example, the denial of the traditional right to fish anywhere combined with support for regulations in both general and specific terms, would indicate the interest in maximizing the resource for all users not just for oneself, i.e., homocentric values (Eagly and Kulsea, 1997). This should be positive to resource managers wishing to impose certain regulations, yet these should be done with public involvement. These can also be interpreted as measures which assert Van Liere and Dunlap's 'Man over Nature' values. Unlike the development orientation of the first principal component analysis, these regulations are aimed at protecting the fish resource which reflects Merchant's 'Whole earth/ecosystem oriented' value system (Eagly and Kulsea, 1997) which would be an eco-centric approach seeking to find Van Liere and Dunlap's 'Balance of nature'.

The third principal component analysis was undertaken for anglers responses only to a select number of variables taken from both sets of statements. This allowed for the regulatory statements to be considered in the same analyses as the economic development statements. In this scenario, the 'Individual-oriented' values predominant in the first Component which indicated that development was a deterrent to selecting an angling destination. These statements which were primarily concerned with the recreational fishing experience were all very egoistic values according to Stern (Eagly and Kulsea,

1997). Three statements included in Component one provide some modifying effect with 'whole earth' or'Balance of Nature' values by expressing concern for the impact of mining on the trout population, the fact that little is known about the resource and a concern about tourists over fishing the resource. Stern's egoistic values (Eagly and Kulsea, 1997) are further reinforced in Component two which consists of the public consultation values and to go anywhere and fish anywhere in the watershed. Generally, the balance of values for communities in the vicinity of the Indian Bay watershed could be characterized as 'Humanity-oriented' with greater influences from 'Individually-oriented' values, as compared to 'Whole earth/ecosystem-oriented' values.

A comparison of the three principal component analyses reveals that the more direct personal statements and the more general, broad statements received the strongest reaction from respondents. The emphasis on egocentric values would be consistent with the historical reliance on the land for subsistence (see Chapter 2). The support for general, broad statements that are focussed on economic development ('Humanity oriented) could be attributed to the high level of unemployment and need for economic development in the area (see Chapter 2). The generally lower concern about the condition of the trout stocks (constituting 'Whole earth/ecosystem oriented values) would be consistent with the history of over fishing which caused the decrease in both size and numbers of trout in the Indian Bay watershed (Wicks, 1996).

The survey results provided 486 completed surveys of which 216 were non-anglers and 270 were anglers. This would appear to be a lower level of participation as

compared to the rest of the province based on the Canadian Wildlife Service reports (Filion, 1996) which indicate proportionately a much higher number of anglers per capita in the Newfoundland population (see Chapter 2). Therefore, the individualistic values expressed by the anglers need to be addressed carefully in management proposals designed to accommodate or promote economic development of the sport fish resource. Overall, the lack of a clear distinction in the results amongst the three value categories, Humanity-oriented, Individually-oriented and Whole-earth/ecosystem oriented, would suggest that the attitudes and beliefs of respondents were not polarized. Therefore, the use of educational messages would probably be effective in this cultural value environment.

6.3 Theory of Reasoned Action Results

6.3.1 Approach

The Theory of Reasoned Action is primarily concerned with identifying the Components underlying the formation and change of behavioural intentions (Fishbein, 1967). The key to developing a successful intervention, or persuasive communication, is by identifying and examining the cognitive structure of behavioural beliefs and evaluations underlying specific attitudes. To do this, the manager needs to know the direction and strength of commitment to key beliefs or attitudes and their underlying cognitive structures (or predictive relationships with determinant attitudes and beliefs). This analysis was conducted through Pearson correlation and step-wise linear regression to provide the attitude/belief structures that, in part, underlie the attitudes and beliefs held

by the residents of the Indian Bay area. These underlying cognitive structures are particularly important as this information should provide some insight into the content of the persuasive message. Fishbein and Ajzen (Petty, 1981) state that information is the essence of the persuasion process, however, they found that message content had been largely overlooked in communications theory. The results of this research should assist the managers of the Indian Bay watershed in the development of persuasive messages that facilitate achieving the objectives of their management plan.

6.3.2 Opportunities for persuasive communication summarized by strength of response to attitude and belief questions.

The results of the attitude and belief responses provide a profile of the values held by the Indian Bay communities and reveals opportunities for persuasive communication. The strongly held beliefs (where agreement or disagreement is greater than the sum for the neutral and opposing views) are more difficult to influence and perhaps represent more deep-seated cultural values considered to be representative of the prevailing attitudes and beliefs. The ambivalent beliefs and attitudes (where slightly agree, neutral and slightly disagree totals were greater that either the agree or disagree) offer the greatest opportunity for persuasive communications due to the lack of commitment to a strong position regarding the statement. These beliefs are potentially vulnerable to persuasion. To a lesser degree, there is further opportunity for persuasive communications for those statements where there was some agreement or disagreement, however, there were over 30% of respondents were ambivalent.

6.3.2.1 Firmly-held attitudes and beliefs.

All respondents indicated overwhelming support for the general broad economic development statements, particularly tourism development, and the importance of keeping some ponds remote (>80% agreement). Components influencing these attitudes/beliefs include the promotion of recreational sport fish development through increased guiding services and encouraging more people to fish in the watershed. Ponds would be kept remote through the control of road and cabin development, both control measures were supported by respondents. Therefore, if the Indian Bay Ecosystem Corporation wishes to promote greater support for sport fish development, they would have to address concerns related to guiding and encouraging more people to fish (60%). Both of these statements had a strong ambivalent response based on the concerns regarding restrictions to access within the watershed and the concern about tourists catching their fish if too many people were encouraged to fish in the watershed. Educational messages would have to address these issues in order to create a receptive environment for new fishing regulations related to outfitting development.

All respondents indicated lesser (52%-65% agreement) but still strong support for the control of vehicular access and cabin development in the watershed, consultation with users of the watershed, the need for more biological information, and the concern about potential impacts of mining development on the trout resource. The underlying belief structure reinforced support for keeping ponds remote through control of roads and cabins, a concern for the potential impacts of development on the environment, and

interestingly some support for guiding. There is a general consistency in attitude/belief relationships that complements the Indian Bay Ecosystem goals to introduce more controls in the watershed.

Anglers indicated very strong support for statements for personal angling satisfaction and consultation values, such as, increasing the trout stocks (90%,) in learning what people would do to manage the stocks effectively (84%), and believed that scenery was important to the angling experience (82%). The most important predictive association with these beliefs was public consultation with further underlying associations with beliefs supporting the need to increase the trout stocks, that the trout stocks were decreased through over fishing, and the belief that scenery is important to the angling experience, and willingness to comply with a checkpoint on access roads.

Anglers indicated lesser (54% - 73%) but still strong support for voluntary reporting to a checkpoint by all anglers which is consistent with their equally strong support of the beliefs that trout numbers have declined and they are vulnerable to over fishing. Anglers also strongly believe that we need to know what people think about the trout stocks in order to manage them more effectively. These results indicate that controls on human activity are supported. While trout decrease in population is acknowledged, the support for monitoring anglers would suggest a recognition of human impact on the stock. These values were associated with the concern for over fishing, support for regulations to increase angling opportunities, and support for consultation. This underlying attitude/belief structure would indicate that the recreational fishing

measures supported by anglers are motivated by personal interest in maximizing their angling experience combined with an awareness that over fishing by all of them is part of the problem for declining fish populations. This awareness provides a somewhat receptive atmosphere for management measures to enhance stocks which is an important component of the satisComponenty angling experience of the local angler. These measures do not necessarily include regulations geared towards the resource product needed by outfitting operations. The success of these measures will depend on the level of local participation in developing them as anglers have indicated a strong interest in consultation.

There were no strong beliefs regarding specific economic development or management statements for either group.

6.3.2.2 Ambivalent attitudes and beliefs vulnerable to persuasive communication.

The statements with ambivalent responses present an opportunity for managers to apply persuasive communications to change the underlying attitudes and beliefs which in turn might influence determinant attitudes. The statements dealing with specific developments and specific regulations offer the greatest potential for persuasive communication. All respondents were decidedly uncertain about whether cabin development caused damage to the environment or whether a policy of no more cabins should be applied. This could be attributed to the fact that recreational cabins are part of a way of life and the respondents consider this type of development as part of the outdoor landscape of Newfoundland. The underlying associations included the belief in being able

to go anywhere in the watershed and maintaining the option for future mining development. Overall, respondents were uncertain about allowing mining development. This could be attributable to the high rate of unemployment and obvious need for any economic development.

Respondents were also quite ambivalent about allowing outfitting development or encouraging policies in support of developing trophy size trout to attract sport fishermen, and they were very uncertain (52%) about whether to encourage more people to fish at all. These statements were associated with the concern that a no cabin policy might be an outcome outfitting development, the concern regarding over fishing by tourists and the potential for access restrictions that would affect local residents freedom in the watershed. Therefore, the Indian Bay Ecosystem Corporation would have to address the issue of local versus outfitting use of the fish resource if they want to promote the economic development of the sport fish resource.

Anglers indicated a significant lack of commitment to further scientific research (60%). The underlying associations were with promoting guiding and allowing mining in the watershed. Therefore, if a research agenda is to be encouraged, messages regarding the impact of increased fishing pressure and the impact of development on the resource (that is, threats to the viability of the population) would foster support for more research. Anglers were not convinced that mining and logging activities were a deterrent to angling activity. They did not think that the anglers have a traditional right to fish anywhere, or that some ponds should be designated for fly fishing only, catch and release

only or closed to ice fishing only. These beliefs can be explained by the concern for over fishing combined with the fact that the heaviest fishing occurs in the winter when snowmobiles provide easier access into the watershed. Therefore, while no ice fishing might be a very effective conservation measure, it might also mean that these anglers won't have the opportunity to fish in the area at all.

Overall, these results indicate that for all development initiatives, whether recreational cabins, recreational fishing or industrial development, the Indian Bay respondents had no fixed position. Moreover, the concept of the traditional right of access for fishing anywhere in the watershed is also not a fixed belief.

6.3.2.3 Statements potentially vulnerable to persuasive communications

The third category consisted of beliefs which had some agreement or disagreement, however, there were over 30% of respondents indicating ambivalence. This offers some opportunity for persuasive communications. All respondents supported the current open access (go anywhere) in the watershed (42%) This value was influenced predominantly by beliefs in the traditional access to fish anywhere, no closure of the ice fishing season, and a desire for a greater variety of angling opportunities. Therefore, if the management plan addressed these issues of access to the land and fish resources for the watershed, then the support for the traditional right of access would be diminished.

There was support for increasing guiding activity, yet respondents were concerned about tourists taking their fish. Unfortunately, the results of the regression analysis did not provide an underlying attitude/belief structure that might provide insight into these

apparently contradictory beliefs. Research into different techniques may be needed in order to explore this further.

For the statements provided to anglers only, the results revealed anglers wanted a variety of angling opportunities, they supported regulations, and the presence of cabin development had little impact on choice of angling destination. The primary underlying association included support for angling regulations and consultation, with a minor undercurrent of support from traditional access to angling values and a concern about over fishing by tourists. The general consistency between the strongly held beliefs/attitudes and the underlying beliefs/attitude structure indicates that there is a potentially cooperative atmosphere for initiating regulatory controls related to local angling needs.

6.3.3 Opportunities for persuasive communication summarized by theme

6.3.3.1 Access theme

Under the theme of access, 42% of respondents still supported the concept of being able to go anywhere in the watershed. As 40% of respondents were neutral, they could perhaps be persuaded to disagree by addressing the underlying values associated to the strongly held beliefs to keep some ponds remote and not to develop more roads. Therefore, the messages would address the impact on the environment by vehicular access and cabin development in terms of increased traffic and other possible developments, that combined, would affect the scenery in the watershed.

Regarding access to the fish resource, the proposal for regulatory controls was associated with access into the watershed and opportunities for cabin development. Both are issues that can easily be resolved in a management plan. As well, the mandatory checkpoint was supported only with respect to controlling access to the trout resource. This indicates that respondents want to know more about what anglers are reporting regarding their harvesting activity and their observations on the condition of the resource. Anglers were not ready to embrace any specific management regulation. The regression analysis did not reveal any influential underlying beliefs that might allow for further understanding of the motivations behind this ambivalence. On the other hand, there was support for regulations to increase angling opportunities which suggests that perhaps the other measures are either not perceived as being effective in this regard or might produce a situation or product that does not suit what the local angler wants. Respondents were also concerned about the impacts of people and development on the health of the trout resource, and they were supportive of public consultation. Therefore, if managers are seeking to introduce management measures affecting access, a consultation process would be necessary to gain local cooperation.

