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"Sustainable but just on the edge" : assessing the sustainability of the commercial whale-watching industry in the Lower Bay of Fundy, New Brunswick, Canada

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"SUSTAINABLE BUT JUST ON THE EDGE:" ASSESSING THE SUSTAINABILITY OF THE COMMERCIAL WHALE-WATCHING INDUSTRY IN THE LOWER BAY OF FUNDY, NEW BRUNSWICK, CANADA

by

Eli G. Bamfo
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Master of Applied Science

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Environmental Applied Science and Management

Toronto, Ontario, Canada, 2007

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ABSTRACT

The principal contention of this study is that within the sustainability paradigm, there are factors which can be characterized as agents of strength (factors with a reinforcing effect on sustainability) or vulnerability (factors that inhibit sustainability or are indicators of a non-sustainable system). This paper aimed to ascertain the agents of strength and vulnerability within the commercial whale-watching industry in the lower Bay of Fundy, New Brunswick.

A research framework was developed based on the literature on the whale-watching industry and wildlife-based tourism. The framework was used to assess the management, environmental and economic sustainability dimensions of the whale-watching industry in the aforementioned region based on data gathered from personal interviews with tour operators and self-administered questionnaires from the whale-watching customers.

Several factors were found to be positively reinforcing the industry, including: the consistency of the whale encounters and the high level of customer satisfaction. On the other hand, a number of variables were also identified as potential areas of vulnerability,

such as: the present downturn in tourist visitation to the region and the need for an improved, consolidated marketing program.

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DEDICATION

This work is dedicated to the memory of Mr. Chuck Schom.

Thank you for the insights you provided.

TABLE OF CONTENTS

		Page
Title Page		i
Author's Declaration		ii
Abstract		iii
Personal Acknowledgements		v
Dedication		vi
Table of Contents		vii
List of Tables		x
List of Figures		xiii
CHAPTER ONE	**INTRODUCTION AND OVERVIEW OF THE RESEARCH**	**1**
1.1	Introduction	1
1.2	Research purpose and objective	4
1.3	Significance of the research	6
1.4	Scope of the research	7
1.5	Outline of the paper	8
CHAPTER TWO	**THE SUSTAINABLE WHALE-WATCHING TOURISM RESEARCH FRAMEWORK**	**10**
2.1	Introduction	10
2.2	The development of whale watching	10
2.3	The development and economic impact of the whale-watching industry in Canada	13
2.4	The whale-watching industry in New Brunswick	16
2.5	The research framework	18
2.6	Factors listed in the research framework	21
	2.6.1 Competition between tour vessels	21
	2.6.2 Tour vessel conduct	22
	2.6.3 Management	26
	2.6.4 Trends in the number and species of whale encounters	32
	2.6.5 Marketing and advertising of the whale-watching industry	33

2.6.6 Number and flow of customers 35
2.6.7 Customer satisfaction with the tour 37
2.6.8 Perceptions of the environmental and economic sustainability of the whale-watching industry 38

CHAPTER THREE RESEARCH METHODOLOGY 41

3.1 Study site selection 41

3.2 Study site: The lower Bay of Fundy, New Brunswick 42

3.3 Number of tour operators in study region and participation in the research 43

3.4 Approach to data collection 43

3.5 Semi-structured personal interviews 45

3.6 Customer questionnaires 49

3.7 Analyses: Tour operator interviews and customer questionnaires 59

CHAPTER FOUR PROFILE OF THE RESEARCH PARTICIPANTS 61

4.1 Introduction 61

4.2 Profile of the tour operators and their operations 61

4.3 Profile of the whale-watching customers 67

4.4 Chapter conclusion 80

CHAPTER FIVE APPLYING THE SUSTAINABLE WHALE-WATCHING TOURISM MODEL TO THE COMMERICAL WHALE-WATCHING INDUSTRY IN THE LOWER BAY OF FUNDY 82

5.1 Introduction 82

5.2 Competition between the tour vessels 83

5.3 Tour vessel conduct 97

5.4 Tour operator endorsement of and perspectives regarding the adequacy of current management programs 103

5.5 Trends in the number and species of whale encounters 115

5.6 Perceptions of the environmental sustainability of the whale-watching industry 119

5.7 Marketing and advertising of the tour companies 124

5.8 The number and flow of whale-watching customers 132

5.9 Customer satisfaction with the tours 142

5.10 Perceptions of the economic sustainability of the whale-watching industry 146

5.11 Chapter conclusion 147

CHAPTER SIX IMPLICATIONS OF THE RESEARCH FINDINGS 149

6.1 Introduction 149

6.2 The implications of the research findings for the management of the commercial whale-watching industry 149

6.3 The implications of the research findings for the environmental sustainability of the commercial whale-watching industry 155
6.3.1 Monitoring of cetacean populations 155
6.3.2 Environmental sustainability 157

6.4 Implications of the research findings for the economic sustainability of the commercial whale-watching industry 158

6.5 Implications of the research findings regarding the strength and vulnerability of the commercial whale-watching industry 163

6.6 Limitations of the research and recommendations for future research 164

6.7 Chapter conclusion: The utility of the research framework in assessing the sustainability of commercial whale-watching tourism 166

APPENDICES

Appendix A 168
Appendix B 174
Appendix C 205

REFERENCES 206

LIST OF TABLES

Table Number	Title	Page
2.1	The growth of the global whale-watching industry throughout the 1990s	11
2.2	Main cetacean species for various whale-watching regions in Canada	14
2.3	Growth in the commercial whale-watching industry in Canada and globally	15
2.4	Economic impact of the boat-based commercial whale-watching industry in Canada for 1998	15
2.5	The core indicators of sustainable tourism	20
2.6	Summary of the effects of disturbance on marine mammals based on the duration of the effects	23
2.7	Reactions of various species of whales in the North Atlantic to human activity over time	25
3.1	Description of commercial whale-watching vessels for St. Andrews, Deer Island, Campobello Island and Grand Manan Island, New Brunswick	44
3.2	Number of questionnaires obtained for the sampling period of August 13 to September 8, 2006	55
4.1	How the tour operators became involved in the commercial whale-watching industry	62
4.2	Mean number of seasons in operation at the time of data collection according to location	64
4.3	Descriptions of a "typical" whale-watching tour in St. Andrews and the Fundy Isles	65
4.4	Comparison between whale-watching customers with previous commercial whale-watching experience and all customers	73
4.5	Whale-watching customers' views on government spending on	75

	the environment and level of concern for the welfare of whales in general and in the Bay of Fundy	
4.6	Whale-watching customers' awareness of voluntary management programs	78
5.1	Additional incentives offered by the tour operators	85
5.2	Tour operator views on the effects of local and regional competition on their particular business	92
5.3	Quarterly growth rates in Canada's GDP and tourism expenditure in 2001	95
5.4	Concerns raised by the tour operators in relation to poor whale-watching vessel conduct	99
5.5	Whale-watching customer evaluation of tour vessel conduct	100
5.6	Recommendations of the tour operators for improving whale-watching management	106
5.7	The duration of the tours (hours) according to location	107
5.8	Environmental changes in the Bay of Fundy observed by the tour operators	120
5.9	Trends in sea surface temperature in the "Cross Border Region"	123
5.10	How the tour operators adapt their tours during slow and peak periods in customer flow	132
5.11	Distance (km) from major mainland locations in New Brunswick to Blacks Harbour (the ferry terminal to Grand Manan Island)	134
5.12	Concerns of the tour operators regarding the economic sustainability of the whale-watching industry	147
6.1	Recommendations for long-term study of cetacean populations from whale-watching vessels	156
A1	Specific information on the four focal species of the whale-watching fleet in the lower Bay of Fundy, New Brunswick	168

A2	Whale populations in Canada listed as extirpated, endangered, threatened, and of special concern under Schedules 1-3 of the *Species at Risk Act* as of August, 2007	170
A3	Boat-based whale-watching guidelines from the Department of Fisheries and Oceans Canada	171
A4	Bay of Fundy Whale Watchers Code of Ethics	172
A5	Summary of the key features of the draft revisions to the Marine Mammal Regulations (MMR)	173
A6	Examples of conservation and ecosystem monitoring efforts in the Bay of Fundy, Gulf of Maine and Scotian Shelf	205

LIST OF FIGURES

Figure Number	Title	Page
1.1	A sustainable system	2
1.2	A modified view of a sustainable system, with examples of various factors that have a bearing on the system	3
2.1	Sustainable whale-watching tourism, listing various factors used to assess the strength and vulnerability of the commercial whale-watching industry in the lower Bay of Fundy region	18
2.2	Market-driven whale-watching and its consequences on whale biology and economic activity	22
2.3	Core components of non-consumptive wildlife use	28
2.4	The relationship of user specialization and site evolution for non-consumptive wildlife use tourism	36
2.5a	The Bay of Fundy, highlighting the study site at the mouth of the Bay	40
2.5b	Proposed Liquid Natural Gas (LNG) terminal sites and assumed LNG freighter route	40
3.1	Relative location of St. Andrews, Deer Island, Campobello Island and Grand Manan Island	42
4.1	Age classification of the whale-watching customers	67
4.2	Highest level of education completed by the whale-watching customers	68
4.3	Length of current visit to St. Andrews and/or the Fundy Isles as indicated by the whale-watching customers	69
4.4	Travel origin of the whale-watching customers	71
4.5	Structure of tour group as indicated by the whale-watching customers	72

4.6	Distribution of the whale-watching customers regarding the importance of wildlife to their decision to go whale watching	76
5.1	Timeline of when the tour operators interviewed in this study began their own commercial whale-watching tour business in St. Andrews or the Fundy Isles	84
5.2	The Market Wharf in St. Andrews, showing the offices of four of the whale-watching businesses	87
5.3	Total tourism expenditure in Canada by millions of 1997 dollars 1986 -2002, indicating the effects of the terrorist attacks of September 11, 2001	94
5.4	Distribution of the whale-watching customers regarding how well the tour was managed by the operator in terms of the welfare of the wildlife	98
5.5	The locations of sightings of finback and minke whales with respect to satellite images of tidal wakes established during flood tides at (A) the northern tip of Campobello Island and (B) the northern tip of Grand Manan Island.	117
5.6	The importance of advertisements on television to the customers' decision to go whale watching on a 5-point scale	130
5.7	The importance of advertisements in tourism booklets/brochures to the customers' decision to go whale watching on a 5-point scale	130
5.8	The importance of scenery to the customers' decision to go whale watching on a 5-point scale	131
5.9	Total number of visitors to Charlotte County attractions between May and October (2000-2006)	135
5.10	Total number of non-resident visitors to New Brunswick (2002-2006)	136
5.11	Atlantic Canada occupancy rates (1997-2005)	136
5.12	Percentage change in domestic tourism spending in Canada by quarter (2004-2007)	138
5.13	Percentage change in non-resident tourism spending in Canada by quarter (2004-2007)	138

5.14	Annual and July/August occupancy rate percentages for New Brunswick (1990-2002)	140
5.15	Customer satisfactions with overall tour experience	142
5.16	Distribution of the whale-watching customers regarding how well the overall interaction with whales matched expectations on a 5-point scale	143
5.17	Distribution of the whale-watching customers regarding how well the overall interaction with the marine wildlife other than whales matched expectations	144

CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE RESEARCH

1.1 Introduction

The concept of sustainability has become a paramount global paradigm, particularly after the 1987 publication of *Our Common Future* by the United Nations (UN) appointed World Commission on Environment and Development (WCED), which popularized the term, sustainable development (SD) (Wright and Nebel, 2002; Jahnke and Nutzinger, 2003; Freedman, 2004, chap.12). The notion of sustainability itself stems from the late medieval forestry of Central Europe and was first manifested through the practice of sustainable yield (Wright and Nebel, 2002; Jahnke and Nutzinger, 2003). Sustainable yield essentially dictates that the harvest or utilization of a particular natural resource should not exceed the capacity of that resource to grow and replenish itself (Wright and Nebel, 2002). Provided that the number or amount harvested always remains within the "built-in capacity" of the resource, the harvest can, in theory, continue forever (Wright and Nebel, 2002, p. 6).