6.3.3.2 Development theme

For the development theme, respondents overwhelmingly supported general sport fish development concepts. These strong general development beliefs were influenced by the underlying predictive association with encouraging more people to fish, however, in turn, this belief was associated with concerns about tourists over fishing the resource and

limitations on local access into the watershed. This hierarchy of predictive associations might explain why the strong general statements did not translate into support for specific development options. In fact the only economic development that was supported was recreational guiding and there was also considerable ambivalence due to the need for more biological information about the trout and the implications for local access in the watershed.

Respondents disagreed with allowing outfitting development. One of the underlying factors was the concern that a 'no cabin development' policy would be implemented in areas where outfitting takes place. In terms of development, respondents indicated that their primary concern was with regard to the impact of the development, such as increased access, on the environment or the health of the trout resource.

Despite the importance of scenery to the quality of the angling experience (82%), development did not appear to be an insurmountable deterrent to the choice of an angling destination, with highest scores for ambivalence towards all intrusions, (although there was agreement for logging and mining and disagreement regarding cabins).

6.3.3.3 Management theme

For the management theme, anglers were overwhelming in their wish to see the trout population increase (90%), and strongly believed in the vulnerability of the resource to over-fishing (73% agree). Anglers wished for a variety of angling opportunities (50% agree) and anglers indicated no strong feelings regarding a lack of knowledge about the trout in the Indian Bay watershed (60% neutral). All respondents supported the general

statement regarding the need for more biological information in order to manage the trout more effectively (56% agree/37% ambivalent). This support was motivated by the desire for a greater variety of angling opportunities, but more importantly, support for regulations that would enhance angling opportunities, and the wish to be involved in management of the resource.

Another example of the application of the persuasive communications approach is with respect to the local understanding of the condition of the trout stocks. While 60% of the respondents are neutral as to whether little is known about the trout stocks, and approximately 56% believe that more biological information is needed for effective management; 73% agree that the trout are vulnerable to over fishing. This would indicate that the local residents are more concerned about what people are doing to the resource than they are about the ability of the watershed to produce the trout. Based on these results, it would appear that if IBEC is looking for support from the local people regarding scientific research, they will need to convince local residents that biological information is more important than managing the people who exploit the fish resource. It is important to note that the support for increasing the trout population and having a greater variety of angling opportunities were strongly related to the need for local consultation. If people are perceived to be the problem, then involving them in developing the solution will be an effective approach to ensuring their cooperation.

The support for consultation was high with all respondents indicating 56% support for users of the watershed to be involved in management, and anglers supporting

the need to know what people think about the trout resource (73%), and what they are willing to do to improve the trout resource (84%). However, this support for consultation does not translate into support for local control of the watershed, as 38% of respondents supported management through a partnership between the province and the communities, while only 8% supported angler control and 16% supported control through a community corporation.

6.4 Theoretical Implications

The Cultural Paradigm methodology provides a general description of the value profile of the respondents. It does not provide an understanding of the inter-relationships of the attitude/belief statements that make up the cultural profile. On the other hand, this methodology only requires a few statements to test for each of the three paradigm categories, therefore, it can be applied to a wide range of subject matter. That is, the questions can be designed to address specific questions related to an area of concern as well as represent the necessary spectrum of value statements needed to define the cultural profile. As the literature is still inconclusive as to whether the length of a questionnaire has a negative influence on the response rate (Dillman, 1978), this versatility is useful to maximize the results from a single survey instrument.

The Cultural paradigm theory states that individuals will try to reduce any dissonance in their beliefs (Albrecht, 1982). The cultural paradigm or pre-existing cultural model conditions the individual's goals and expectations and sets the filter through which new information is interpreted (Milton, 1996). The resource manager

must first address these pre-existing models before proposing new initiatives which might be inconsistent with the local pre-existing goals and expectations (Kempton, 1995). Therefore, the manager has an opportunity to influence the overall cultural model values prior to initiating new management approaches. In areas where no previous research has been conducted, this profile is useful to managers who might otherwise be working on a clean slate. The real value of the Cultural Paradigm lies in providing an understanding of the attitudinal environment that the manager is working in and providing direction for further attitudinal and educational research.

The Theory of Reasoned Action methodology was applied to find the underlying beliefs and values of key attitudes and offers an opportunity to select the most effective content for the educational or persuasive messages. The difficulty in this methodology is in the preparation of the questions or statements to be included in the survey. The process of identifying the key issues and associated values is critical to the success of this approach. The researcher needs to invest considerable time in the pre-questionnaire stages to ensure that the survey is sufficiently focussed to produce results that are useful for interpretation. Regardless of statistical analysis, the predictive relationships between value statements must make logical sense in order to be meaningful. The Theory of Reasoned Action approach should address the concern of statements being included in a 'shot gun' or arbitrary manner into the survey. Only the salient attitudes and beliefs (Eagly and Kulsea, 1997) should be included in order to develop a meaningful attitude/belief hierarchy.

The content of a persuasive message is limited in terms of the number of concepts that can be included before the message loses it's effectiveness. By defining the underlying attitude/belief structures having a predictive relationship with key determinant beliefs and attitudes, it is possible to target messages toward the most influential values. This approach offers the manager an opportunity to develop persuasive communications to reinforce values supporting the manager's objectives. The manager has the opportunity to address, in advance, the concerns underlying the values that oppose the manager's objectives. This approach allows the manager to develop a management strategy that combines education, consultation, and persuasive communication which should ultimately result in informed public decision making.

6.5 Conclusion

Overall, the people in the communities adjacent to the Indian Bay watershed overwhelmingly supported economic development and felt that the recreational fish resources of the Indian Bay watershed were important to tourism development. How the resource managers are to achieve this goal is not clear given that the people have also indicated ambivalence towards specific outfitting development and recreational fish regulation options presented in the survey. This inconsistency between a strongly held general belief and support for activities related to this belief was observed by Finger (1994) when he found strong environmental protection beliefs were weakly correlated with environmentally friendly behaviour.

Yet local residents do support control over vehicular access and development in the watershed. While they still somewhat support the notion of being able to go anywhere in the watershed (but not by vehicles), but they do not support the notion of being able to fish anywhere in the watershed. This would indicate that the traditional open access attitude is not a firmly held belief that over-rides all other interests in the watershed. In fact, the role that this value played in the attitude/belief structures indicated a logical consistency between cognition, affect and conation (Ajzen, 1988; Eagly 1993). An example of this hierarchy was provided in chapter 4. The survey results provided similar attitude/belief structures exhibiting this logical consistency, for example:

Dependent Statement: The recreational trout fishery of Indian Bay watershed could become an important part of the local economy.

Statement 1: Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.

Statement 2: Recreational guiding services should be increased in the Indian Bay watershed.

Statement 3: We should encourage more people to fish in the Indian Bay watershed.

Statement 4: Cabin development should be restricted to a few select areas.

The logical consistency of the predictive statements must then be assessed against their own individual responses which reveals that there is ambivalence about increasing guiding services and encouraging more people to fish. Eagly and Kulsea (1997) stated that a successful intervention in the development of public opinion is through the

identification and examination of the cognitive structure of beliefs, evaluation and motivation. Therefore, in order for managers to promote support for the dependent statement, they must address the issues that erode support for the predictive statements, in particular statement 2 and 3. Statement 4 was supported by all respondents, therefore it is not necessary to target this issue in the persuasive communications.

Overall, the results reconfirmed the profile provided by Hill (1984) on the value of wildlife to Newfoundlanders whereby personal and utilitarian values and provincial economic values are given priority over environmental/wildlife conservation. The key difference is the greater willingness of the people in the Indian Bay area in 1997 to accept regulatory controls. These values continue to form the pre-existing cultural value model (Kempton, 1995) for the Indian Bay communities. The results of the analysis for the Cultural Paradigm theory revealed that the primary factors which explained the greatest common source of variation for all respondents were economic development interests, including tourism, recreational fishing, outfitting, guiding services, encouraging more people to fish (Humanity oriented values). These results would support Noe and Hammitt's research (1992) which stated that increased relevance (unemployment) created motivation for respondents to evaluate the consequences. At the same time, anglers put greater value on individualistic objectives when it comes to the angling experience. The results also support the observations made by Manfredo *et al.* (1992) that attitude-behaviour relationships would be stronger with a higher level of direct experience. This was evident from the high level of recreational participation in the Indian Bay watershed

and the support for personal satisfaction in the angling opportunities (Individualistic values).

The results indicate that there are significant opportunities for persuasive communications on the part of IBEC to influence ambivalent attitudes in favor of regulatory and development initiatives that could achieve IBEC goals. There exists a generally open atmosphere of potential cooperation provided that the local residents are consulted in the management planning process and that the underlying concerns regarding access to the land and resources of the watershed are addressed.

It can be concluded that there was no strong support for traditional open access, it was a sub-theme found in the predictive relationships of key underlying attitudes. Nonetheless, as Omohundro (1994) points out, "Newfoundlanders have always put up a stiff resistance when their right to the commons was threatened." Subsequent events leading up to the proposed provincial 'Outdoor Bill of Rights' would suggest that the emotional response to any threat to this value should not be underestimated. Therefore, managers need to ensure that they address the various aspects of the traditional access issue in their day to day communications. Fedler and Ditton (1994) concluded that greater understanding of the subject matter leads to greater motivation for evaluation, that in turn results in greater attitude-behaviour consistency. Therefore, it is important that managers in the Indian Bay area act upon the primary recommendation of the study, to consult with their public in a meaningful and consistent manner in order to prevent emotionally charged conflicts that undermine rational policy development.

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Appendix One: Summary of interviews with representatives of Key Management Agencies involved with the Indian Bay community watershed management project.

Economic Recovery Commission (ERC)

Alastair Allan, Consultant; and, Mr. Michael Doyle, Senior Policy Analyst.

The primary goal of the ERC was to find a vehicle to generate/redistribute economic wealth in rural Newfoundland. With all the primary resources exhausted, the last component of the 'economic' paradigm was yet to be really exploited - the land. The term 'recreational estate' was coined by the ERC in their search for recreational resource management models. They fully supported the concept of 'user pay' fees, and delegation of provincial authority to a local (community) management board. Information needed: To test public acceptance of the Indian Bay proposal as originally articulated by the ERC.

Goverment of Newfoundland

Tourism Division: Mr. Mike Joy, Director.

Mr. Joy's division is responsible for the promotion and development of the outfitting sector in the province, both consumptive and non-consumptive. The range of services include business development assistance, research assistance from both a technical and market analysis perspective, plus, access to various federal/provincial funding sources. Mr.Joy's approach was less of a exploration into the tourism development opportunities, than an inquiry into whether the proposal indeed had any of the potential claimed by its proponents. He also questioned the motives of the proponents, and their ability to 'deliver' if the requested authorities were indeed delegated to the Committee. His critique was based on past experience with rural Newfoundland's non-environmentally sensitive track record, particularly the older generation which would have been responsible for 'fishing out' the area. Information requested: Number of fish caught and how they were used (subsistence/black market, etc.) - note that this information is not gathered by the fisheries and wildlife agencies for trout. Would the residents accept a restriction to this freedom?

Lands Branch: Mr. John Power, Director, Land Management Division.

The Lands Branch developed a 'Crown land allocation plan' for the Indian Bay watershed. An internal process, the Lands Branch is challenged by this opportunity to include the Development Association in the planning process. Public participation in not a requirement in the Crown lands planning process, hence, new ground is being broken with this Plan. Information requested: A measure of public acceptance of user fees to facilitate monitoring, enforcement and resource rehabilitation efforts within the project area; and, acceptance of 'community' management.

Interdepartmental Land Use Committee.

This source was used to summarize the concerns expressed by the following agencies to the proposal. Time constraints limited the opportunity to interview each agency.

Water Resources: Concern over development review and approval process, and environmental monitoring;

Wildlife: Concern over access to Crown land; objected to any suggestion of delegation of enforcement responsibility, much less authority;

Mines & Energy: concern about possible limitations on mining exploration activity for unknown potential sites;

Forestry companies: would like to participate in planning process in order to priorize areas of harvesting potential in conjunction with Committee concerns for area;

Dept. of Fisheries & Oceans: very willing to delegate responsibility for monitoring and enforcement to a duly constituted community group;

The Indian Bay Ecosystem Corporation: Barry Wicks, Project Manager, and the executive of the IBEC.