As noted by several authors, since the WCED publication, the implications of the SD paradigm for modern societies have been widely discussed and debated in the literature (Wright and Nebel, 2002; Jahnke and Nutzinger, 2003; Newman, 2005; Johnston et al., 2007). The emerging commonality throughout the discourse is that there are three fundamental or traditional dimensions to the paradigm (Wright and Nebel, 2002). Specifically, sustainability encompasses economic, social and ecological goals; when these dimensions coincide, a system is said to be sustainable (Wright and Nebel, 2002). An illustration of this is shown in Figure 1.1.

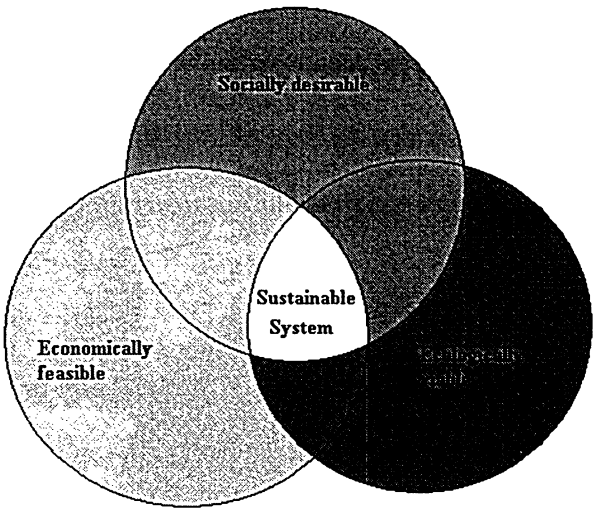

Figure 1.1 A sustainable system *(modified from Wright and Nebel, 2002, p. 7)*

The transition towards sustainability, however, is not as simple as the above depiction implies. First, the characterization of a system as a sustainable one is complicated by the "impossibility of knowing, beyond any doubt, that [that] particular course of action is indeed sustainable" over time (Weaver, 2005, p. 442). Second, each dimension involved in the model is itself a complex system (Farrell and Twining-Ward, 2005). Each contributes its own set of factors or pressures that must be addressed in order to ensure the sustainability of the system as a whole. For example, the economic feasibility of a system is traditionally shaped by factors such as growth, efficiency and the utilization of resources (Wright and Nebel, 2002). Addressing the social issues centers the focus on human dimensions, such as equity, social empowerment and inclusion/exclusion, social cohesion and cultural identity (Wright and Nebel, 2002). Ecological viability issues, on the other hand, are primarily focused on the conservation of natural systems, the carrying capacity of the environment and pollution control (Wright and Nebel, 2002).

Each of these variables has a particular bearing (either positive or negative) on the overall sustainability of the system (Figure 1.2).

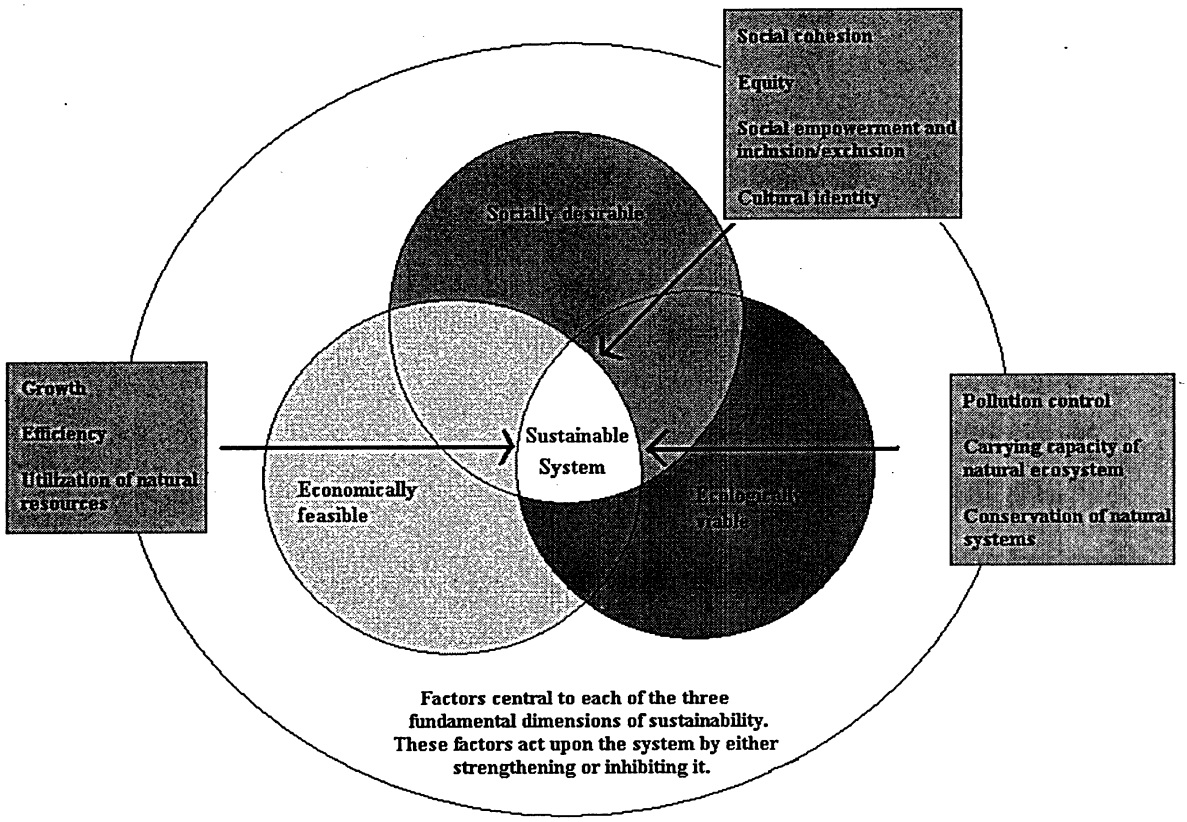

Figure 1.2 A modified view of a sustainable system, with examples of various factors that have a bearing on the system *(modified from Wright and Nebel, 2002, p. 6-7)*

For example, the utilization of natural resources can enhance the sustainability of a society if such resources are used in a manner that does not result in a net depletion of resources or damage to the environment or to human-health (Freedman, 2004, chap.12). On the other hand, the exploitation of natural resources can also contribute to a non-sustainable system if non-renewable resources (e.g. petroleum) form the foundation of the society's economy and if potentially renewable resources (e.g. fish stocks and forests) are depleted beyond the natural capacity of the resource to replace itself (Wright and

Nebel, 2002; Freedman, 2004, chap.12). Consequently, the factors central to each dimension in the model can be defined as agents of strength or vulnerability, effectively reinforcing or inhibiting the viability of the system over time. Identifying and subsequently addressing these factors will help ensure a more successful transition towards sustainability.

1.2 Research purpose and objective

Tourism is amongst the plethora of global industries that have adopted the notion of sustainability. The *Journal of Sustainable Tourism* is an example of the recognition and acceptance of the sustainability paradigm within the tourism sector. Indeed, there is a considerable body of literature that addresses sustainable tourism development, particularly the development of indicators of sustainable tourism (e.g. Dymond, 1997; Miller, 2001; Rebollo and Baidal, 2003; Choi and Sirakaya, 2006; Hunter and Shaw, 2007).

The concept of sustainable tourism itself draws upon the fundamental principles of the sustainability model. This is evident in the World Tourism Organization's (WTO) definition of sustainable tourism, which also refers to the environmental, economic and socio-cultural components of development (WTO, 2004a). Specifically, the WTO definition posits that sustainable tourism should: 1. make optimal use of environmental resources in a manner that maintains the essential ecologically processes and helps to conserve natural heritage and biodiversity; 2. respect the socio-cultural authenticity of host communities, including the conservation of their built and living cultural heritage and traditional values and make a contribution to inter-cultural understanding and tolerance; 3. ensure viable, long-term economic operations and provide fairly distributed

socio-economic benefits to all stakeholders (WTO, 2004a). This description of sustainable tourism is applicable to both mass tourism and niche tourism sectors (WTO, 2004a).

The commercial whale-watching industry is one sector of tourism where the concept of sustainability has been applied, particularly because of the non-consumptive nature of wildlife viewing, wherein the interaction with the wildlife does not "purposefully remove or permanently affect" the focal species (Duffus and Dearden, 1990, p. 215). This means that one person's engagement with the wildlife does not diminish the experience available for another individual (Duffus and Dearden, 1990). Thereby, the activity of viewing wildlife in their natural environments can, in theory, be sustained over time. However, there are many potential areas of strength and vulnerability in the whale-watching industry, particularly because the industry experiences pressures from the tourism system and natural environment; two systems that are decidedly complex (Farrell and Twining-Ward, 2005) and bear a multitude of factors that can strengthen or inhibit sustainability.

The objective of the present study is to determine the strength and vulnerability of the whale-watching industry in the lower Bay of Fundy, New Brunswick region (i.e. St. Andrews, Deer Island, Campobello Island and Grand Manan Island--the latter three locations are collectively referred to as the Fundy Isles). Specifically, this paper seeks to:

> **evaluate management, environmental and economic sustainability dimensions in the commercial whale-watching industry in the aforementioned region in order to ascertain the agents of strength and**

vulnerability that may be enhancing or inhibiting the sustainability of the industry as a whole.

To accomplish this, the perspectives of two key stakeholders involved in the industry (i.e. the tour operators and the whale-watching customers) are used. Personal interviews and questionnaires form the basis of the data for this paper.