The Committee had conducted a survey to determine the level of use of the watershed (1992- results listed above in Section 1.0). They have no intentions of undertaking further survey research, however, they would appreciate any additional information that would further their cause. They had no experience in survey preparation, administration, much less data manipulation and presentation. Correspondingly, they did not have any specific data request. The priority issues on their agenda include:

- continued biological research
- control of fish harvest
- control of land allocation for any development
- defining an outfitting operation and potential markets
- how to raise money to hire employees to monitor activity in the watershed
- how to negotiate appropriate enforcement authority (and training) from the various agencies involved in enforcement
- control of all terrain vehicle (and other vehicle) access

The Committee recognized the need for progressive resource (fish stocks) regeneration to occur in order to better assess what the outfitting 'product' might be. Only then can the market analysis provide a reasonable estimation of the type of operation that could be sustained in the Indian Bay watershed. However, in order to ensure that these efforts are not impeded, the Committee is seeking control of the area. They have yet to find the answer as to what would constitute the most efficient and participatory operational model to achieve their interim and long-term objectives.

Appendix Two:
Table One: Descriptive Statistics for Questions answered by both Anglers and Non-Anglers

	Both Anglers and Non-Anglers			Anglers			Non-Anglers		
Statement	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
Tourism is a valuable economic asset to the Indian Bay area.	6.99	7	.13	6.98	7	.16	7	7	-
Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.	5.92	7	1.47	5.93	7	1.43	5.9	7	1.51
Some ponds in the watershed should be kept as remote areas.	5.78	7	1.71	5.88	7	1.69	5.67	6	1.74
The recreational trout fishery of Indian Bay watershed could become an important part of the local economy.	5.65	6	1.52	5.61	6	1.51	5.69	6	1.54
More biological information is needed in order to manage the trout in Indian Bay more effectively.	5.43	6	1.63	5.33	6	1.63	5.54	6	1.64
Cabin development should be restricted to a few select areas.	5.38	6	1.92	5.3	6	2.02	5.47	6	1.79

People who use the Indian Bay watershed should have a say in managing the trout fishery.	5.32	6	1.76	5.47	6	1.71	5.4	5	1.8
There should be areas of the Indian Bay watershed that have no road access.	5.28	6	2.04	5.3	6	2.03	5.26	6	2.05
Mining will directly affect the trout population.	5.24	6	1.75	5.29	6	1.75	5.19	6	1.75
I would be concerned about too many tourists taking our fish in the Indian Bay watershed.	4.87	5	1.91	4.85	5	1.94	4.9	5	1.88
Recreational guiding services should be increased in the Indian Bay watershed.	4.69	5	2.03	4.55	5	2.03	4.85	5	2.03
People should be able to go anywhere in the Indian Bay watershed.	4.48	5	2.21	4.7	5	2.2	4.21	4	2.2
Tourists would not fish in an area where they could hear or see mining activity.	4.39	4	1.96	4.39	4	1.92	4.38	4	2.0
No more cabins should be built in the Indian Bay watershed.	4.22	4	2.05	4.09	4	2.18	4.36	4	1.87
Cabin development causes damage to the natural environment	4.18	4	2.02	4.21	4	2.11	4.15	4	1.92

We should encourage more people to fish in the Indian Bay watershed.	4.16	4	1.92	4.16	4	1.89	4.17	4	1.95
An outfitting lodge should be allowed in the Indian Bay watershed.	3.87	4	2.19	3.77	4	2.21	3.99	4	2.17
Mining should be allowed in the Indian Bay watershed.	3.56	4	2.09	3.57	4	2.09	3.54	4	2.09
I should be able to drive a vehicle anywhere I want in the Indian Bay watershed.	2.95	2	2.17	3.05	2	2.22	2.83	2	2.1
There should be no restrictions on building a cabin in the Indian Bay watershed.	2.48	1	1.98	2.47	1	2.02	2.48	1	1.95

Appendix Two
Table Two: Descriptive Statistics for 20 Questions asked of Anglers only.

Statement	Mean	Med -ian	S.D.	Strongly Agree 1	2	3	Neutral 4	5	Strongly Disagree 6	7
It is important to increase the trout population.	6.51	7	1.00	1%	-%	1%	4%	4%	18%	72%
It is important to learn what people think about trout in the Indian Bay watershed.	6.36	7	1.07	3%	-%	2%	7%	13%	14%	59%
The scenery is important to the enjoyment of a fishing experience in Indian Bay	6.28	7	1.12	-%	1%	2%	5%	10%	22%	60%
The trout population in the Indian Bay watershed is vulnerable and can easily be over fished.	6.05	7	1.4	2%	1%	2%	7%	13%	14%	59%
There should be a check point on the access road into the Indian Bay watershed where everyone must report.	6.05	7	1.45	2%	2%	3%	7%	13%	14%	9%
It is important to learn what people are willing to do in order to have a healthy trout population in the Indian Bay Watershed .	5.98	6	1.33	1%	-%	1%	5%	9%	22%	62%
The trout population in the Indian Bay watershed has decreased.	5.41	6	1.68	4%	3%	4%	19%	16%	16%	38%
I would like to have a variety of different angling opportunities in the Indian Bay watershed.	5.36	6	1.43	2%	2%	2%	24%	20%	22%	28%
Different regulations are needed on different ponds in order to provide a range of angling opportunities in Indian Bay watershed.	5.04	5	1.87	7%	7%	4%	16%	18%	18%	30%
All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay watershed.	4.83	5	2.05	10%	9%	7%	14%	13%	16%	31%
I would not like to fish where I could see mining activity.	4.78	5	2.05	10%	6%	8%	21%	13%	12%	30%

I would not like to fish in an area where I could hear mining activity.	4.78	5	1.97	11% 9% 9% 18% 12% 13% 28%
Trout fishing on some ponds in the Indian Bay watershed should be catch and release only.	4.44	5	2.10	15% 8% 8% 17% 13% 17% 22%
Some ponds in the Indian Bay watershed should be managed specifically for trophy trout.	4.31	4	2.11	18% 8% 4% 20% 11% 21% 18%
I would not like to fish where I could see a clearcut.	4.29	4	1.96	12% 9% 19% 26% 14% 8% 21%
I wold not like to fish in an area where I could hear logging activities.	4.27	4	2	13% 10% 12% 29% 15% 8% 22%
Very little is known about the trout population of the Indian Bay watershed.	4.22	4	1.67	8% 8% 13% 31% 16% 14% 10%
Some ponds in the Indian Bay watershed should be closed to ice fishing.	4.19	4	2.2	19% 9% 8% 18% 12% 10% 22%
Trout fishing on some ponds in the Indian Bay watershed should be fly fishing only.	4.18	4	2.02	15% 11% 9% 23% 10% 14% 18%
I would not like to fish in an area where I could see a cabin.	3.13	3	1.95	30% 17% 10% 17% 11% 8% 7%

Appendix Two -Table Three:
Descriptive statistics for Attitude and Belief Statements for All Respondents to first 20 Questions.

Statement: People should be able to go anywhere in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	17%	8%	9%	12%	12%	15%	27%
Anglers	16%	7%	8%	10%	12%	15%	32%
Non-Anglers	19%	9%	10%	14%	11%	15%	22%

Statement: There should be areas of the Indian Bay watershed that have no road access.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	10%	5%	4%	13%	8%	16%	44%
Anglers	10%	5%	4%	12%	9%	17%	43%
Non-Anglers	10%	4%	5%	14%	8%	15%	44%

Statement: Some ponds in the watershed should be kept as remote (very difficult to access) areas.

Group	Strongly Disgree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	5%	3%	3%	9%	9%	19%	52%
Anglers	5%	4%	2%	6%	10%	18%	55%
Non-Anglers	5%	4%	3%	12%	9%	19%	48%

Statement: I should be able to drive a vehicle anywhere I want in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	41%	14%	8%	12%	6%	6%	13%
Anglers	42%	12%	7%	11%	6%	10%	12%
Non-Anglers	41%	17%	10%	13%	4%	1%	14%

Statement: Tourism is a valuable economic asset to the Indian Bay area.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All						1%	99%
Anglers							99%
Non-Anglers							99%

Statement: Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	2%	2%	4%	8%	13%	20%	51%
Anglers	2%	2%	4%	8%	14%	20%	50%
Non-Anglers	3%	1%	5%	8%	11%	21%	51%

Statement: The recreational trout fishery of Indian Bay watershed could become an important part of the local economy.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	3%	3%	4%	7%	20%	24%	28%
Anglers	2%	3%	7%	6%	19%	27%	36%
Non-Anglers	3%	3%	1%	9%	22%	22%	40%

Statement: We should encourage more people to fish in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	15%	6%	10%	26%	16%	12%	15%
Anglers	15%	6%	10%	25%	17%	12%	15%
Non-Anglers	16%	7%	10%	27%	13%	12%	15%

Statement: Recreational guiding services should be increased in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	4	Neutral 5	6	Strongly Agree 7
All	14%	4%	4%	21%	15%	16%	26%
Anglers	14%	5%	4%	23%	16%	13%	25%
Non-Anglers	14%	3%	3%	19%	14%	19%	28%

Statement: An outfitting lodge should be allowed in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	26%	7%	5%	22%	12%	11%	17%
Anglers	29%	6%	7%	21%	11%	9%	17%
Non-Anglers	24%	8%	4%	22%	14%	11%	17%

Statement: I would be concerned about too many tourists taking our fish in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	7%	8%	8%	17%	16%	15%	29%
Anglers	8%	8%	9%	14%	18%	14%	29%
Non-Anglers	7%	7%	8%	20%	13%	17%	28%

Statement: Cabin development causes damage to the natural environment.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	14%	10%	13%	18%	14%	12%	19%
Anglers	16%	9%	14%	13%	15%	12%	21%
Non-Anglers	12%	11%	12%	24%	13%	12%	16%

Statement: Cabin development should be restricted to a few select areas.

Group	Strongly Disagree 1	2	3	4	Neutral 5	6	Strongly Agree 7
All	9%	4%	3%	11%	14%	18%	41%
Anglers	11%	4%	3%	9%	14%	18%	41%
Non-Anglers	6%	4%	3%	12%	16%	17%	42%

Statement: No more cabins should be built in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	15%	8%	11%	25%	10%	8%	22%
Anglers	19%	8%	13%	20%	9%	7%	24%
Non-Anglers	10%	7%	10%	32%	12%	9%	20%

Statement: There should be no restrictions on building a cabin in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	52%	13%	9%	9%	5%	4%	8%
Anglers	53%	12%	9%	9%	3%	6%	8%
Non-Anglers	51%	14%	9%	9%	7%	2%	8%

Statement: Mining should be allowed in the Indian Bay watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	28%	9%	9%	23%	8%	12%	11%
Anglers	28%	8%	10%	21%	9%	14%	10%
Non-Anglers	28%	10%	7%	25%	8%	10%	12%

Statement: Mining will directly affect the trout population.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	4%	5%	7%	20%	12%	17%	35%
Anglers	4%	4%	8%	20%	11%	15%	38%
Non-Anglers	4%	6%	6%	21%	13%	18%	32%

Statement: Tourists would not fish in an area where they could hear or see mining activity.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	12%	8%	11%	21%	15%	13%	20%
Anglers	12%	7%	10%	22%	17%	13%	19%
Non-Anglers	12%	9%	11%	20%	13%	13%	22%

Statement: More biological information is needed in order to manage the trout in Indian Bay more effectively.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree [1] 7
All	5%	2%	4%	19%	14%	22%	34%
Anglers	4%	3%	4%	19%	15%	25%	30%
Non-Anglers	5%	1%	3%	19%	11%	21%	40%

Statement: People who use the Indian Bay watershed should have a say in managing the trout fishery.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree [1] 7
All	6%	5%	4%	13%	17%	22%	34%
Anglers	5%	5%	3%	9%	16%	25%	37%
Non-Anglers	7%	4%	5%	17%	9%	18%	30%

Statement: Who should be responsible for managing the trout in Indian Bay?
- Anglers who use the watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	13%	8%	11%	45%	12%	7%	4%
Anglers	9%	8%	10%	45%	15%	8%	5%
Non-Anglers	19%	7%	11%	46%	8%	6%	3%

Statement: Who should be responsible for managing the trout in Indian Bay?
- Communities adjacent to the watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	13%	7%	11%	40%	15%	10%	4%
Anglers	15%	6%	17%	40%	12%	8%	2%
Non-Anglers	10%	10%	5%	40%	18%	12%	5%

Statement: Who should be responsible for managing the trout in Indian Bay?
- A corporation elected from communities adjacent to the watershed.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	12%	7%	8%	28%	17%	18%	10%
Anglers	13%	7%	9%	30%	17%	16%	8%
Non-Anglers	12%	7%	6%	26%	16%	21%	12%

Statement: Who should be responsible for managing the trout in Indian Bay?
- A partnership between the Provincial government and a community group.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	9%	5%	5%	24%	17%	21%	19%
Anglers	8%	7%	4%	24%	19%	20%	18%
Non-Anglers	10%	3%	7%	25%	14%	21%	20%

Statement: Who should be responsible for managing the trout in Indian Bay?
- An intergovernmental committee with community representatives.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	12%	7%	8%	24%	18%	22%	9%
Anglers	10%	7%	8%	27%	18%	22%	8%
Non-Anglers	14%	7%	8%	21%	18%	23%	9%

Statement: Who should be responsible for managing the trout in Indian Bay?
- Provincial government.