1.3 Significance of the research

Globally, whale watching has become an economically important tourism sector, particularly in coastal communities (Warburton et al., 2001), like the study region. Hoyt (2001) estimates that whale watching as a commercial activity is now at least a $1 billion (USD) industry globally, with more than 9 million annual participants. In Canada, the importance of whale-watching tourism in coastal regions is discussed by Lien (2001), who notes that in Churchill, Manitoba, for example, the two main whale-watching businesses in the region draw an estimated 2,500 to 2,700 participants each summer. These participants also bring business to local restaurants and hotels. Lien (2001, p. 3) concludes that: "It is important to protect and encourage an industry like whale watching that makes such an important contribution to coastal economies." Results from this study may provide insights on ways to ensure the sustainability of the industry.

Moreover, the Department of Fisheries and Oceans (DFO), which is the responsible federal government authority for marine mammals in Canada, has recently identified that there is a need to manage the commercial whale-watching industry in Canada through regulatory measures. Consequently, the DFO has began the process of amending the current *Marine Mammal Regulations (MMR)* (under the *Fisheries Act*) to include provisions for marine wildlife viewing (DFO, 2005). Results from this study can

add to this effort by revealing ways in which management can effectively be implemented.

Thirdly, the whale-watching industry in the Bay of Fundy is relatively understudied compared to other parts of Canada (e.g. the coast of British Columbia (B.C.)). This research may present novel results in a part of the country that has not received as much scholarly attention. Furthermore, the lower Bay of Fundy is part of the summer feeding waters for the North Atlantic right whale *(Eubalaena glacialis)* (Baumgartner and Mate, 2005). This species is the most endangered large whale species in Canada, with recent population estimates indicating that there are approximately 300 individuals remaining in the wild (Lien, 2001; Baumgartner and Mate, 2005). The right whale is a focal species for some of the whale-watching vessels in the study region. As such, this study presents a unique opportunity to feature tour businesses that target these highly endangered whales.

1.4 Scope of the research

Whale watching is defined as: "watching cetaceans [whales, dolphins, and porpoises] in the wild, includes watching from a platform (e.g. a ship, cliff, or an aircraft), or swimming with cetaceans" (Spalding and Blumenfeld, 1997, p.5). Based on this definition, whale watching is a rather generic term applied whenever people are actively engaged in observing or interacting with cetaceans in their natural environments. Commercial whale-watching endeavours are the focal point of this present paper. This form of whale watching is defined as "watching whales from a commercial, rather than private/recreational platform" (Spalding and Blumenfeld, 1997, p. 5). Although it is acknowledged that during whale-watching tours, operators may view and target a wide

range of marine organisms (including marine birds, fish, and seals), this paper focuses on boat-based commercial whale-watching businesses in the lower Bay of Fundy, New Brunswick region that specifically advertise the opportunity to view whales in their natural environments. Consequently, whales are the focal marine wildlife of this study.

1.5 Outline of the paper

Following this introductory chapter are chapters two through six, which are arranged as follows. Chapter two details the historical development of the whale-watching industry globally and in Canada, with a focus on New Brunswick. This is subsequently followed by the presentation of the research framework, which is a modified version of the sustainability model illustrated by Wright and Nebel (2002) (Figure 1.1). The framework structures the presentation of the research findings in Chapter five and is based on insights drawn from previous related studies on the whale-watching industry and other wildlife-based tourism.

Chapter three describes the research methodology, including a discussion of the study area, the research approach, interview and questionnaire design and administration, data preparation, data entry and statistical analyses conducted. A profile of the research participants (i.e. the tour operators and whale-watching customers) is then presented in Chapter four.

In Chapter five, findings pertaining to each of the variables identified in the research framework as central aspects to the sustainability of the whale-watching industry are presented and discussed through comparisons to the available literature. In Chapter six, the implications of the findings are discussed within the specific context of whale-watching management, and the environmental and economic sustainability of the industry

in the lower Bay of Fundy region. The insights drawn from the data regarding these three dimensions of the industry are used to ascertain the agents of strength and vulnerability that may be reinforcing or inhibiting the sustainability of whale-watching activities in the region. The strengths and limitations of the study are also discussed, and recommendations for areas in need of future research are made.

CHAPTER TWO

THE SUSTAINABLE WHALE-WATCHING TOURISM RESEARCH FRAMEWORK

2.1 Introduction

As noted in Chapter one, there are three primary components of the commercial whale-watching industry in the lower Bay of Fundy, New Brunswick region which are investigated in this study, namely: the management, environmental, and economic dimensions of the industry. This chapter presents the guiding framework of the research. The framework is drawn from previous related studies in cetacean-based tourism and management. Based on the literature, various factors central to the sustainability of the industry are identified and incorporated into the research model. Collectively, these factors are used to assess the management of whale-watching activities in the study region and the environmental and economic sustainability of the industry in Chapters five and six. This chapter begins with a discussion on the development of the whale-watching industry, after which the research framework is introduced.

2.2 The development of whale watching

Whale watching as a commercial enterprise began in 1955 off the southern coast of California (Warburton et al., 2001). Since then, whale watching has become a significant international industry, especially since the mid 1980s, when it experienced rapid growth (Warburton et al., 2001). The development of whale-watching industries around the world has been particularly documented by Erich Hoyt, a leading researcher on the industry. According to Hoyt (2001), by 1998, nearly 500 communities in 87

countries and territories around the world had some level of commercial whale-watching activities. In fact throughout the 1990s, the global whale-watching industry expanded in every category (e.g. number of countries and communities involved in whale watching; number of participants; annual direct and total expenditure), with an annual growth rate of 12.1 per cent in number of participants (Hoyt, 2001) (Table 2.1).

Table 2.1 The growth of the global whale-watching industry throughout the 1990s (modified from Hoyt, 2001, p. 12).

Year	Number of participants (million)	Direct expenditures (million USD)	Total expenditures (million USD)
1991	4.0	$77.0	$317.9
1994	5.4	$122.4	$504.3
1998	9.0	$299.5	$1,049.1

The expansion of the whale-watching industry in the modern era has been attributed to a shift in society's conceptualization of whales over the past 150 years (Lawrence and Phillips, 2004). According to Duffus and Dearden (1990), the historical context of human perceptions of and contact with wild species is a core component in creating the setting for non-consumptive, recreational use of wildlife. For whales in particular, cultural representations of these animals have gone from the "horrifying monsters" portrayed in Melville's 1851 novel, *Moby Dick,* to the "almost mythical creatures deserving of our respect and admiration," in the 1993 Hollywood film, *Free Willy* and its subsequent sequels (Lawrence and Phillips, 2004, p. 695). Lawrence and Phillips (2004) posit that that this transition has been governed by shifts in three key areas of the human-whale dynamic: the regulatory discourse around whales, from the view of whales as a harvestable natural resource to concerns about the preservation of whale stocks; the anti-whaling campaign, which has recently shifted from an ecological

foundation to the conceptualization of whales as valuable animals with rights on an ethical basis; and popular culture representations of whales, particularly in movies. The shifts in these three "discourses" have helped to create the conditions necessary for the growth of whale watching as a recreational activity and a commercial business (Lawrence and Phillips, 2004).

The evolution in the societal representation of whales is reflective of the emergence of another global phenomenon: ecotourism, a term that was first used in the academic literature by Romeril (1985) (Weaver, 2005). The year 2002 provided the greatest symbols of the growth and formalization of ecotourism. In 2002, the first issue of the peer-reviewed *Journal of Ecotourism* was published (Weaver, 2005), and the UN declared that year as the International Year of Ecotourism (World Ecotourism Summit, 2002). The highlight of this declaration was a four-day conference boasting participants from 132 countries hosted in Quebec City, Quebec in May 2002 (World Ecotourism Summit, 2002).

The characterization of the whale-watching industry as a sustainable form of tourism is rooted in its potential to achieve the principles of ecotourism, which are themselves well-aligned with the three fundamental dimensions of the sustainability paradigm (Figure 1.1). Although several authors have noted that ecotourism is a problematic term to define because there is no universally accepted definition (e.g. Bjoerk, 2000; Herath, 2002), there are common themes within the general concept of the term which indicate that, like the sustainability model and the definition of sustainable tourism referred to earlier, ecotourism also seeks to integrate social, ecological and

economic goals. This is best exemplified in the definition of ecotourism offered by the Canadian Tourism Commission (CTC), which refers to ecotourism as:

> travel that creates a high level of understanding and interpretation of cultural and natural history, while safeguarding the integrity of ecosystems. It produces economic benefits to local communities that encourage resource preservation and sustainable tourism development practices (CTC, 2001, p. 5).

Whether or not the whale-watching industry can be categorized as a true form of ecotourism is a topic beyond the scope of this present paper. The term is briefly mentioned here to highlight its link to the sustainability paradigm, and to note that the expansion of the whale-watching industry around the world is a reflection of the growth in tourist interest and participation in nature-based activities.

2.3 The development and economic impact of the whale-watching industry in Canada

Canada boasts a wide diversity of whale species, from larger whales such as blue whales, humpbacks, finbacks, to smaller cetaceans such as belugas, and long-finned pilot whales (Lien, 2001). This abundance in marine resources along the country's vast coastline has facilitated the establishment of commercial whale-watching businesses on both the Atlantic and Pacific coasts, as well as in the far North (Spalding and Blumenfeld, 1997). Table 2.2 shows the important cetacean species for whale-watching operations in various regions of Canada.

Table 2.2 Main cetacean species for various whale-watching regions in Canada
(modified from Hoyt, 2001, p. 25)

Region	Main species
British Columbia	orcas (*Orcinus orca)*, Dall's porpoises (*Phocoenoides dalli)*, Pacific white-sided dolphins *(Lagenorhynchus obliquidens)*, minke whales *(Balaenoptera acutorostrata)*, grey whales *(Eschrichtius robustus)*
Manitoba	belugas (*Delphinapterus leucas)*
Nunavut	belugas, narwhals *(Monodon monoceros)*
Newfoundland	humpback whales *(Megaptera novaeangliae)*, minke whales, fin whales *(Balaenoptera physalus)*, long-finned pilot whales *(Globicephala melas)*, Atlantic white-sided dolphins *(Lagenorhynchus acutus)*, white-beaked dolphins *(Lagenorhynchus albirostris)*, harbour porpoises *(Phocoena phocoena)*
Nova Scotia and New Brunswick	humpback whales, North Atlantic right whales *(Eubalaena glacialis)*, long-finned pilot whales, fin whales, minke whales, Atlantic white-sided dolphins, white-beaked dolphins, harbour porpoises
Quebec	blue whales *(Balaenoptera musculus)*, fin whales, humpback whales, belugas, minke whales, Atlantic white-sided dolphins, white-beaked dolphins, harbour porpoises

Commercial whale-watching activity in Canada began in 1971 in the St. Lawrence River, Quebec (Hoyt, 2001). The industry experienced considerable growth during the 1990s (Hoyt, 2001). Much of its growth in the early part of the decade occurred in the St. Lawrence River region. Through the mid to late 1990s, the industry continued to grow, establishing in southern Vancouver Island, the Maritimes and

Newfoundland (Hoyt, 2001). The rate of growth throughout the 1990s in both the number of participants and in the monetary value of the industry was much greater in Canada than globally (Table 2.3). By the end of the decade, over 200 operators were involved in boat-based commercial whale-watching activities in the country, generating an estimated $ 27 million in direct expenditure (Table 2.4).

Table 2.3 Growth in the commercial whale-watching industry in Canada and globally (modified from Hoyt, 2001, p. 12 and 25)

	Change in total expenditure (%)		Change in number of participants (%)	
Time Period	**Canada**	**World**	**Canada**	**World**
1991-1994	+120	+58.7	+149	+34.1
1994-1998	+204	+108	+133	+66.3

Table 2.4 Economic impact of the boat-based commercial whale-watching industry in Canada for 1998 (modified from Hoyt, 2001, p. 25)

Region	**Number of operators**	**Number of participants**	**Direct expenditure (million USD)**	**Total expenditure (million USD)**
Newfoundland	48	122,604	$3.159	$19.922
Maritimes: (NB and NS)	57	140,000	3.658	26.422
Quebec	75	440,000	10.151	76.585
Manitoba/Arctic	10	6,200	1.268	3.072
British Columbia	47	215,000	9.102	68.429
Total	**237**	**923,804**	**27.338**	**194, 430**

2.4 The whale-watching industry in New Brunswick

Table 2.4 indicates that the Maritimes region (New Brunswick and Nova Scotia) is the third largest whale-watching region in the country in terms of number of participants, and direct and total expenditure (well after Quebec and B.C.).
The tour businesses in St. Andrews and the Fundy Isles (i.e. the study region) represent the most developed whale-watching area in the Province of New Brunswick, accounting for nine of the ten tour companies advertised in the 2006 official provincial travel guide (New Brunswick Department of Tourism and Parks, 2006a). The one whale-watching tour business advertised in the 2006 travel guide that is not included in the study is located in Blacks Harbour, also along the mouth of the Bay of Fundy (Figure 3.1b). The whale-watching business in this particular location was not included in the study due to travel and time constraints.

The economic impact of whale-watching tourism in New Brunswick alone is difficult to estimate given the lack of specific data on the whale-watching industry in the province. However, it can be said the tourism sector itself is one of the most important industries to the economy of New Brunswick. In 2006, the province received approximately 1.6 million non-resident visitors with tourism revenue forecasted at $1.2 billion (New Brunswick Department of Tourism and Parks, 2007a). The industry also supports over 33,000 jobs in the province.

According to a recent publication by New Brunswick's Department of Tourism and Parks, over three-quarters of visitors to the province express an interest in wildlife, and coastal activities, such as whale watching, are also the primary experiences sought by tourists on vacation (New Brunswick Department of Tourism and Parks, 2004a). This is

exemplified by two recent tourism market studies. The first was conducted in 2005 by the University of New Brunswick, the Atlantic Canada Opportunities Agency (ACOA) and the Province of New Brunswick. This study reported that past visitors most often selected nature, scenery and water activities as their most enjoyed experiences during their visit to New Brunswick (New Brunswick Department of Tourism and Parks, 2006b). In the second study, Lang Research Inc (2007), on behalf of various provincial tourism departments and the CTC, profiled travelers from the United States (U.S.) who had participated in various types of outdoor activities during a trip in recent years. The researchers found that ocean activities and wildlife viewing had the highest levels of participation of all the activity categories reported.

Although the two studies described above do not disclose the specific direct and indirect economic impact of the whale-watching industry in New Brunswick, their results serve as an indication that wildlife and natural areas are significant contributors to the tourist appeal of New Brunswick (New Brunswick Department of Tourism and Parks, 2004a). The Bay of Fundy is one such natural area that is a key tourist attraction. One of the most unique natural features of the Bay of Fundy is its large semidiurnal tides (Ingram et al., 2007). Indeed, the Bay of Fundy is known for having the highest tides in the world, with a mean tidal amplitude range of 5m at the mouth of the Bay (where the tour businesses in this study are located; Figure 2.5a) to over 12m in the upper portion of the Bay (Dashtgard et al., 2007). The importance of the Bay of Fundy to New Brunswick's tourism industry is clearly evident on the opening page of the province's official tourism website, which reads: "Yes we can move 100-billion tons of seawater for you twice daily so you can walk on the ocean floor in New Brunswick's Bay of Fundy.

At high tide, kayak above the very spot where you left your footprints" (New Brunswick Department of Tourism and Parks, 2007b).

2.5 The research framework

Figure 2.1 has been developed as the guiding framework of this study. The framework draws upon the sustainability model illustrated in Wright and Nebel (2002) (Figure 1.1). Similar to that model, the research framework adopts the view that sustainable whale-watching tourism lies at the intersection of economic, social and ecological values.

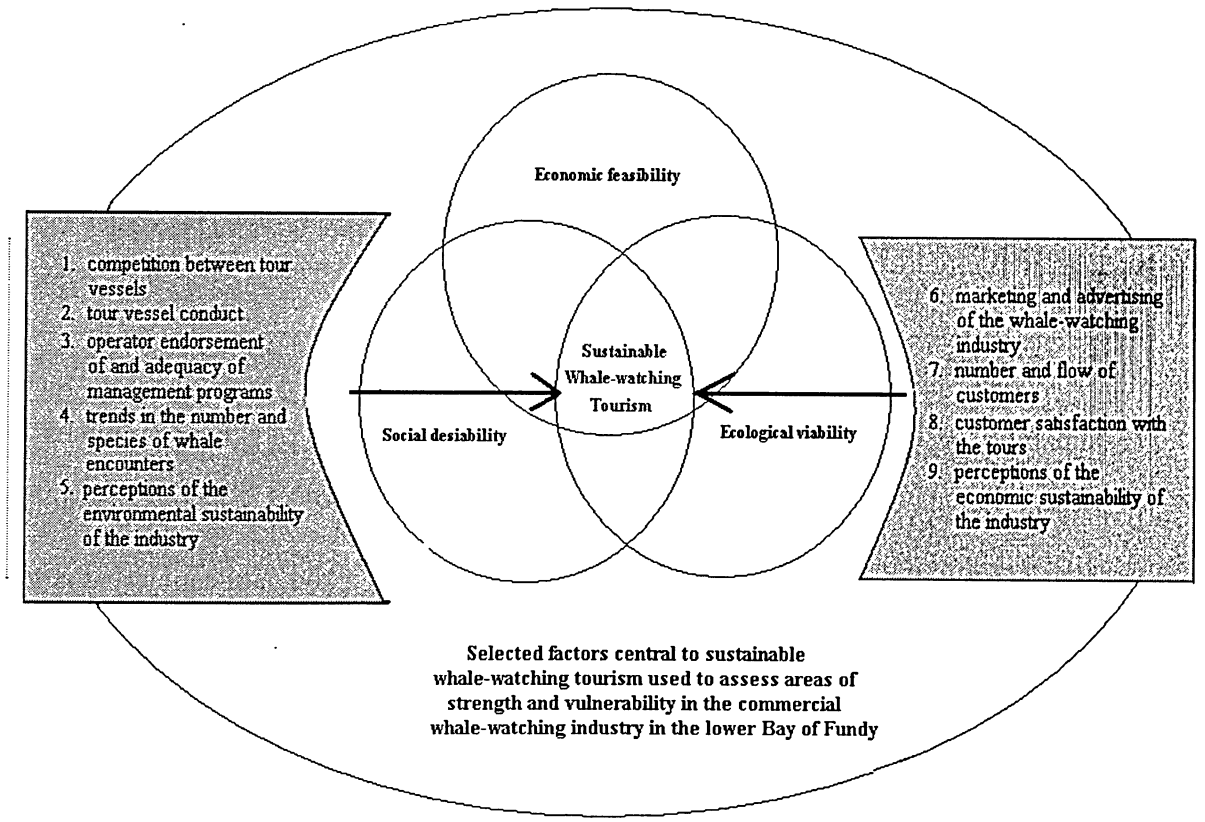

Figure 2.1 Sustainable whale-watching tourism, listing various factors used to assess the strength and vulnerability of the commercial whale-watching industry in the lower Bay of Fundy region

Using this as a starting point, the framework builds on the Wright and Nebel (2002) model by incorporating various factors that have been identified as central aspects to a sustainable whale-watching industry. Each of the variables listed in the model can be represented as an area of strength (i.e. reinforces the system) or an area of vulnerability (i.e. inhibits the system).

It must be noted at this juncture that the research framework is not presented as a completely comprehensive list of all issues central to whale-watching tourism. The factors that are included in the model were derived from the literature on wildlife-based tourism and the whale-watching industry in particular and represent the most common issues that emerged from the literature review. However, other approaches to evaluating the sustainability of whale-watching tourism are available. For example, the WTO has a set of indicators of sustainable tourism which can be used to assess, plan and manage sustainable tourism development (Dymond, 1997; WTO, 2004b). The latest version of the WTO's sustainable tourism indicators, published in 2004, covers a wide range of sustainability issues, including but not limited to, the management of natural resources (e.g. water, energy), satisfaction of tourists and host communities, preservation of cultural heritage, seasonality, and climate change (WTO, 2004b). The 2004 publication was not accessible to the researcher but a summary of the 1995 version is shown in Table 2.5 below.

Table 2.5 The core indicators of sustainable tourism
(from Dymond, 1997, p.281, adapted from the WTO, 1995)

Core indicator	*Specific measures*	*Generic indicator groupings*
1. Site protection	Category of site protection according to the International Union for the Conservation of Nature and Natural Resources (IUCN) index	Ecological
2. Stress	Tourist numbers visiting site (per annum/peak month)	Ecological
3. Use intensity	Intensity of use in peak period (persons/hectare)	Ecological
4. Social impact	Ratio of tourists to locals (peak period and over time)	Social
5. Development control	Existence of environmental review procedure or formal controls over development of site and use densities	Planning
6. Waste management	Percentage of sewage from site receiving treatment (additional indicators may include structural limits of other infrastructural capacity on site, such as water supply)	Ecological
7. Planning process	Existence of organised regional plan for tourist destination region (including tourism component)	Planning
8. Critical ecosystems	Number of rare/endangered species	Ecological
9. Consumer satisfaction	Level of satisfaction by visitors (questionnaire-based)	Economic
10. Local satisfaction	Level of satisfaction by locals (questionnaire-based)	Social
11. Tourism contribution to local economy	Proportion of total economic activity generated by tourism only	Economic

2.5.1 Research approach

This study adopts a qualitative approach to assess the sustainability of the whale-watching industry in the lower Bay of Fundy. The utility of this approach has been demonstrated in the literature. Notably, Woods-Ballard et al. (2003) based their assessment of the sustainability of whale-watching activities in Scotland on phone interviews and mail-in questionnaires from tour operators from well-advertised whale-watching businesses across the island. Numerous other researchers have also used the perspectives of tour operators and/or customers to investigate a range of issues related to the marine wildlife-viewing industry (e.g. Neil et al., 1995; Lawrence et al., 1999; Orams,

2000; Malcolm et al., 2002; Warburton et al., 2001; Valentine et al., 2004; Lück, 2003; Parsons and Woods-Ballard, 2003; Heckel et al., 2003). The factors listed in the above framework are derived from these and other pertinent studies. The remaining sections of this chapter will discuss each factor and the literature on which it is based.