Group	Strongly Disagree 1	2	3	Neutral 4	5	6	Strongly Agree 7
All	17%	13%	12%	31%	9%	6%	12%
Anglers	16%	10%	14%	30%	12%	5%	13%
Non-Anglers	19%	16%	9%	32%	5%	8%	11%

Appendix Three: Table One: Pearson's r value for statements answered by all respondents (N=468)

Note ^ means activity occurs in Indian Bay watershed. (*means significant .005; ** significant<.001 level)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Tourism is a valuable economic asset ...^.	1.000	.026	.017	.042	.010	.017	-.036	-.034	-.021	-.015
2. We should encourage more people to fish...^		1.000	.301**	.325**	.372**	.357**	.070	-.234**	.051	.045
3. Trout fishing ^....is an important tourist attraction ...			1.000	.255**	.549**	.176**	.075	-.064	.055	.135**
4. Recreational guiding services should be increased ^.....				1.000	.437**	.493**	.098*	-.052	.026	.123**
5. The recreational trout fishery ^... important part of the local economy.					1.000	.243**	.129**	-.113	.000	.133**
6. An outfitting lodge... allowed ^....						1.000	.054	-.155**	.073	.010
7. Tourists would not fish where they could hear or see mining activity.							1.000	.206**	.393**	.433**
8. I would be concerned about too many tourists taking fish^...								1.000	-.085	.240**
9. A Mine should be allowed^...									1.000	-.522**
10. Mining would affect trout^...										1.000

	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. Tourism is a valuable economic asset ...^.	-.002	-.015	-.032	.014	-.014	.007	.006	.007	-.029	.036
2. We should encourage more people to fish...^	.060	.043	.007	.113*	-.094*	.064	-.022	-.006	.124**	.138*
3. Trout fishing ^....is a important tourist attraction ...	.001	.094*	-.024	.097*	-.085	-.076	.056	.070	.16788	.184**
4. Recreational guiding services should be increased ^.....	-.153**	.204**	.050	-.058	.054	-.061	-.002	.108*	.047	.335**
5. The recreational trout fishery ^... important part of the local economy.	-.049	.181**	-.005	.023	-.240	-.054	.013	.078	.161**	.209**
6. An outfitting lodge... allowed ^....	.048	.009	-.050	-.003	-.101*	.059	-.055	.000	.076	.163**
7. Tourists would not fish where they could hear or see mining activity.	-.199	.066	.135*	-.033	.233**	-.071	.160*	.217**	.092*	.116*
8. I would be concerned about too many tourists taking fish^...	-.051	.042	.056	-.064	.213**	-.077	.053	.198	.107*	.082
9. A mine should be allowed^...	.233**	-.061	-.090	.083	-.154*	.034	-.090	-.125**	-.056	-.145**
10. Mining would affect trout^...	-.192**	.094*	.077	-.005	.183**	.025	.198*	.179**	.101*	.250**

	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
11. I should be able to drive a vehicle anywhere ^...	1.000	-.224**	-.163**	.284**	-212**	.288**	-.331**	-.428**	-.105	-213**
12. Cabin development ... restricted to a few select areas.		1.000	.337**	-.179**	.313**	-.312**	.183**	.266**	.035	.129**
13. Cabin development causes damage to natural environment.			1.000	-.144	-.374	-.242**	.192**	.184**	-.110*	.107*
14. People should be able to go anywhere in I.B. watershed.				1.000	-.215**.	.142**	-.064	-.061	.188**	-.098*
15. No more cabins ^...					1.000	-.203**	.134**	.185**	-.081	.182**
16. ...no restrictions on cabins^...						1.000	-.224**	-.325**	.008	-.097
17....should be areas^...no road access (difficult access)							1.000	.524	.083	.129**
18. Some ponds...kept remote...								1.000	.115*	.150**
19. People who use watershed ... say in management									1.000	.110*
20. More biological information needed for trout management....										1.000

Appendix Three:

Table Two: Pearson's r value for statements answered by all respondents (N=468)

Note ^ means activity occurs in Indian Bay watershed. (*means significant <.005; ** significant <.001 level)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
21. All Newfoundlanders have a traditional right to fish anywhere^..	.025	.125*	-.109	-.073	.066	-.060	-.037	.042	-.033	.007
22. ...important to increase the trout population.^...	.011	.026	.144*	.157*	.146*	-.020	.167**	.019	-.039	.087
23. ... The trout population in^ ...had decreased.	.001	-.120	.138*	.054	.050	-.020	.053	.077	-105	.236**
24. I would like...variety of angling opportunities^...	.020	.167**	.282**	.153*	.218**	.120	.280**	.091	-.059	.160*
25. There should be a checkpoint ^ ...where everyone must report.	-.104	.054	.182**	.255**	.249**	.112	.128*	.194**	.096	.273**
26... scenery important tofishing experience^	.116	.078	.134*	.058	.175**	.040	.178**	.063	.119	.240**
27. I would not like to fish where I could see a cabin.	-.017	-.050	.050	.034	-.047	-.039	.221**	.099	-.145*	.207*
28. ...not fish..see clear...	-.019	-.014	.025	.086	.025	.041	.283**	.188**	-.262**	.257**
29. ..not fish..see mine...	.023	.014	.093	.134*	.056	.009	.437**.	.220**	.370**	.370**
30....not fish...hear logging	-.008	.162**	.005	.104	.008	.094	.410**	.211**	.344**	.406**

	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
21. All Newfoundlanders have a traditional right to fish anywhere^..	.294**	-.012	-.123	.419**	-.140*	.205**	-.079	.053	.181**	-.066
22. ...important to increase the trout population.^...	-.186**	-.001	.063	.098	-.011	-.176**	.265**	.273**	.039	.182**
23. ... The trout population in^ ...had decreased.	-.262**	.026	.151*	.062	.171**	-.264**	.206**	.266**	.158*	.243**
24. I would like...variety of angling opportunities^...	-.007	.035	-.027	.267**	.031	-.148*	.079	.217**	.281**	.153*
25. There should be a checkpoint ^ ...where everyone must report.	-.147*	.074	.014	.061	.100	-.240**	.090	.187**	.167**	.273**
26... scenery important tofishing experience^	-.155*	.062	-.036	.079	.081	-.122	.096	.250**	.218**	.176**
27. I would not like to fish where I could see a cabin.	-.182**	.266**	.349**	-.147*	.337**	-.219**	.126*	.197**	-.009	.146*
28. ...not fish..see mining..	-220**	.123	.248**	-.088	.211**	-.138*	.147*	.242**	.100	.188**
29. ..not fish..hear mining.	-.214**	.110	.109	-.005	.133*	-.135*	.178**	.253**	.135*	.148*
30....not fish...hear logging	-.075	.068	.125	.034	.150*	.072	.125*	.206**	.136*	.228**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
31...not fish...hear mining	.012	.096	.067	.130	.032	.051	0	.123	-.347**	.367**
32. Very little is known about the trout of I.B. watershed	.016	.011	-.016	.116	.010	-.004	.145	.186	-.057	.110
33. Trout population^ is vulnerable & easily over-fished.	.073	.063	.232**	.239**	.234**	.156*	.222*	.247**	-129*	.339**
34. Different regulations are needed on different ponds ... to provide a range of angling ...	.028	.101	.255**	.291**	.149*	.209**	.168**	.194**	-.142	.346
35. Some ponds ^ closed to ice fishing	-.110	.058	.185**	.122	.215**	.179**	.179**	-.012	-.127*	.198**
36. ...some ponds .. catch & release	.036	.003	.072	.151*	.057	.117	.097	.040	-.052	.109
37. Some ponds^ managed specifically for trophy trout.	-.061	.133*	.204**	.265**	.074	.257**	.092	.094	-.074	.210**
38. ..some ponds... fly-fishing only.	.035	.058	.107	.208**	.082	.122	.135*	-.014	-.130*	.208**
39. Important to learn what people think about the trout^...	.070	.166	.199**	.181**	.190**	.161*	.159*	.137*	-.132*	.186**
40. Important to learn what people are willing to do ... for a healthy trout population.	.085	.036	.233**	.179**	.215**	.081	.276**	.112	.233**	.332**

	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
31...not fish...hear mining	-.183**	.156**	.131**	-.026	.113*	-.096*	.096*	.192**	.092*	.116*
32. Very little is known about the trout of I.B. watershed	-.093	-.039	.104	-.066	.120	-.096	-.010	..002	-.005	.169**
33. Trout population^ is vulnerable & easily over-fished.	-.261**	.145*	.120	-.061	.238**	-.383**	.162*	.268**	.012	.268**
34. Different regulations are needed on different ponds ... to provide a range of angling ...	-.163**	.141*	.122	-.093	.213**	-.220**	.152*	.362**	.114	.263**
35. Some ponds ^ closed to ice fishing	-.273**	.227**	.312**	-.242**	.269**	-.260**	.266**	.254**	.041	.231**
36. ...some ponds ..catch & release	-.272**	.121	.189**	-.038	.095	-.246**	.078	.278**	.039	.207**
37. Some ponds^ managed specifically for trophy trout.	-.254**	.205**	.236**	-.128*	.235**	-.194**	.225**	.364**	.012	.186**
38. ..some ponds... fly-fishing only.	-.243**	.179**	.278**	-.127*	.242**	-.213**	.134*	.197**	.006	.219**
39. Important to learn what people think about the trout^...	-.112	.006	-.038	.016	.049	-.163**	.057	.255**	.235**	.413**
40. Important to learn what people are willing to do ... for a healthy trout population.	-.197**	.188**	.078	.029	.232**	-.165**	.184**	.398**	.229**	.398**

Appendix Three: Table Three: Pearson's *r* value for Angler only statements (N=256) ^ means '...in the Indian Bay watershed.'