2.6 Factors listed in the research framework

2.6.1 Competition between tour vessels

Competition between marine tour businesses is primarily manifested in two ways: on-ground competition for customers; and competition between vessels during viewing. On-ground competition for customers may lead to inappropriate vessel conduct during tours as operators attempt to provide their passengers with "ideal" viewing experiences (e.g. close approaches to the wildlife, pursuing wildlife) (Lien, 2001). Frequent repetition of competitive behaviour during tours can place conservation efforts at risk (Lien, 2001). This is shown by Heckel et al. (2003), who documented the history and development of the whale-watching industry in Ensenada, Mexico (on the northern Pacific coast of the country) using causal loop diagrams. According to Heckel et al. (2003), the growth of the industry in Ensenda in the early 1990s can be described by a negative feedback loop, whereby on-ground competition between operators for customers led to competition during viewing, as operators would adopt inappropriate tactics to give their customers ideal sighting opportunities of the focal whale species, the Eastern Pacific grey whale (*Eschrichtius robustus*), who migrate to the area during the winter. The authors noted that the conflicts between the operators may cause the migratory corridor of the whales to be displaced farther offshore, which would reduce the number of sightings, then

consequently reduce tourist satisfaction and return rates, and ultimately, lead to financial losses for the tour businesses (Figure 2.2).

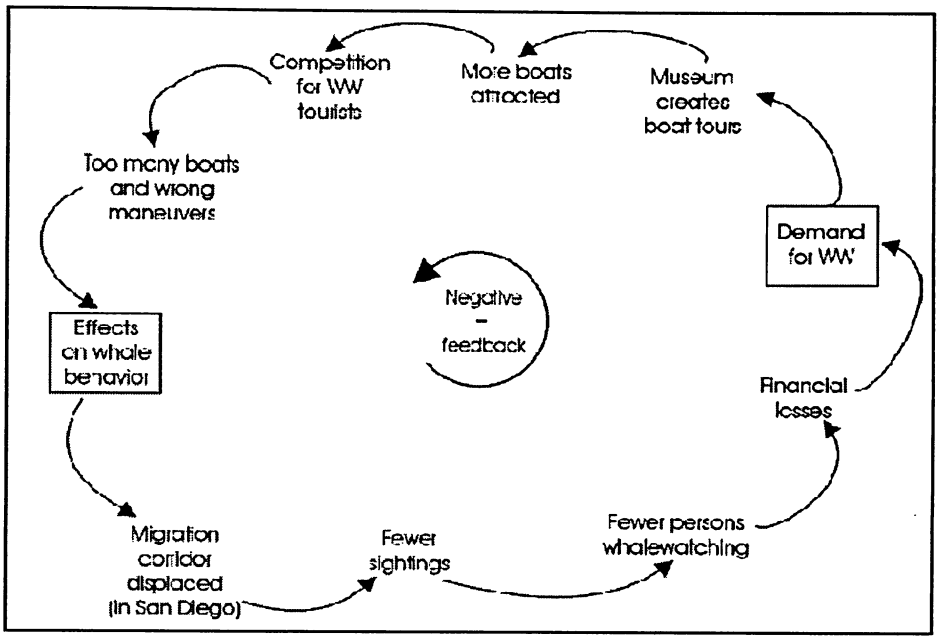

Figure 2.2 Market-driven whale-watching and its consequences on whale biology and economic activity. The causal loop diagram with a counter-clockwise direction indicates factors with a negative feedback on whale behaviour, starting with the demand for whale watching *(modified from Heckel et al., 2003, p. 285).*

Figure 2.2 is clearly not reflective of a sustainable whale-watching system. More importantly, the findings reported by Heckel et al. (2003) highlight the link between competition and sustainable whale-watching practices. Consequently, competition between tour businesses is identified as a central factor to sustainability and is included in the research framework.

2.6.2 Tour vessel conduct

The consequences of tour vessel conduct, such as competitive viewing manoeuvres, are ultimately manifested on the focal organisms. Short-term behavioural responses are the most commonly cited responses of cetaceans to whale-watching vessels

and other boat traffic, although long-term impacts (e.g. changes in population distribution) may potentially occur. Table 2.6 categorizes and summarizes the potential effects of cetacean responses to vessels based on the duration and types of effects.

Table 2.6 Summary of the effects of disturbance on marine mammals based on the duration of the effects
(Woods-Ballard, 2000, p. 13, modified from Duffus and Dearden,1993)

		Effect
Immediate	Direct	Change in an individual's behavioural status or health, for example as a result of a collision
	Indirect	Death of an individual, for example due to a collision, which may have immediate and possibly long term consequences for the success of the breeding group
Short-term	Direct	Interference with important behaviours such as those related to breeding, courtship and care of young
	Indirect	May temporarily shift use of range, which may develop into permanent range reduction or shift
Long-term	Direct	Alteration of range size or distribution
	Indirect	Potential reduction in reproductive capability and fitness, leading to a decline in population

Cetacean responses to wildlife-viewing activity that have been documented in recent studies include: increases in swim speeds (Williams et al., 2002); adopting less predictable and less direct swim paths (Williams et al., 2002; Bejder et al., 2006a); changes in respiratory rhythm (Whitt and Read, 2006; Richter et al., 2006); changes in surface behaviour activity (e.g. resting, group cohesion; fluke slaps) (Lusseau, 2004; Whitt and Read, 2006; Bedjer et al., 2006a); and habitat displacement of less sensitive individuals from the cetacean population (Bejder et al., 2006b). Findings from these studies indicate that the manner of vessel approach, the distance of approach, the duration of vessel-cetacean interaction, and the intensity of tourism activities are particularly important variables in eliciting behavioural responses from the animals. Conversely, other studies have reported that wildlife viewing appeared to have little impacts on the focal organisms (e.g. Neumann and Orams, 2005).

2.6.2.1 Responses of the whale species in the lower Bay of Fundy to whale-watching activity

There are four focal whale species of the commercial whale-watching fleet in the lower Bay of Fundy. These are: the humpback whale (*Megaptera novaeangliae)*, finback whale (*Balaenoptera physalus),* minke whale (*Balaenoptera acutorostrata*), and as noted earlier, the North Atlantic right whale (*Eubalaena glacialis*) (Ingram et al., 2007). Specific information on the population size and vulnerability of each of these species in the North Atlantic can be found in Appendix A (Table A1 and Table A2).

Relatively few recent studies are available on the effects of whale-watching activities on the above four species. Of the studies that were found, most of them have focused on humpback whales. Recent studies on the responses of these whales to whale-watching vessel activity have documented impacts typical of disturbance behaviour in whales to the presence and approach of vessels, such as increases in swim speed and changes in swim path (Scheidat et al., 2004) and changes in surface behaviour activity (Corkeron, 1995). The behavioural response of cetaceans to vessels has been linked to the level of underwater noise generated by boats, which may be a source of disturbance to the animals (Williams et al., 2006; Bedjer et al., 2006b). A study by Au and Green (2000), however, did not support this hypothesis. In their study, Au and Green (2000) reported that underwater noise generated by five representative whale-watching boats off the coast of Maui likely did not have any significant biological effects on the auditory systems of humpbacks whales. This is congruent with findings reported by Nowacek et al., (2004) on the responses of North Atlantic right whales to vessel noise. The researchers measured the responses of the whales to controlled sound exposures, such as the recordings of ship

noise and a sound signal designed as an alert. Their findings indicate that the whales responded strongly to the alert signals (by swimming powerfully to the surface) but did not show any responses to the sounds of approaching vessels. The implication of these results for the whale-watching industry is that right whales may have a moderated response to underwater noise generated by tour boats.

The overall message of the findings reported in the literature is that whale-watching vessels and general vessel traffic can elicit a variety of responses from different cetacean species at different times and sites. This is best exemplified in the findings reported by Watkins (1986). Watkins (1986) studied historical records of humpback, finback, minke and right whale sightings off Cape Cod, Massachusetts and found that the behavioural reactions of the whales to human activities such as whale-watching tours and other boat traffic were generally mixed (i.e. positive, negative, and uninterested) and shifted with time (Table 2.7).

Table 2.7 Reactions of various species of whales in the North Atlantic to human activity over time (modified from Watkins, 1986, p. 254).

Species	**Before 1976**			**After 1976**		
Minke whale (n=18)	4P	3U	1N	2P	7U	1N
Finback whales (n=53)	0P	11U	15N	1P	20U	6N
Right whales (n=21)	0P	5U	5N	0P	5U	6N
Humpback whales (n=37)	6P	4U	8N	13P	5U	1N

"Positive" (P) reactions from the whales were characterized by the whales stopping their previous activities to either allow close approaches by vessels or to approach vessels themselves; "Uninterested" (U) reactions were those where human activity was apparently ignored and the whales carried on with their activities without

any evident changes in behaviour; "Negative" (N) responses included diving quickly, sudden changes from activity to inactivity and moving away from the stimuli.

It is also important to note that the presence of vessels is not the only variable that affects the behaviour of the focal wildlife. Indeed, an animal's behaviour and responsiveness to disturbance are also subject to social and physiographic variables, their physiological conditions and past experiences (Lien, 2001; Beale and Monaghan, 2004). Furthermore, in certain areas, the focal organisms of marine tourism activities are more exposed to other boat traffic (e.g. commercial fishing boats) than tour vessels (Williams et al., 2006). These additional factors compound the difficulties in assessing the true impacts of whale-watching vessels on the target species (Lien, 2001). More importantly, whether the short-term behavioural effects often cited in the literature will result in long-term biological impacts still largely remains as an uncertainty. Nevertheless, the literature demonstrates that whale-watching activity, particularly certain types of vessel conduct, can impact the target animals. These impacts, if unmanaged, may curtail the sustainability of the industry if the wildlife becomes displaced from the tourism site. Indeed, while whale watching is a non-consumptive wildlife use activity, it is not benign in terms of its potential to cause disturbance. It was therefore important to investigate the operators' and customers' assessment of vessel conduct during the tours to highlight potential areas in need of management attention.

2.6.3 Management

Although "management" is not specifically illustrated as a core component of the sustainable whale-watching tourism model (Figure 2.1), it should be noted that management is implicit to achieving each one of the dimensions that are depicted.