	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
21. All Newfoundlanders have a traditional right to fish anywhere^..	1.00	.025	-.107	.167**	-.011	.122	-.112	-.065	-.026	.039	-.041
22. ...important to increase the trout population.^...		1.000	.263	.249**	.268**	.359**	.029	.123	.162**	.043	.095
23. ... The trout population in^ ...had decreased.			1.000	.104	.228**	.086	.122	.201**	.106	.109	.078
24. I would like...variety of angling opportunities^...				1.000	.363**	.242**	.019	.163**	.158*	.184**	.109
25. There should be a checkpoint ^ ...where everyone must report.					1.000	.240*	.105	.154*	.136*	.019	.044
26... scenery important to fishing experience^						1.000	.040	.142*	.203**	.157*	.186**
27. I would not like to fish where I could see a cabin.							1.000	.401**	.394**	.340**	.366**
28. ...not fish..see mining.								1.000	.551**	.514**	.477**
29. ..not fish..hear mining.									1.000	.587**	.683**
30....not fish...hear logging										1.000	.829**
31...not fish...hear mining											1.000

	32.	33.	34.	35.	36.	37.	38.	39.	40.
21. All Newfoundlanders have a traditional right to fish anywhere^	-.084	-.184**	-.158*	-.266**	-.130*	-.264**	-.177**	.005	-.024
22. ...important to increase the trout population.	.002	.272**	.144*	.102	.195**	.184	.111	.276	.393**
23. ... The trout population in^ had decreased.	.166**	.329**	.256**	.273**	.220**	.276**	.185**	.144*	.229**
24. I would like...variety of angling opportunities^...	-.070	.251**	.157*	.140*	.146*	.133*	.074	.288**	.288**
25. There should be a checkpoint ^ where everyone must report.	.090	.446**	.272**	.189**	.170**	171**	.159*	.260**	.360**
26... scenery important tofishing experience^	.002	.203**	.223**	.079	.220**	.099	.084	.364**	.313**
27. I would not like to fish where I could see a cabin.	.135*	.184**	.150*	.289**	.131*	.238**	.185**	-.120	.141*
28. ...not fish..clearcut..	.173**	.253**	.205**	.349**	.295**	.251**	.235**	.177**	.153*
29. ..not fish..see mining.	.202**	.298**	.302**	.204**	.199**	.256**	.215**	.213**	.195**
30....not fish...hear logging	.150*	.173**	.228**	.174**	.101	.141*	.151*	.262**	.222**
31. ..not fish...hear mining	.152*	.204**	.246**	.161*	.096	.147*	.150*	.230**	.232**

	32.	33.	34.	35.	36.	37.	38.	39.	40
32. Very little is known about the trout of I.B. watershed	1.000	.211**	.036	.064	.098	.116	.047	.097	.036
33. Trout population^ is vulnerable & easily over-fished.		1.000	.441**	.308**	282**	.312**	.248**	.343**	.423**
34. Different regulations are needed on different ponds ... to provide a range of angling ...			1.000	.389**	.345**	.487**	.370**	.290**	.324**
35. Some ponds ^ closed to ice fishing				1.000	.233**	.455**	.378**	.212**	.272**
36. ...some ponds ..catch & release					1.000	.261**	.421**.	.290**	.257**
37. Some ponds^ managed specifically for trophy trout.						1.000	.404**	.207**	.253**
38. ..some ponds... flyfishing only.							1.000	.087	.262**
39. Important to learn what people think about the trout^...								1.000	.562**
40. Important to learn what people are willing to do ... for a healthy trout population.									1.000

Appendix Three - Table Four:
Results of Step-wise Linear Regression using statements posed to 'All respondents' and applied to 'Angler' statements. Note: All results are statistically significant at $p<0.05$.

Independent Variables:		R value	R sq.	R sq. Diff.
1.	**ACCESS THEME**			
1.1	**Dependent Variable (Statement): People should be able to go anywhere in the Indian Bay watershed.** Regression equation: Y (go anywhere) = 1.578 + 0.360 (traditional) + 0.401 (angling) + -0.174 (no ice)			
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay.	.426	.181	
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.483	.133	.052
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.510	.260	.027
1.2	**Dependent Variable (Statement): I should be able to drive a vehicle anywhere I want in the Indian Bay watershed.** Regression equation: Y (drive) = 5.403 = 0.261 (traditional) + -0.162 (vulnerable) + -0.154 (catch) + -0.133 (see mine) + -0.200 (population)			
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay.	.302	.091	.211
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.389	.151	.238
•	Trout fishing on some ponds in the Indian Bay watershed should be **catch** and release.	.423	.179	.244
•	I would not like to fish in an area where I could **see mining** activity.	.446	.199	.247
•	The trout **population** in the Indian Bay watershed has decreased.	.459	.218	.241
1.3	**Dependent Variable (Statement): There should be areas of the Indian Bay watershed that have no road access.** Regression equation: Y (no road) = 0.767 + 0.225 (no ice) + 0.454 (increase) + 0.142 (hearmine)			
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.291	.084	
•	It is important to **increase** the trout population.	.376	.142	.024

•	I would not fish where I could **hear mining** activity.	.402	.164	.018
1.4	**Dependent Variable (Statement): Some ponds in the watershed should be kept as remote areas.** Regression equation: Y (pond remote) = 0.268 + 0.361 (learn) + 0.171 (managed) + 0.234 (scenery) + 0.136 (population) + 0.095 (hearlog)			
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.399	.159	
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.472	.223	.064
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay watershed.	.499	.249	.026
•	The trout **population** in the Indian Bay watershed has decreased.	.514	.265	.016
•	I would not fish in an area where I could **hear logging** activity.	.526	.277	.012
1.5	**Dependent Variable (Statement): Cabin development causes damage to the natural environment.** Regression equation: Y (development) = 1.692 + 0.300 (see cabin) + 0.208 (fly fishing) + 0.175 (no ice)			
•	I would not like to fish in an area where I could **see a cabin**.	.363	.132	
•	Trout fishing on some ponds in the Indian Bay watershed should be **fly-fishing** only.	.444	.197	.065
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.473	.224	.027
1.6	**Dependent Variable (Statement): No more cabins should be built in the Indian Bay watershed.** Regression equation: Y (no cabins) = 0.730 + 0.332 (see cabin) + 0.283 (vulnerable) + 0.144 (fly fishing)			
•	I would not like to fish in an area where I could **see a cabin**.	.354	.125	
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.413	.171	.046
•	Trout fishing on some ponds in the Indian Bay watershed should be **fly-fishing** only.	.433	.187	.016
1.7	**Dependent Variable (Statement): Cabin development should be restricted to a few select areas.** Regression equation: Y (cabins restricted) = 2.557 + 0.199 (see cabin) + 0.129 (no ice) + 0.253 (learn)			
•	I would not fish in an area where I could **see a cabin**.	.253	.664	
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.304	.093	.029

•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.331	.110	.017
1.8	**Dependent Variable (Statement): There should be no restrictions on building a cabin in the Indian Bay watershed.** Regression equation: Y (no restrictions) = 6.178 + -0.466(vulnerable) + -0.142 (catch) + -0.138 (see cabin)			
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.386	.149	
•	Trout fishing on some ponds in the Indian Bay watershed should be **catch** and release.	.416	.173	.024
•	I would not like to fish in an area where I could **see a cabin**.	.437	.191	.018
2.	**DEVELOPMENT THEME**			
2.1	**Tourism is a valuable economic asset to the Indian Bay area.** Note: no results for step-wise linear regression.			
2.2	**Dependent Variable (Statement): Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.** Regression equation: Y (attraction) = 4.000 + 0.223 (angling) + 0.150 (regulations)			
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.281	.063	
•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.817	.100	.037
2.3	**Dependent Variable (Statement): The recreational trout fishery of Indian Bay watershed could become an important part of the economy.** Regression equation: Y (recreational) = 2.827 + 0.184 (check point) + 0.121 (no ice) + 0.183 (scenery)			
•	There should be a **checkpoint** on the access road into the Indian Bay watershed where everyone must report.	.241	.058	
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.299	.089	.031
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay.	.325	.106	.017
2.4	**Dependent Variable (Statement): An outfitting lodge should be allowed in the Indian Bay watershed.** Regression equation: Y (outfitting) = 2.696 + 0.258 (managed)			
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.249	.062	
2.5	**Dependent Variable (Statement): Recreational guiding services should be increased in the Indian Bay watershed.** Regression equation: Y (guiding) = 1.574 = 0.174 (regulations) + 0.249 (checkpoint) + 0.145 (managed)			

•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.298	.077	
•	There should be a **checkpoint** on the access road into the Indian Bay watershed.	.330	.109	.032
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.356	.127	.018
2.6	**Dependent Variable (Statement): I would be concerned about too many tourists taking our fish in the Indian Bay watershed.** Regression equation: Y (tourists) = 1.855 + 0.260 (vulnerable) + 0.163 (hearlog) + 0.161 (little known)			
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.247	.061	
•	I would not like to fish in an area where I could **hear logging** activity.	.304	.092	.031
•	Very **little is known** about the trout population of the Indian Bay watershed.	.332	.110	.018
2.7	**Dependent Variable (Statement): We should encourage more people to fish in the Indian Bay watershed.** Regression equation: Y (encourage) = 2.604 + 0.192 (angling) + 0.127 (hearlog)			
•	I would like a variety of **angling** opportunities in the Indian Bay watershed.	.171	.029	
•	I would not fish in an area where I could **hear logging** activity.	.217	.047	.018
2.8	**Dependent Variable (Statement): Mining should be allowed in the Indian Bay watershed.** Regression equation: Y (Mining) = 6.016 + -0.281 + -0.251 (hearmine)			
•	I would not like to fish in an area where I could **see mining** activity.	.370	.137	
•	I would not fish in an area where I could **hear mining** activity.	.423	.179	.042
2.9	**Dependent Variable (Statement): Mining will directly affect the trout population.** Regression equation: Y (minepop) = 0.391 + 0.299 (see mine) + 0.265 (learn) + 0.204 (vulnerable) + 0.125 (hearlog)			
•	I would not like to fish in an area where I could **see mining** activity.	.499	.249	
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.552	.305	.056
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.569	.323	.018
•	I would not like to fish in an area where I could **hear logging** activity.	.550	.336	.013

2.10	**Dependent Variable (Statement): I would not fish where I could hear mining activity.** Regression equation: Y (hear mine) = -0.491 + 0.301 (see mine) + 0.225 (angling) + 0.171 (hearlog) + 0.235 (learn)			
•	I would not like to fish in an area where I could **see mining** activity.	.464	.215	
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.515	.266	.051
•	I would not like to fish in an area where I could **hear logging** activity.	.538	.289	.023
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.552	.305	.016
3.	**MANAGEMENT THEME**			
3.1	**Dependent Variable (Statement): More biological information is need in order to manage the trout in Indian Bay watershed.** Regression equation: Y (biological) = 1.357 + 0.439 (learn) + 0.224 (vulnerable)			
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.435	.189	
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over-fished.	.472	.223	.034
3.2	**Dependent Variable (Statement): People who use the watershed should have a say in managing the trout resource.** Regression equation: Y (manage) = 1.115 + 0.267 (angling) + 0.245 (scenery) + 0.149 (biological) + 0.117 (traditional)			
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.294	.086	
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay watershed.	.342	.117	.031
•	More **biological** information is needed in order to manage the trout in Indian Bay effectively.	.365	.133	.016
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.	.390	.117	.019

Appendix Three - Table Five:
Results of Step-wise Linear Regression using statements posed to 'All respondents' and applied to 'Angler' statements. Note: All results are statistically significant at $p<0.05$.

Independent Variables:		R value	R sq.	R sq. Diff.
1.	**ACCESS THEME**			
1.1	**Dependent Variable (Statement): People should be able to go anywhere in the Indian Bay watershed.** Regression equation: Y (go anywhere) = 1.578 + 0.360 (traditional) + 0.401 (angling) + -0.174 (no ice)			
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay.	.426	.181	
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.483	.133	.052
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.510	.260	.027
1.2	**Dependent Variable (Statement): I should be able to drive a vehicle anywhere I want in the Indian Bay watershed.** Regression equation: Y (drive) = 5.403 = 0.261 (traditional) + -0.162 (vulnerable) + -0.154 (catch) + -0.133 (see mine) + -0.200 (population)			
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay.	.302	.091	.211
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.389	.151	.238
•	Trout fishing on some ponds in the Indian Bay watershed should be **catch** and release.	.423	.179	.244
•	I would not like to fish in an area where I could **see mining** activity.	.446	.199	.247
•	The trout **population** in the Indian Bay watershed has decreased.	.459	.218	.241
1.3	**Dependent Variable (Statement): There should be areas of the Indian Bay watershed that have no road access.** Regression equation: Y (no road) = 0.767 + 0.225 (no ice) + 0.454 (increase) + 0.142 (hearmine)			
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.291	.084	
•	It is important to **increase** the trout population.	.376	.142	.024

•	I would not fish where I could **hear mining** activity.	.402	.164	.018
1.4	**Dependent Variable (Statement): Some ponds in the watershed should be kept as remote areas.** Regression equation: Y (pond remote) = 0.268 + 0.361 (learn) + 0.171 (managed) + 0.234 (scenery) + 0.136 (population) + 0.095 (hearlog)			
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.399	.159	
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.472	.223	.064
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay watershed.	.499	.249	.026
•	The trout **population** in the Indian Bay watershed has decreased.	.514	.265	.016
•	I would not fish in an area where I could **hear logging** activity.	.526	.277	.012
1.5	**Dependent Variable (Statement): Cabin development causes damage to the natural environment.** Regression equation: Y (development) = 1.692 + 0.300 (see cabin) + 0.208 (fly fishing) + 0.175 (no ice)			
•	I would not like to fish in an area where I could **see a cabin**.	.363	.132	
•	Trout fishing on some ponds in the Indian Bay watershed should be **fly-fishing** only.	.444	.197	.065
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.473	.224	.027
1.6	**Dependent Variable (Statement): No more cabins should be built in the Indian Bay watershed.** Regression equation: Y (no cabins) = 0.730 + 0.332 (see cabin) + 0.283 (vulnerable) + 0.144 (fly fishing)			
•	I would not like to fish in an area where I could **see a cabin**.	.354	.125	
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.413	.171	.046
•	Trout fishing on some ponds in the Indian Bay watershed should be **fly-fishing** only.	.433	.187	.016
1.7	**Dependent Variable (Statement): Cabin development should be restricted to a few select areas.** Regression equation: Y (cabins restricted) = 2.557 + 0.199 (see cabin) + 0.129 (no ice) + 0.253 (learn)			
•	I would not fish in an area where I could **see a cabin**.	.253	.664	
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.304	.093	.029

•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.331	.110	.017
1.8	**Dependent Variable (Statement): There should be no restrictions on building a cabin in the Indian Bay watershed.** Regression equation: Y (no restrictions) = 6.178 + -0.466(vulnerable) + -0.142 (catch) + -0.138 (see cabin)			
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.386	.149	
•	Trout fishing on some ponds in the Indian Bay watershed should be **catch** and release.	.416	.173	.024
•	I would not like to fish in an area where I could **see a cabin**.	.437	.191	.018
2.	**DEVELOPMENT THEME**			
2.1	**Tourism is a valuable economic asset to the Indian Bay area.** Note: no results for step-wise linear regression.			
2.2	**Dependent Variable (Statement): Trout fishing in the Indian Bay watershed is an important tourist attraction for the region.** Regression equation: Y (attraction) = 4.000 + 0.223 (angling) + 0.150 (regulations)			
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.281	.063	
•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.817	.100	.037
2.3	**Dependent Variable (Statement): The recreational trout fishery of Indian Bay watershed could become an important part of the economy.** Regression equation: Y (recreational) = 2.827 + 0.184 (check point) + 0.121 (no ice) + 0.183 (scenery)			
•	There should be a **checkpoint** on the access road into the Indian Bay watershed where everyone must report.	.241	.058	
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.299	.089	.031
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay.	.325	.106	.017
2.4	**Dependent Variable (Statement): An outfitting lodge should be allowed in the Indian Bay watershed.** Regression equation: Y (outfitting) = 2.696 + 0.258 (managed)			
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.249	.062	
2.5	**Dependent Variable (Statement): Recreational guiding services should be increased in the Indian Bay watershed.** Regression equation: Y (guiding) = 1.574 = 0.174 (regulations) + 0.249 (checkpoint) + 0.145 (managed)			

•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.298	.077	
•	There should be a **checkpoint** on the access road into the Indian Bay watershed.	.330	.109	.032
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.356	.127	.018
2.6	**Dependent Variable (Statement): I would be concerned about too many tourists taking our fish in the Indian Bay watershed.** Regression equation: Y (tourists) = 1.855 + 0.260 (vulnerable) + 0.163 (hearlog) + 0.161 (little known)			
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over fished.	.247	.061	
•	I would not like to fish in an area where I could **hear logging** activity.	.304	.092	.031
•	Very **little is known** about the trout population of the Indian Bay watershed.	.332	.110	.018
2.7	**Dependent Variable (Statement): We should encourage more people to fish in the Indian Bay watershed.** Regression equation: Y (encourage) = 2.604 + 0.192 (angling) + 0.127 (hearlog)			
•	I would like a variety of **angling** opportunities in the Indian Bay watershed.	.171	.029	
•	I would not fish in an area where I could **hear logging** activity.	.217	.047	.018
2.8	**Dependent Variable (Statement): Mining should be allowed in the Indian Bay watershed.** Regression equation: Y (Mining) = 6.016 + -0.281 + -0.251 (hearmine)			
•	I would not like to fish in an area where I could **see mining** activity.	.370	.137	
•	I would not fish in an area where I could **hear mining** activity.	.423	.179	.042
2.9	**Dependent Variable (Statement): Mining will directly affect the trout population.** Regression equation: Y (minepop) = 0.391 + 0.299 (see mine) + 0.265 (learn) + 0.204 (vulnerable) + 0.125 (hearlog)			
•	I would not like to fish in an area where I could **see mining** activity.	.499	.249	
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.552	.305	.056
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.569	.323	.018
•	I would not like to fish in an area where I could **hear logging** activity.	.550	.336	.013

2.10	**Dependent Variable (Statement): I would not fish where I could hear mining activity.** Regression equation: Y (hear mine) = -0.491 + 0.301 (see mine) + 0.225 (angling) + 0.171 (hearlog) + 0.235 (learn)			
•	I would not like to fish in an area where I could **see mining** activity.	.464	.215	
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.515	.266	.051
•	I would not like to fish in an area where I could **hear logging** activity.	.538	.289	.023
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.552	.305	.016
3.	**MANAGEMENT THEME**			
3.1	**Dependent Variable (Statement): More biological information is need in order to manage the trout in Indian Bay watershed.** Regression equation: Y (biological) = 1.357 + 0.439 (learn) + 0.224 (vulnerable)			
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.435	.189	
•	The trout population in the Indian Bay watershed in **vulnerable** and can easily be over-fished.	.472	.223	.034
3.2	**Dependent Variable (Statement): People who use the watershed should have a say in managing the trout resource.** Regression equation: Y (manage) = 1.115 + 0.267 (angling) + 0.245 (scenery) + 0.149 (biological) + 0.117 (traditional)			
•	I would like to have a variety of **angling** opportunities in the Indian Bay watershed.	.294	.086	
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay watershed.	.342	.117	.031
•	More **biological** information is needed in order to manage the trout in Indian Bay effectively.	.365	.133	.016
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.	.390	.117	.019

Appendix Three - Table Six: Results of Step-wise Linear Regression using statements answered by 'Angler respondents' applied to statements answered by 'All respondents'. Note: All results are statistically significant at $p<0.05$.

Independent Variables:		R value	R sq.	R sq. change
A.1	**Dependent Variable (Statement): All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay.** Regression equation: Y (traditional) = 1.803 + 0.315 (go anywhere) + 0.199 (drive) + 0.168 (manage)			
•	People should be able to **go anywhere** in the Indian Bay watershed.	.416	.173	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed	.456	.208	.035
•	People who use the watershed should have a say in **managing** the trout.	.475	.226	.018
A.2	**Dependent Variable (Statement): There should be a checkpoint on the access road into the Indian Bay watershed where everyone must report.** Regression equation: Y (checkpoint) =3.324 + 0.144 (minepop) + -0.177 (no restrictions) + 0.182 (recreational) + 0.129 (biological) + 0.109 (tourists)			
•	Mining will directly affect the trout population. **(Minepop)**	.284	.081	
•	There should be **no restrictions** on building a cabin in the Indian Bay watershed.	.358	.128	.047
•	The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.	.401	.161	.033
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.426	.181	.020
•	I would be concerned about too many **tourists** taking our fish in the Indian Bay watershed.	.447	.200	.019
A.3	**Dependent Variable (Statement): Different regulations are needed on different ponds in order to provide a range of angling opportunities.** Regression equation: Y (regulations) = -0.577 + 0.308 (pond remote) + 0.204 (minepop) + 0.172 (guiding) + 0.223 (attraction) + 0.130 (tourists)			
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.361	.130	
•	Mining will directly affect the trout population. **(Minepop)**	.458	.210	.080
•	Recreational **guiding** services should be increased in the Indian Bay watershed.	.502	.252	.012
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.522	.273	.021
•	I would be concerned about too many **tourists** taking our fish in the Indian Bay.	.538	.289	.016

A.4	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be closed to ice fishing.** Regression equation: Y(no ice) = 0.987 + 0.269 (development) + -.134 (drive) + 0.271 (attraction) + -.151 (go anywhere) + 0.190 (no road) + 0.145 (outfitting)			
•	Cabin **development** causes damage to the natural environment.	.310	.096	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed	.395	.156	.060
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.444	.197	.041
•	People should be able to **go anywhere** in the Indian Bay watershed.	.471	.222	.025
•	There should be areas of the Indian Bay watershed that have **no road** access.	.495	.245	.023
•	An **outfitting** lodge should be allowed in the Indian Bay watershed.	.515	.265	.020
A.5	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be catch and release.** Regression equation: Y (catch and release) = 2.146 + 0.199 (pond remote) + -.151 (drive) + 0.196 (biological) + 0.125 (development)			
•	Some ponds in the watershed should be kept as remote areas. (**Pond remote**)	.278	.077	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed.	.323	.104	.027
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.356	.127	.023
•	Cabin **development** causes damage to the natural environment.	.377	.142	.015
A.6	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be managed for trophy trout only.** Regression equation: Y (managed) = -1.693 + 0.387 (pond remote) + 0.220 (outfitting) + 0.163 (no cabins) + 0.273 (attraction) + 0.147 (development)			
•	Some ponds in the watershed should be kept as remote areas. (**pond remote**)	.371	.130	
•	An **outfitting** lodge should be allowed in the Indian Bay watershed.	.447	.210	.080
•	**No more cabins** should be built in the Indian Bay watershed.	.493	.252	.012
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.521	.273	.021
•	Cabin **development** causes damage to the natural environment.	.538	289	.016
A.7	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be fly-fishing only.** Regression equation: Y (fly fishing) = 2.869 + 0.235 (development) + -0.163 (drive) + 0.164 (guiding)			

•	Cabin **development** causes damage to the natural environment.	.287	.083	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed.	.351	.123	.040
•	Recreational **guiding** services should be increased in the Indian Bay watershed.	.387	.150	.027
B.1	**Dependent Variable (Statement): The scenery is important to the enjoyment of a fishing experience in Indian Bay.** Regression equation: Y (scenery) = 3.759 + 0.134 (pond remote) + 0.099 (minepop) + 0.109 (manage) + 0.107 (recreational)			
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.257	.066	
•	Mining will directly affect the trout population. **(Minepop)**	.317	.101	.035
•	People who use the Indian Bay watershed should have a say in **managing** the trout fishery.	.360	.129	.028
•	The **recreational** trout fishery of Indian Bay watershed could become an important of the local economy.	.387	.150	.021
B.2	**Dependent Variable (Statement): I would not fish where I could see a cabin.** Regression equation: Y (see cabin) = .745 + 0.230 (development) + 0.180 (no cabins) + 0.154 (minehear)			
•	Cabin **development** causes damage to the natural environment.	.347	.120	
•	**No** more **cabins** should be built in the Indian Bay watershed	.398	.159	.039
•	Tourists would not fish where they could **hear mining** activity.	.425	.180	.021
B.3	**Dependent Variable (Statement): I would not fish where I could see mining activity.** Regression equation: Y (see mine) = 0.683 + 0.361 (minepop) + 0.296 (hear mine) + 0.149 (pond remote)			
•	Mining will directly affect the trout population. **(minepop)**	.475	.226	
•	Tourists would not fish in an area where they could **hear mining** activity.	.548	.300	.074
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.562	.316	.016
B.4	**Dependent Variable (Statement): I would not fish in an area where I could hear mining activity.** Regression equation: Y (hear mine) = 2.246 + 0.306 (minepop) + -.216 (mining) + 0.167 (biological) + 0.122 (tourists)			
•	Mining will directly affect the trout population. **(Minepop)**	.437	.191	
•	**Mining** should be allowed in the Indian Bay watershed.	.414	.225	.034
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.492	.242	.017