Indeed, the management of whale-watching activities in a particular tourism site is one of the most critical determinants of sustainability. There is strong consensus within the literature that if whale-watching as a commercial and recreational activity is to be sustainable, proper management is necessary (e.g. Duffus and Dearden, 1990; Orams, 1996; Duffus, 1996; Heckel, 2001; Lien, 2001; Berrow, 2001; Heckel et al., 2003; International Whaling Commission (IWC), 2004; Richter et al., 2006; Bejder et al., 2006b). The population-diminishing consequences of whaling and other human interaction with whales are, in large part, the reason why management of the whale-watching industry is necessary (Duffus and Dearden, 1990).

One of the most commonly cited models for the management of non-consumptive uses of wildlife is provided by Duffus and Dearden (1990), who propose that both the human user and the focal wildlife and habitat need to be understood and balanced in management strategies (Figure 2.3). According to the authors, management of the focal species often necessitates the collection of baseline information to understand the species and its habitat, and to set appropriate benchmarks to identify disturbance effects. For the human user, it is necessary to understand the type of individuals who participate in non-consumptive wildlife-based activities (e.g. specialist or generalist tourists) in order to set the appropriate level of management intervention.

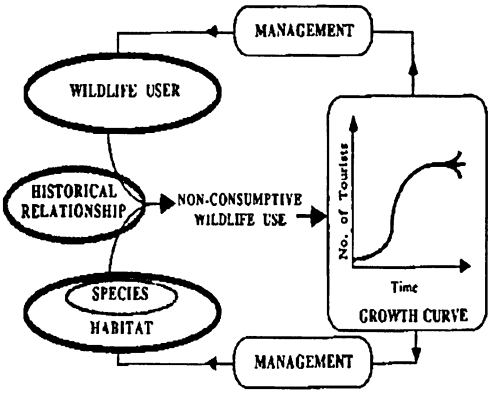

Figure 2.3 Core components of non-consumptive wildlife use
(Duffus and Dearden, 1990, p. 218)

2.6.3.1 The management of the whale-watching industry in Canada

Marine Mammal Regulations

The pertinent piece of legislation concerning cetaceans in Canadian waters is the *Marine Mammals Regulations* (*MMR*) (SOR/93-56), which was registered on February 4th, 1993 (Department of Justice Canada, 2007a). The scope of the *MMR* is outlined in section 3:

> These Regulations apply in respect of the management and control of
> (*a*) fishing for marine mammals and related activities in Canada or in Canadian fisheries waters; and
> (*b*) fishing for marine mammals from Canadian fishing vessels in the Antarctic.
> (*MMR*, Department of Justice Canada, 2007a, section 3)

Further reading of the *MMR* leads to their primary regulatory statement: "No person shall disturb a marine mammal except when fishing for marine mammals under the authority of these Regulations" (*MMR*, Department of Justice Canada, 2007a, section 7). The *MMR* then designate who, when, where, and in which manner marine mammals in Canada are to be harvested, sold and transported. Overall, the regulations are primarily relevant to

indigenous subsistence practices and are not suitable for non-consumptive uses such as whale watching (Spalding and Blumenfeld, 1997).

Whale-watching management programs

Whale-watching industries around the world are managed either through specific wildlife-viewing legislation (e.g. the *Marine Mammals Protection Regulations* in New Zealand) or voluntary guidelines (Carlson, 2007). For the most part, the management of the whale-watching industry in Canada has adopted the latter approach. Besides having to register and licence a commercial vessel with Transport Canada, no other specific permits are required to operate a commercial whale-watching vessel in Canada (Marine Services Online, 2007; Carlson, 2007). The sole piece of legislation that specifically pertains to whale-watching activities in the country is the *Saguenay-St. Lawrence Marine Park Act* and its *Saguenay-St. Lawrence Marine Park Regulations* (SOR/2002-76), registered in February 2002 (Carlson, 2007). The Regulations, which are a joint initiative between the federal government and the government of Quebec, only pertain to the Saguenay-St. Lawrence Marine Park. For the rest of Canada, the DFO has established a set of national voluntary guidelines for marine tour operators (Carlson, 2007) (Appendix A, Table A3). The guidelines indicate that operators should not "hunt, chase, follow, disperse, drive or herd pods or individual whales;" nor should they "disturb whales while they are resting, feeding and traveling" (Carlson, 2007, p. 27).

In addition to the guidelines issued by the DFO, operators in various parts of the country also voluntarily implement their own guidelines. In the lower Bay of Fundy, commercial whale-watching operators have a self regulating Bay of Fundy Whale-watchers Code of Ethics (Carlson, 2007) (Appendix A, Table A4). The objective of the

Code is to "foster an environment of cooperation and trust among marine tour operators for the safety and protection of the whales and other marine life" (Carlson, 2007, p. 28). The tour operators voluntarily sign and choose to adhere to the Code (Tobin, 2007). Similar to the DFO guidelines, the Code of Ethics outlines minimum approach distances, viewing priority, duration of viewing, the appropriate manner in which whales are to be approached and viewed in the wild, and the number of vessels watching a whale or group of whales at one time.

Amendments to the MMR

In the year 2000, the DFO commissioned Dr. Jon Lien, a scientist at the Memorial University of Newfoundland, to review the whale-watching industry in Canada and assess the need for regulatory measures (Hoyt, 2001). In his subsequent report, Lien (2001) adopted the precautionary approach in his recommendation that the DFO should initiate plans to manage the whale-watching industry, given the evidence that whale-watching vessels can elicit behavioural changes from the target animals which may in turn disrupt their ability to perform their necessary life processes (e.g. mating and foraging). Based on this assessment, in December 2002, the DFO released a bulletin announcing their intentions to amend the *MMR* to include non-consumptive uses such as wildlife viewing (DFO, 2002). After conducting consultations with members of the general public, tour operators and First Nations (all primarily in B.C.), the DFO released a draft version of the amendments in March 2005 (DFO, 2005). A summary of the proposed amendments can be found in Appendix A (Table A5). Based on a recent interview with Jerry Conway, the DFO Marine Mammal Advisor for the Maritimes Region, the specific provisions of the amendments are still "on-going" and will likely not

be consolidated for another 18 months (J. Conway, personal communication, April 20, 2007).

2.6.3.2 Tour operator endorsement of and adequacy of management programs

Whether the approach to whale-watching management is through legislation or voluntary guidelines, effective management is clearly reliant on the tour operators' endorsement for and adherence to the management programs during tours. Conformance to management regimes is therefore identified as a central aspect of sustainable whale-watching tourism. This topic has been studied by several researchers (e.g. Parsons and Woods-Ballard, 2003; Lalime, 2005; Whitt and Read, 2006). Their findings suggest that operator endorsement for and compliance with management programs is shaped and influenced by a number of factors, such as the specificity of the management program (e.g. local versus national), the belief in the fairness of the program, the behaviour of the wildlife, and the type of whale-watching vessel used. The compliance behaviour of operators with voluntary ecotourism guidelines has also been linked to the level of education the operators have received about the benefits of compliance and their level of familiarity with the guidelines (Sirakaya and Uysal, 1997). To determine whether the operators' endorsement of the current management programs in the lower Bay of Fundy is an agent of strength or vulnerability, it is necessary to gain an understanding of the operators' awareness and perceptions of the current management programs (i.e. the Bay of Fundy Whale Watchers Code of Ethics and DFO guidelines) and their attitudes towards the DFO's decision to regulate the whale-watching industry via legislation. From such data, implications can be drawn on the adequacy of present management regimes

and the ways in which the future management of the whale-watching industry can be effectively implemented.

2.6.4 Trends in the number and species of whale encounters

Operating a commercial whale-watching business requires a regular occurrence of the focal wildlife within a relatively limited spatial area (Duffus and Dearden, 1990). Consequently, whale-watching tourism usually develops in areas where there is a concentration of cetaceans (Duffus and Dearden, 1990; Lien, 2001). In fact, all whale populations in Canadian waters are found in concentrated regions of the marine environment, such as the head of the Laurentian Channel in Saguenay-St. Lawrence Marine Park in Quebec and the Witless Bay Ecological Reserve in Newfoundland (Lien, 2001). These areas are characterized by specific ocean habitat conditions (e.g. the availability of food, currents, temperature, salinity, water column stratification) which the animals need to perform certain life processes, such as foraging and feeding, mating, resting, and caring for calves (Lien, 2001; Baumgartner and Mate, 2005). Whale-watching tourism therefore typically coincides with areas on which the focal species are dependent to complete their life activities (Duffus and Dearden, 1990). The Bay of Fundy is one such area.

The Bay of Fundy attracts a wide variety of marine mammals (whales, seals and porpoises) and seabirds (e.g. common terns, arctic tern, razorbill, Atlantic puffin, herring gulls, Leach's storm-petrel, double-crested cormorant (Elliot et al., 1992; Diamond and Devlin, 2003)). The strong movement of tidal flow around the islands and across the bottom topology of the lower Bay of Fundy creates a number of tidal fronts and eddy systems that mix nutrient-rich water from the bottom of the ocean throughout the water

column (Andersen, 2004; Ingram et al., 2007). This promotes biological productivity, such as an abundance of phytoplankton and zooplankton, which then attracts other marine wildlife. The Bay of Fundy therefore serves as the summer feeding waters for several cetacean species, including the four focal whale species of the commercial whale-watching vessels in St. Andrews and the Fundy Isles (Ingram et al., 2007). These waters are where the whales gain sufficient blubber to last them through the winter months (Lien, 2001).

Since clumped distributions of cetaceans tend to be associated with specific habitat conditions, the prevalence of the animals within a given area is affected by natural or human-induced fluctuations in these conditions. To remain successful in encountering the focal wildlife, whale-watching vessels must respond to any spatial and temporal shifts in the locations of the animals (Duffus, 1996). Shifts in the distribution of the target wildlife away from tourism sites would clearly inhibit the sighting success of the operator. To evaluate the sustainability of the whale-watching industry in the lower Bay of Fundy, it is important to ascertain the trends in the location and occurrence of the target whales and the potential implications of these trends for the industry.

2.6.5 Marketing and advertising of the whale-watching industry

A key aspect of sustainable whale-watching tourism is the marketing of the tour businesses. Marketing of whale watching is important because it raises public awareness about the opportunities to view cetaceans (Warburton et al., 2001). Tour operators can market their businesses in a variety of ways: over the World Wide Web, on the radio or television, through local and national tourist boards, in travel guides and magazines, and through specialist tour companies (Woods-Ballard, 2000; Warburton et al., 2001).

Marketing can also include local and national advertisements in newspapers, road signs, posters, postcards, brochures/booklets, word of mouth and marketing groups (Woods-Ballard, 2000). However, such methods of advertising, especially on a national or international scale, can be expensive for individual tour operators (Warburton et al., 2001). Several authors have proposed that whale-watching operators in a given tourism site should establish coordinated marketing initiatives as a way of sharing the costs of advertising and promoting the industry on a larger scale (e.g. Warburton et al., 2001; Woods-Ballard et al., 2003).

Sustainable tourism development also requires that the marketing of a tourist activity is done responsibly (Hudson and Miller, 2005). The need for responsible marketing may be particularly applicable to the whale-watching industry as whale-watching advertisements typically feature spectacular and unlikely wildlife viewing experiences (e.g. breaching whales) which may lead the passengers to expect similar encounters (Neil et al., 1995). This may in turn affect customer satisfaction if expectations are not met during the tour. Neil et al. (1995) suggest that interpretive programs during tours can be useful in setting customer expectations to realistic levels. This suggestion is in line with Hudson and Miller (2005) who propose that a proactive responsible marketing system involves both high levels of environmental action by the tour company (e.g. encouraging employee environmental training and education, developing products/services in an environmentally sensitive manner) and communication of environmentally responsible practices and the concern for the resources involved to the customers (before and during their visit). The overall message from the literature is that marketing and advertising can enhance sustainable whale-

watching tourism if the industry is being well-marketed and cooperatively promoted, and if marketing is done in such a manner that does not encourage unrealistic customer expectations but instead raises customer awareness of management programs.

2.6.6 Number and flow of customers

Whale-watching participants are a fundamental component to operating a commercial whale-watching business; they are financial source of the tour company. The participants pay for the opportunity to encounter wildlife in their natural environment, typically to view, observe and photograph the animals (Duffus and Dearden, 1990). A consistent flow of individuals willing to pay for such experiences is thereby an indication of a viable tourism system. However, sustainable non-consumptive wildlife use is also subject to the ecological carrying capacity of the tourism site (Duffus and Dearden, 1990). Indeed, Orams (1996) notes that there is growing concern in the field of nature-based tourism over the impacts of high levels of tourist visitation to natural areas and the potential to disturb natural processes. In line with this reasoning, Duffus and Dearden (1990) propose that tourist demand for non-consumptive wildlife use activities has an influence on the natural site itself. The authors present a framework that links the wildlife specialization of the tourist to characteristics of the tourism site (Figure 2.4).

Duffus and Dearden (1990) posit that as tourism demand increases over time, there is an associated sequential change in the typology of tourists who engage in the activity (i.e. from wildlife specialists to general tourists). Coupled with this change in the user, the encounter site also evolves towards more infrastructure and an increased need for management intervention. Point (C) on the model may represent the stage where a maximum number of participants can be tolerated and the activity can still be sustained.

However, if this point is surpassed, the carrying capacity of the site may be violated to the point where the opportunity or quality of encounters with the wildlife is so diminished that visitor numbers begin to decline (D). On the other hand, the tourists may begin to exploit a different resource or attraction at the site (E).

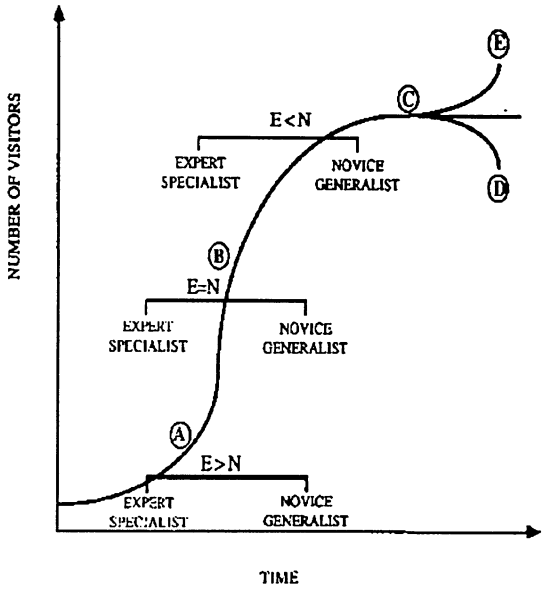

Figure 2.4 The relationship of user specialization and site evolution for non-consumptive wildlife use tourism
(modified from Bryan, 1977, 1980 and Butler, 1980 as cited by Duffus and Dearden, 1990, p. 223)

Although the objective of this paper is not to determine which point on the above model applies to the whale-watching participants in the lower Bay of Fundy region, the model is useful in illustrating that for a given tourist activity, like any other form of development, "uncontrolled growth is invariably destructive" (McHarg, 1969, p. 83). For a sustainable whale-watching industry, there must be a sufficient flow of customers to maintain the viability of the tour businesses, but the number of customers should also exist within the carrying capacity of the tourism site.

2.6.7 Customer satisfaction with the tour

Customer satisfaction with whale-watching tours has been investigated by several researchers (e.g. Woods-Ballard, 2000; Orams, 2000; Warburton et al., 2001; Birtles et al., 2002; Malcolm et al., 2002). Birtles et al. (2002) found that customer satisfaction with "swim with" dwarf minke whale tours in the northern Great Barrier Reef, Australia was significantly associated with the proximity of the whale encounters, the amount of time spent interacting with whales, the total number of encounters. These findings are somewhat consistent with Orams (2000). Similar to Birtles et al. (2002), Orams (2000) found that the presence and behaviour of whales were important influences on passenger enjoyment of whale-watching tours from the Tangalooma Island Resort in Queensland, Australia. However, the researcher also found that the geographical proximity to the whales was not a critical determinant of customer satisfaction; indeed, only four per cent of all the responses from the whale-watching participants regarding improvements to their tour experience were related to vessel proximity to the wildlife. The somewhat conflicting results reported by Orams (2000) and Birtles et al. (2002) are likely a reflection of the differences between "swim with whales" and whale-watching tourism experiences (Valentine et al., 2004). More importantly, their results highlight the complexity in understanding the variables that affect customer satisfaction and the underlying motivations to participate in whale watching or other tourism activities. Indeed, Orams (2000, p. 563) notes that "there is no widely accepted model that explains why humans choose particular activities for leisure or travel." The prevailing view in the literature, however, is that customer satisfaction and motivation to engage in wildlife-based tourism activities is influenced by a complex set of conditions, such as one's

personality, attitudes, affective response to the focal wildlife, environmental stimuli, physiological drives, and socio-economic status (Duffus and Dearden, 1990; Orams, 2000).

Although there may be a number of variables that affect customer satisfaction with whale-watching tours, ultimately, it can be said that these individuals are "engaged in a satisfaction-seeking behaviour" (Duffus and Dearden, 1990, p. 221). Consequently, achieving a high level of customer satisfaction is an indication that the primary purpose of the customers' participation in the wildlife viewing activity has been fulfilled. Customer satisfaction can also be utilized as an indicator of the quality of a product or service (Hayes, 1998). Satisfied customers are likely to repeat their visits and to recommend the product or service to friends and family (Woods-Ballard, 2000). Customer satisfaction can therefore have important economic consequences for the tour businesses.

2.6.8 Perceptions of the environmental and economic sustainability of the whale-watching industry

This particular variable was included in the research framework based on the research of Woods-Ballard et al. (2003). The researchers assessed the sustainability of the whale-watching industry in Scotland using tour operator perceptions of the economic and environmental viability of the industry. The operators were asked to describe trends in the number of tourists to their tours over recent years and trends in the number and species of marine mammals in their area. These descriptions formed the basis of Woods-Ballard et al.'s (2003) evaluation of marine tourism activities on the island. Drawing from this

research, the present paper also elicits similar information from the tour operators in the lower Bay of Fundy region.

Asking the operators for their opinions regarding the viability of the industry may also reveal important issues to the whale-watching industry in the region that are not captured by the research model; this makes the model flexible for new issues to be explored. One such an issue that can be readily identified by the researcher is the Liquid Nitrogen Gas (LNG) terminals that are currently being proposed in Maine, along the Passamaquoddy Bay, the coastal embayment at the south-western part of the Bay of Fundy (Conservation Law Foundation, 2006). There are presently three sites in Maine being proposed for the LNG terminals, although only two (Quoddy Bay LNG and Downeast LNG) have begun the approval process with the Federal Energy Regulatory Commission (FERC) in the U.S. (FERC, 2007). Both projects would consist of facilities to receive, store, and vaporize natural gas, as well as pipelines to deliver the gas to the available markets (FERC, 2007). The relation of these proposed LNG terminal sites to the whale-watching industry in the lower Bay of Fundy region is their proximity to the locations of the tour businesses, as shown in Figure 2.5a and 2.5b.

The terminals would reduce the area available for other local marine industries during the freighters' transit through the region (Conservation Law Foundation, 2006). Opponents to the sites have also noted that security measures, such as gunboats, surveillance and the requirement that citizens remain indoors, would compromise the appeal of the region (Kelly, 2005). The increased vessel activity may also affect the distributions of marine wildlife in the lower Bay of Fundy. Of course the LNG sites are still pending approval, but it is not unreasonable to suspect that the terminals may

potentially threaten the sustainability of the whale-watching industry in the study region. An LNG terminal has already been approved and construction begun in St. John, New Brunswick (Conservation Law Foundation, 2006).

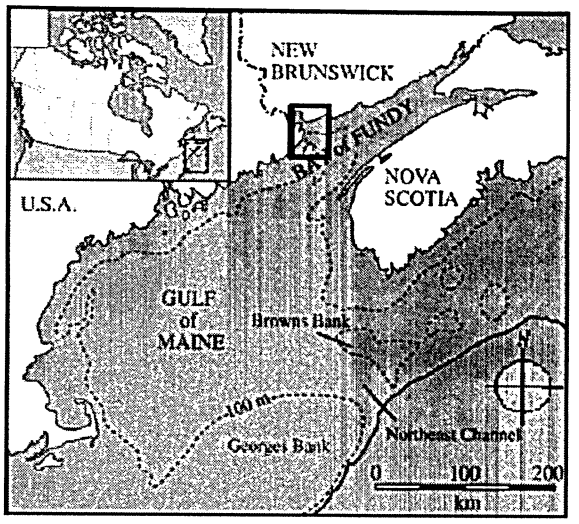

Figure 2.5a The Bay of Fundy, highlighting the study site at the mouth of the Bay *(modified from Dashtgard et al., 2007, p. 145)*

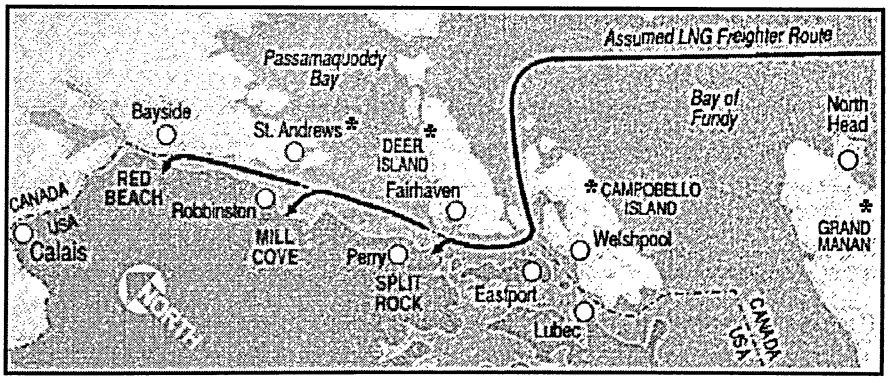

Figure 2.5b Proposed Liquid Natural Gas (LNG) terminal sites and assumed LNG freighter route; the asterisks represent the four study sites *(modified from Kelly, 2005, map from TODD Graphic)*

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study site selection

In selecting a focal region for this research, a number of factors had to be taken into account: the feasibility of conducting the study in that particular region, the availability of accommodations, budget and time constraints (e.g. having one month to collect the data), and resource constraints (e.g. having only one researcher). Two regions emerged as potential research sites: 1. the southern coast of B.C.; 2. the lower Bay of Fundy, New Brunswick. Both sites would have been interesting case studies. B.C., particularly the southern coast of the province, is one of the most developed whale-watching areas in Canada in terms of number of participants and total expenditure (Table 2.4); while the whale-watching industry in the Bay of Fundy region, as noted earlier, is not well-studied. Ultimately, the lower Bay of Fundy region was selected as the most feasible location for the study based on the above criteria. This decision was consolidated by the fact that the researcher has previous experience in the region, having taken a field course at the Huntsman Marine Science Centre in St. Andrews in the summer of 2004, during which the researcher also visited Deer Island and Grand Manan Island. The researcher's previous experience in these areas was particularly important to the decision to choose St. Andrews and the Fundy Isles (i.e. Deer Island, Grand Manan Island and Campobello Island) as the study sites. This familiarity with the region also proved to be especially helpful in navigating to the various locations during data collection.