•	I would be concerned about too many **tourists** taking our fish in the Indian Bay	.505	.255	.035
B.5	**Dependent Variable (Statement): I would not fish where I could hear logging activity.** Regression equation: Y (hearlog) = 1.180 + 0.309 (hear mine) + 0.325 (minepop)			
•	Tourists would not fish in an area where they could **hear mining** activity.	.421	.177	
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.491	.241	.064
B.6	**Dependent Variable (Statement): I would not fish where I could see a clear cut.** Regression equation: Y (see clear cut) = 2.081 + 0.204 (hear mine) + 0.176 (development) + 0.171 (pond remote) + -0.134 (mining)			
•	Tourists would not fish where they could **hear mining** activity.	.301	.091	
•	Cabin **development** causes damage to the natural environment.	.370	.137	.016
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.404	.163	.026
•	**Mining** should be allowed in the Indian Bay watershed.	.425	.181	.018
C.1	**Dependent Variable (Statement): The trout population in the Indian Bay watershed has decreased.** Regression equation: Y (population) = 3.381 + -0.162 (no restrictions) + 0.153 (pond remote) + 0.156 (biological) + 0.122 (manage)			
•	There should be **no restrictions** on building a cabin in the Indian Bay watershed.	.279	.078	
•	Some ponds in the watershed should be kept at remote areas.**(Pond remote)**	.333	.111	.033
•	More **biological** information is needed in order to manage the trout in Indian Bay more effectively.	.367	.135	.024
•	People who use the watershed should have a say in **managing** the trout resource.	.386	.149	.014
C.2	**Dependent Variable (Statement): It is important to increase the trout population.** Regression equation: Y (increase) = 4.783 + 0.113 (pond remote) + 0.104 (recreational) + 0.089 (no road)			
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.235	.076	
•	The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.	.315	.099	.023
•	There should be areas of the Indian Bay watershed that have **no road** access.	.350	.123	.024
C.3	**Dependent Variable (Statement): Very little is known about the trout population of the Indian Bay watershed.** Regression equation: Y (little known) = 3.427 + 0.165 (tourists)			

•	I would be concerned about too many **tourists** taking our fish in the Indian Bay.	.193	.037	
C.4	**Dependent Variable (Statement): The trout population in the Indian Bay watershed is vulnerable and can easily over fished.** Regression equation: Y (vulnerable) = 3.746 + -.212 (no restrictions) + 0.181 (mining) + 0.106 (biological) + 0.122 (tourists) + 0.127 (recreational)			
•	There should be **no restrictions** on building a cabin in the Indian Bay watershed.	.375	.141	
•	Mining will directly affect the trout population. **(Minepop)**	.496	.256	.115
•	More biological information is needed in order to **manage** the trout in Indian Bay watershed.	.516	.267	.011
•	I would be concerned about too many **tourists** taking our fish in the Indian Bay.	.534	.285	.018
•	The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.	.550	.302	.017
C.5	**Dependent Variable (Statement): I would like to have a variety of different angling opportunities in the Indian Bay watershed.** Regression equation: Y (angling) 1.215 + 0.149 (manage) + 0.213 (attraction) + 0.147 (go anywhere) + 0.130 (hear mine) 0.135 (pond remote)			
•	People who use the Indian Bay watershed should have a say in **managing** the trout	.286	.082	
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.380	.155	.063
•	People should be able to **go anywhere** in the Indian Bay watershed.	.433	.188	.043
•	I would not fish where I could **hear mining** activity.	.476	.227	.039
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.501	.251	.024
C.6	**Dependent Variable (Statement): It is important to learn what people think about trout in the Indian Bay watershed.** Regression equation: Y (think) = 2.376 + 0.300 (biological) + 0.143 (manage) + 0.100 (pond remote) + 0.108 (attractions)			
•	More **biological** information is needed in order to manage the trout in Indian Bay more effectively.	.423	.179	
•	People who use the Indian Bay watershed should have a say in **managing** the trout fishery.	.469	.220	.011
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.485	.245	.015
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.498	.258	.023
C.7	**Dependent Variable (Statement): It is important to learn what people are willing to do in order to have a healthy trout population.** Regression equation: Y (learn) = 2.418 + 0.164 (pond remote) + 0.170 (biological) + 0.089 (minepop) + 0.128 (attraction) + 0.100 (manage) + 0.069 (no cabins)			

•	Some ponds in the watershed should be kept as remote areas. (**Pond remote**)	.389	.158	
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.508	.259	.101
•	Mining will directly affect the trout population. (**Minepop**)	.545	.297	.038
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.568	.322	.025
•	People who use the Indian Bay watershed should have a say in **managing** the trout fishery.	.584	.342	.020
•	**No** more **cabins** should be built in the Indian Bay watershed.	.600	.359	.017

Appendix Three - Table Seven:
Results of Step-wise Linear Regression using statements answered by 'Angler respondents' applied to statements answered by 'All respondents'. Note: All results are statistically significant at $p<0.05$.

Independent Variables:		R value	R sq.	R sq. Diff.
A.1	**Dependent Variable (Statement): All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay.** Regression equation: Y (traditional) = 1.803 + 0.315 (go anywhere) + 0.199 (drive) + 0.168 (manage)			
•	People should be able to **go anywhere** in the Indian Bay watershed.	.416	.173	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed	.456	.208	.035
•	People who use the watershed should have a say in **managing** the trout.	.475	.226	.018
A.2	**Dependent Variable (Statement): There should be a checkpoint on the access road into the Indian Bay watershed where everyone must report.** Regression equation: Y (checkpoint) =3.324 + 0.144 (minepop) + -0.177 (no restrictions) + 0.182 (recreational) + 0.129 (biological) + 0.109 (tourists)			
•	Mining will directly affect the trout population. **(Minepop)**	.284	.081	
•	There should be **no restrictions** on building a cabin in the Indian Bay watershed.	.358	.128	.047
•	The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.	.401	.161	.033
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.426	.181	.020
•	I would be concerned about too many **tourists** taking our fish in the Indian Bay watershed.	.447	.200	.019
A.3	**Dependent Variable (Statement): Different regulations are needed on different ponds in order to provide a range of angling opportunities.** Regression equation: Y (regulations) = -0.577 + 0.308 (pond remote) + 0.204 (minepop) + 0.172 (guiding) + 0.223 (attraction) + 0.130 (tourists)			
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.361	.130	
•	Mining will directly affect the trout population. **(Minepop)**	.458	.210	.080
•	Recreational **guiding** services should be increased in the Indian Bay watershed.	.502	.252	.012
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.522	.273	.021
•	I would be concerned about too many **tourists** taking our fish in the Indian Bay.	.538	.289	.016

A.4	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be closed to ice fishing.** Regression equation: Y(no ice) = 0.987 + 0.269 (development) + -.134 (drive) + 0.271 (attraction) + -.151 (go anywhere) + 0.190 (no road) + 0.145 (outfitting)			
•	Cabin **development** causes damage to the natural environment.	.310	.096	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed	.395	.156	.060
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.444	.197	.041
•	People should be able to **go anywhere** in the Indian Bay watershed.	.471	.222	.025
•	There should be areas of the Indian Bay watershed that have **no road** access.	.495	.245	.023
•	An **outfitting** lodge should be allowed in the Indian Bay watershed.	.515	.265	.020
A.5	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be catch and release.** Regression equation: Y (catch and release) = 2.146 + 0.199 (pond remote) + -.151 (drive) + 0.196 (biological) + 0.125 (development)			
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.278	.077	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed.	.323	.104	.027
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.356	.127	.023
•	Cabin **development** causes damage to the natural environment.	.377	.142	.015
A.6	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be managed for trophy trout only.** Regression equation: Y (managed) = -1.693 + 0.387 (pond remote) + 0.220 (outfitting) + 0.163 (no cabins) + 0.273 (attraction) + 0.147 (development)			
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.371	.130	
•	An **outfitting** lodge should be allowed in the Indian Bay watershed.	.447	.210	.080
•	**No** more **cabins** should be built in the Indian Bay watershed.	.493	.252	.012
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.521	.273	.021
•	Cabin **development** causes damage to the natural environment.	.538	.289	.016
A.7	**Dependent Variable (Statement): Trout fishing on some ponds in the Indian Bay watershed should be fly-fishing only.** Regression equation: Y (fly fishing) = 2.869 + 0.235 (development) + -0.163 (drive) + 0.164 (guiding)			

•	Cabin **development** causes damage to the natural environment.	.287	.083	
•	I should be able to **drive** a vehicle anywhere I want in the Indian Bay watershed.	.351	.123	.040
•	Recreational **guiding** services should be increased in the Indian Bay watershed.	.387	.150	.027
B.1	**Dependent Variable (Statement): The scenery is important to the enjoyment of a fishing experience in Indian Bay.** Regression equation: Y (scenery) = 3.759 + 0.134 (pond remote) + 0.099 (minepop) + 0.109 (manage) + 0.107 (recreational)			
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.257	.066	
•	Mining will directly affect the trout population. **(Minepop)**	.317	.101	.035
•	People who use the Indian Bay watershed should have a say in **managing** the trout fishery.	.360	.129	.028
•	The **recreational** trout fishery of Indian Bay watershed could become an important of the local economy.	.387	.150	.021
B.2	**Dependent Variable (Statement): I would not fish where I could see a cabin.** Regression equation: Y (see cabin) = .745 + 0.230 (development) + 0.180 (no cabins) + 0.154 (minehear)			
•	Cabin **development** causes damage to the natural environment.	.347	.120	
•	**No** more **cabins** should be built in the Indian Bay watershed	.398	.159	.039
•	Tourists would not fish where they could **hear mining** activity.	.425	.180	.021
B.3	**Dependent Variable (Statement): I would not fish where I could see mining activity.** Regression equation: Y (see mine) = 0.683 + 0.361 (minepop) + 0.296 (hear mine) + 0.149 (pond remote)			
•	Mining will directly affect the trout population. **(minepop)**	.475	.226	
•	Tourists would not fish in an area where they could **hear mining** activity.	.548	.300	.074
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.562	.316	.016
B.4	**Dependent Variable (Statement): I would not fish in an area where I could hear mining activity.** Regression equation: Y (hear mine) = 2.246 + 0.306 (minepop) + -.216 (mining) + 0.167 (biological) + 0.122 (tourists)			
•	Mining will directly affect the trout population. **(Minepop)**	.437	.191	
•	**Mining** should be allowed in the Indian Bay watershed.	.414	.225	.034
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.492	.242	.017

•	I would be concerned about too many **tourists** taking our fish in the Indian Bay	.505	.255	.035
B.5	**Dependent Variable (Statement): I would not fish where I could hear logging activity.** Regression equation: Y (hearlog) = 1.180 + 0.309 (hear mine) + 0.325 (minepop)			
•	Tourists would not fish in an area where they could **hear mining** activity.	.421	.177	
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.491	.241	.064
B.6	**Dependent Variable (Statement): I would not fish where I could see a clear cut.** Regression equation: Y (see clear cut) = 2.081 + 0.204 (hear mine) + 0.176 (development) + 0.171 (pond remote) + -0.134 (mining)			
•	Tourists would not fish where they could **hear mining** activity.	.301	.091	
•	Cabin **development** causes damage to the natural environment.	.370	.137	.016
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.404	.163	.026
•	**Mining** should be allowed in the Indian Bay watershed.	.425	.181	.018
C.1	**Dependent Variable (Statement): The trout population in the Indian Bay watershed has decreased.** Regression equation: Y (population) = 3.381 + -0.162 (no restrictions) + 0.153 (pond remote) + 0.156 (biological) + 0.122 (manage)			
•	There should be **no restrictions** on building a cabin in the Indian Bay watershed.	.279	.078	
•	Some ponds in the watershed should be kept at remote areas.**(Pond remote)**	.333	.111	.033
•	More **biological** information is needed in order to manage the trout in Indian Bay more effectively.	.367	.135	.024
•	People who use the watershed should have a say in **managing** the trout resource.	.386	.149	.014
C.2	**Dependent Variable (Statement): It is important to increase the trout population.** Regression equation: Y (increase) = 4.783 + 0.113 (pond remote) + 0.104 (recreational) + 0.089 (no road)			
•	Some ponds in the watershed should be kept as remote areas. **(pond remote)**	.235	.076	
•	The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.	.315	.099	.023
•	There should be areas of the Indian Bay watershed that have **no road** access.	.350	.123	.024
C.3	**Dependent Variable (Statement): Very little is known about the trout population of the Indian Bay watershed.** Regression equation: Y (little known) = 3.427 + 0.165 (tourists)			

•	I would be concerned about too many **tourists** taking our fish in the Indian Bay.	.193	.037	
C.4	**Dependent Variable (Statement): The trout population in the Indian Bay watershed is vulnerable and can easily over fished.** Regression equation: Y (vulnerable) = 3.746 + -.212 (no restrictions) + 0.181 (mining) + 0.106 (biological) + 0.122 (tourists) + 0.127 (recreational)			
•	There should be **no restrictions** on building a cabin in the Indian Bay watershed.	.375	.141	
•	Mining will directly affect the trout population. **(Minepop)**	.496	.256	.115
•	More biological information is needed in order to **manage** the trout in Indian Bay watershed.	.516	.267	.011
•	I would be concerned about too many **tourists** taking our fish in the Indian Bay.	.534	.285	.018
•	The **recreational** trout fishery of Indian Bay watershed could become an important part of the local economy.	.550	.302	.017
C.5	**Dependent Variable (Statement): I would like to have a variety of different angling opportunities in the Indian Bay watershed.** Regression equation: Y (angling) 1.215 + 0.149 (manage) + 0.213 (attraction) + 0.147 (go anywhere) + 0.130 (hear mine) + 0.135 (pond remote)			
•	People who use the Indian Bay watershed should have a say in **managing** the trout	.286	.082	
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.380	.155	.063
•	People should be able to **go anywhere** in the Indian Bay watershed.	.433	.188	.043
•	I would not fish where I could **hear mining** activity.	.476	.227	.039
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.501	.251	.024
C.6	**Dependent Variable (Statement): It is important to learn what people think about trout in the Indian Bay watershed.** Regression equation: Y (think) = 2.376 + 0.300 (biological) + 0.143 (manage) + 0.100 (pond remote) + 0.108 (attraction)			
•	More **biological** information is needed in order to manage the trout in Indian Bay more effectively.	.423	.179	
•	People who use the Indian Bay watershed should have a say in **managing** the trout fishery.	.469	.220	.011
•	Some ponds in the watershed should be kept as remote areas. **(Pond remote)**	.485	.245	.015
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.498	.258	.023

C.7	**Dependent Variable (Statement): It is important to learn what people are willing to do in order to have a healthy trout population.** Regression equation: Y (learn) = 2.418 + 0.164 (pond remote) + 0.170 (biological) + 0.089 (minepop) + 0.128 (attraction) + 0.100 (manage) + 0.069 (no cabins)			
•	Some ponds in the watershed should be kept as remote areas. (**Pond remote**)	.389	.158	
•	More **biological** information is needed in order to manage the trout in Indian Bay watershed.	.508	.259	.101
•	Mining will directly affect the trout population. (**Minepop**)	.545	.297	.038
•	Trout fishing in the Indian Bay watershed is an important tourist **attraction** for the region.	.568	.322	.025
•	People who use the Indian Bay watershed should have a say in **managing** the trout fishery.	.584	.342	.020
•	**No** more **cabins** should be built in the Indian Bay watershed.	.600	.359	.017

Appendix Three - Table Eight:
Results of Step-wise Linear Regression applied to Questionnaire Statements answered by 'Angler respondents'. Note: All results are statistically significant at $p<0.05$.

Independent Variables:		R value	R sq.	R sq. Diff.
A.	**ACCESS TO THE TROUT RESOURCE**			
A.1	**Dependent Variable (Statement): All Newfoundlanders have a traditional right to fish anywhere in the Indian Bay watershed.** Regression equation: Y (traditional) = 4.861 + -0.198 (managed) + 0.302 (angling) + -0.195 (no ice)			
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.272	.074	
•	I would like to have a variety of different **angling** opportunities in the Indian Bay watershed.	.329	.108	.034
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.317	.142	.034
A.2	**Dependent Variable (Statement): There should be a checkpoint on the access road into the Indian Bay watershed.** Regression equation: Y (checkpoint) = 1.218 + 0.369 (vulnerable) + 0.234 (angling) + 0.211 (learn)			
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.482	.232	
•	I would like to have a variety of different **angling** opportunities in the Indian Bay watershed.	.545	.297	.065
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.561	.315	.018
A.3	**Dependent Variable (Statement): Different regulations are needed on different ponds in order to provide a range of angling opportunities.** Regression equation: Y (regulations) = 0.843 + 0.297 (managed) + 0.381 (vulnerable) + 0.152 (catch and release)			
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.485	.235	
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.581	.338	.103
•	Some ponds in the Indian Bay watershed should be **catch** and release only.	.604	.365	.027
A.4	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be closed to ice fishing.** Regression equation: Y (no ice) = 0.978 + 0.283 (managed) + 0.239 (see clearcut) + 0.206 (fly fishing) + -0.146 (traditional) + 0.149 (population)			
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.456	.208	

•	I would not fish where I could **see a clear cut**.	.518	.268	.060
•	Some ponds in the Indian Bay watershed should be **fly fishing** only.	.552	.305	.037
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.	.568	.322	.017
•	The trout **population** in the Indian Bay watershed has decreased.	.578	.334	.012
A.5	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be catch and release only.** Regression equation: Y (catch and release) = -0.567 + 0.323 (fly fishing) + 0.325 (think) + 0.180 (see clearcut) + 0.181 (regulations)			
•	Some ponds in the Indian Bay watershed should be **fly fishing** only.	.419	.175	
•	It is important to learn what people **think** about the trout in the Indian Bay watershed.	.499	.249	.014
•	I would not fish where I could **see a clear cut**.	.529	.280	.031
•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.547	.299	.019
A.6	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be managed specifically for trophy trout.** Regression equation: Y (managed) = 1.486 + 0.374 (regulations) + 0.226 (no ice) + 0.156 (fly fishing) + -0.128 (traditional)			
•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.485	.235	
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.564	.318	.083
•	Some ponds in the Indian Bay watershed should be **fly fishing** only.	.582	.339	.021
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.	.595	.354	.015
A.7	**Dependent Variable (Statement): Some ponds in the Indian Bay watershed should be fly fishing only.** Regression equation: Y (fly fishing) = 1.223 + 0.299 (catch and release) + 0.200 (managed) + 0.183 (no ice)			
•	Some ponds in the Indian Bay watershed should be **catch** and release only.	.417	.174	
•	Some ponds in the Indian Bay watershed should be **managed** specifically for trophy trout.	.505	.255	.081
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.535	.286	.031
B.	**DEVELOPMENT**			
B.1	**Dependent Variable (Statement): The scenery is important to the enjoyment of a fishing experience in Indian Bay watershed.** Regression equation: Y (scenery) = 2.609 + 0.237 (think) + 0.300 (increase) + 0.066 (see mine)			

•	It is important to learn what people **think** about the trout in the Indian Bay watershed.	.392	.154	
•	It is important to **increase** the trout population.	.481	.231	.077
•	I would not fish where I could **see mining** activity.	.494	.244	.013
B.2	**Dependent Variable (Statement): I would not fish where I could see a cabin.** Regression equation: Y (see cabin) = 0.535 + 0.213 (see clearcut) + 0.233 (see mining) + 0.133 (no ice)			
•	I would not fish where I could **see a clear cut**.	.403	.163	
•	I would not fish where I could **see mining** activity.	.448	.201	.077
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.470	.221	.013
B.3	**Dependent Variable (Statement): I would not fish where I could see mining activity.** Regression equation: Y (see mine) = 0.018 + 0.496 (hear mine) + 0.270 (see clearcut) + 0.152 (vulnerable) + 0.107 (little known)			
•	I would not fish where I could **hear mining** activity.	.682	.465	
•	I would not fish where I could **see a clear cut.**	.733	.538	.073
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.743	.552	.014
•	Very **little is known** about the trout population of the Indian Bay watershed.	.748	.560	.008
B.4	**Dependent Variable (Statement): I would not fish in an area where I could hear mining activity.** Regression equation: Y (hear mine) = 0.275 + 0.652 (hearlog) + 0.320 (see mine)			
•	I would not fish where I could **hear logging** activity.	.823	.677	
•	I would not fish where I could **see mining** activity.	.859	.738	.061
B.5	**Dependent Variable (Statement): I would not fish where I could hear logging activity.** Regression equation: Y (hearlog) = -0.444 + 0.718 (hear mine) + 0.163 (see clearcut) + 0.134 (angling)			
•	I would not fish where I could **hear mining** activity.	.882	.676	
•	I would not fish where I could **see a clear cut**.	.836	.699	.023
•	I would like to have a variety of different **angling** opportunities in the Indian Bay watershed.	.841	.707	.008

B.6	**Dependent Variable (Statement): I would not fish where I could see a clear cut.** Regression equation: Y (see clearcut) = -0.062 + 0.314 (see mine) + 0.276 (hearlog) + 0.162 (no ice) + 0.168 (catch and release) + -0.165 (regulations) + 0.127 (see cabin) + 0.124 (population)			
•	I would not fish where I could **see mining** activity.	.560	.314	
•	I would not fish where I could **hear logging** activity.	.609	.371	.057
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.648	.420	.490
•	Some ponds in the Indian Bay watershed should be **catch** and release only.	.666	.443	.023
•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.678	.459	.016
•	I would not fish where I could **see a cabin**.	.687	.472	.013
•	The trout **population** in the Indian Bay watershed has decreased.	.694	.482	.010
C.	**MANAGEMENT**			
C.1	**Dependent Variable (Statement): The trout population in the Indian Bay watershed has decreased.** Regression equation: Y (population) = 0.963 + 0.327 (vulnerable) + 0.303 (increase) + 0.120 (no ice)			
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished	.373	.139	
•	It is important to **increase** the trout population.	.414	.172	.033
•	Some ponds in the Indian Bay watershed should be closed to ice fishing. **(No ice)**	.440	.194	.022
C.2	**Dependent Variable (Statement): It is important to increase the trout population.** Regression equation: Y (increase) = 2.903 + 0.252 (learn) + 0.224 (scenery) + 0.111 (population)			
•	It is important to **learn** what people are willing to do in order to have a healthy trout population	.388	.151	
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay watershed.	.456	.208	.057
•	The trout **population** in the Indian Bay watershed has decreased.	.490	.240	.032
C.3	**Dependent Variable (Statement): Very little is known about the trout population of the Indian Bay watershed.** Regression equation: Y (little known) = 2.373 + 0.200 (vulnerable) + 0.137 (see mine)			
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.216	.047	

•	I would not fish where I could **see mining** activity.	.267	.071	.024
C.4	**Dependent Variable (Statement): The trout population in the Indian Bay watershed is vulnerable and can easily be over fished.** Regression equation: Y (vulnerable) = 0.704 + 0.265 (checkpoint) + 0.167 (regulations) + 0.268 (learn) + 0.137 (population) + 0.08958 (see mine) + -0.0811 (traditional) + 0.094 (little known)			
•	There should be a **checkpoint** on the access road into the Indian Bay watershed.	.483	.234	.112
•	Different **regulations** are needed on different ponds in order to provide a range of angling opportunities.	.588	.346	.046
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.626	.392	.034
•	The trout **population** in the Indian Bay watershed has decreased.	.653	.426	.020
•	I would not fish where I could **see mining** activity.	.668	.446	.016
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.	.680	.462	.016
•	Very **little is known** about the trout population of the Indian Bay watershed.	.688	.473	.011
C.5	**Dependent Variable (Statement): I would like to have a variety of different angling opportunities in the Indian Bay watershed.** Regression equation: Y (angling) = 1.492 + .309 (checkpoint) + 0.115 (hearlog) + 0.173 (think) + 0.100 (traditional)			
•	There should be a **checkpoint** on the access road into the Indian Bay watershed.	.367	.134	
•	I would not fish where I could **hear logging** activity.	.423	.179	.045
•	It is important to learn what people **think** about the trout in the Indian Bay watershed	.450	.203	.024
•	All Newfoundlanders have a **traditional** right to fish anywhere in the Indian Bay watershed.	.474	.224	.021
C.6	**Dependent Variable (Statement): It is important to learn what people think about trout in the Indian Bay waters.** Regression equation: Y (think) = 0.218 + 0.563 (learn) + 0.233 (scenery) + 0.087 (catch and release) + 0.071 (hearlog)			
•	It is important to **learn** what people are willing to do in order to have a healthy trout population.	.577	.333	
•	The **scenery** is important to the enjoyment of a fishing experience in Indian Bay.	.614	.377	.044
•	Some ponds in the Indian Bay watershed should be **catch** and release only.	.629	.396	.019
•	I would not fish where I could **hear logging** activity.	.639	.408	.012

C.7	**Dependent Variable (Statement): It is important to learn what people are willing to do in order to have a healthy trout population.** Regression equation: Y (learn) = 1.654 + 0.344 (think) + 0.147 (vulnerable) + 0.182 (increase) + 0.095 (checkpoint)			
•	It is important to **learn** what people think about trout in the Indian Bay watershed.	.583	.340	
•	The trout population in the Indian Bay watershed is **vulnerable** and can easily be over fished.	.642	.412	.072
•	It is important to **increase** the trout population.	.667	.44	.032
•	There should be a **checkpoint** on the access road into the Indian Bay watershed where everyone must report.	.676	.457	.013