3.2 Study site: The lower Bay of Fundy, New Brunswick

The study site, collectively termed "the lower Bay of Fundy region" for the purposes of this study, includes the commercial whale-watching businesses in the following four areas: St. Andrews, Deer Island, Campobello Island and Grand Manan Island (Figure 3.1). All four areas are located in New Brunswick's Charlotte County, which is in the south-western part of the province. The County is bordered by the state of Maine to the west and the Bay of Fundy to the south.

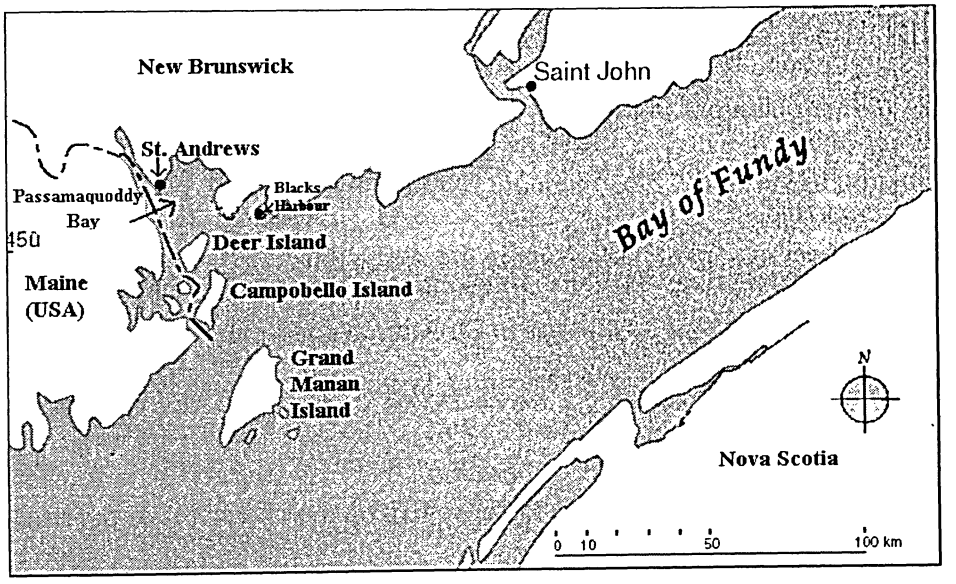

Figure 3.1 Relative location of St. Andrews, Deer Island, Campobello Island and Grand Manan Island *(modified from Hung and Chmura, 2006, p. 420)*

Deer Island and Campobello Island are located in the Passamoquoddy Bay, while Grand Manan Island is located in the mouth of the Bay of Fundy. Deer Island is the smallest of the three in terms of land area and population (New-Brunswick.net, 2007; Statistics Canada, 2007a), while Grand Manan is the largest and farthest offshore. St. Andrews was the only location included in the study that was not an island. Established by Loyalists from Maine in the 18th century, the town was designated as a national

historic site in 1988 (St. Andrews by the Sea, 2002). All four areas typify the small coastal communities in which whale-watching tourism often develops; each location has a population of less than 2,500 residents (Statistics Canada, 2007a).

3.3 Number of tour operators in study region and participation in the research

In total, there were 11 dedicated boat-based commercial whale-watching operations in St. Andrews and the Fundy Isles at the time of the data collection. With six operators, St. Andrews had the highest number, followed by Grand Manan and Campobello Islands, each with two tour operators, and Deer Island, with one (Table 3.1). In June 2006, tour operators from each of these businesses were contacted by telephone for participation in the study. The operators were highly cooperative in regards to the research; all of them agreed to participate in the study, thus the research encompassed the full population of marine tour businesses in St. Andrews and the Fundy Isles.

3.4 Approach to data collection

The approach to data collection is dependent on the objectives of the research itself. The aim of this study is to assess the sustainability of the whale-watching industry in the lower Bay of Fundy region by ascertaining areas of strength and vulnerability within the industry based on the perspectives of the tour operators and whale-watching customers. To achieve this objective, it was necessary to ask the operators and customers for their perceptions and attitudes regarding the various factors central to the sustainability of whale-watching tourism as discussed in the previous chapter. Consequently, semi-structured personal interviews with the operators and self-

administered questionnaires for the customers were selected as the most appropriate and feasible methods of data collection.

Table 3.1 Description of commercial whale-watching vessels for St. Andrews, Deer Island, Campobello Island and Grand Manan Island, New Brunswick

Tour company	Location	Name of whale-watching vessel	Passenger Capacity	Vessel type	Vessel length
Fundy Tide Runners Whale Watching and Nature Tours Inc.	St. Andrews	Tide Runner One	12	Zodiac	24 ft.
Island Quest Marine Ltd.	St. Andrews	Island Quest	44	Partially enclosed motor boat	38 ft.
Quoddy Link Marine Inc.	St. Andrews	Quoddy Link	47	Catamaran	55 ft.
Surge Tours	St. Andrews	Noteworthy	6	Open motor boat	24 ft.
Tall Ship/Jolly Breeze of St. Andrews	St. Andrews	Jolly Breeze of St. Andrews	40	Sailboat	72 ft.
Triton of the Bay Boat Tours	St. Andrews	Triton Tours	12	Zodiac	25 ft.
BillyMac Tours	Deer Island	The Craig C.	12	Open motor boat	40 ft.
Captain Riddle	Campobello Island	Brandello	10	Open motor boat	25 ft.
Island Cruisers	Campobello Island	The Mr. Matthew	20	Open motor boat	37 ft.
Sea Watch Tours Inc.	Grand Manan Island	Day's Catch	47	Open motor boat	45 ft.
Whales-N-Sails Adventure Ltd.	Grand Manan Island	The Elise Minota	46	Sailboat	Estimated 63 ft.

3.4.1 Ethics committee approval

Approval from the Ryerson University Ethics Review of Research Involving Human Subjects was sought for the personal interviews and customer questionnaires prior to the start of data collection. The committee requested that the purpose of the study and the risks of participation be appropriately communicated to the operators prior to the start of the interview itself. The committee also felt that it was unnecessary to ask the customers for their signatures upon participation in the study given that their identities would be kept anonymous. These requests of the Ethics committee were fulfilled and the research was granted approval. The researcher departed from Toronto, Ontario to St. Andrews, New Brunswick in August 2006 to begin data collection.

3.5 Semi-structured personal interviews

Outlined by Hague et al. (2004) (as cited in Szwarc, 2005, p. 47), an in-depth interview can be a suitable research approach in the following conditions, all of which are applicable to the present research:

- If it is important to avoid other people influencing the responses given by an individual;
- When the aim is to collect individual case stories from an individual;
- Where significant comment is needed from an individual;
- Where the topics discussed are sensitive.

Specifically, this research adopted a semi-structured personal interview approach, with the use of an interview guide. This approach allows the researcher to ask follow-up questions and explore issues that are brought up during the interview itself (Szwarc,

2005). This allows for a free range of thought during the interview and greater flexibility over a structured interview format. Furthermore, personal interviews have several advantages over other research methods. For instance, building a rapport with the interviewee is more easily accomplished in a personal interview than a telephone interview (Szwarc, 2005). Building a rapport with the operators was especially important to this research given that much of the information collected was personal and potentially involved business confidentiality.

On the other hand, it is important to note that there are also several disadvantages to the personal interview approach. For example, conducting personal interviews tends to be more expensive than other data collection methods, such as telephone or mail-in surveys (Szwarc, 2005). Moreover, personal interviews may also be influenced by social bias; as in, respondents providing the type of answers they feel the interviewer wants to hear, or answers that are thought to be "socially correct," rather than their own honest feelings (Szwarc, 2005, p. 132). The benefits of conducting personal interviews, however, were deemed by the researcher to outweigh these limitations.

3.5.1 Tour operator interview guide design

The questions for the interviews were constructed with guidance from previous relevant research (e.g. Woods-Ballard et al., 2003; Parsons and Woods-Ballard, 2001) and to reflect the core objective of the research. The ten page interview guide was categorized into various sections. All of the questions within the interview guide were open-ended. The sections were generally ordered using the funnelling technique, from general to more specific questions (Sudman and Bradburn, 1982). The guide began with simple, general questions about the tour operator's background and company history.

This was done to establish a rapport with the tour operators and encourage them to be communicative and expressive. Indeed, according to Statistics Canada (1979), the first set of questions during an interview should be sufficiently easy so that respondents can confidently proceed. After the introductory section, questions related to vessel maintenance and repair and a "typical" whale-watching tour followed. Attention then shifted to questions regarding the customers (e.g. within season and between season trends in customer numbers, customer expectations and behaviour during tours). Following this section on the customers, the operators were asked about variables in the natural environment, such as trends in the number and species of whale sightings, any changes that they have observed in the ecosystem of the Bay of the Fundy over their years in operation, and the effects of weather conditions on their tours. The penultimate section of the interview guide contained questions related to the management of whale-watching activities, including tour operator perspectives on the conduct of commercial whale-watching vessels in the region, and their awareness of and endorsement for management initiatives. Finally, the interview guide ended with questions on the economic or financial aspects of running a commercial tour business, including questions on marketing and advertising and the effects of competition from the other whale-watching operators in the region. These questions, deemed to be of a sensitive nature, were grouped together and placed at the end of the interview (Statistics Canada, 1979). The tour operator interview guide is appended in Appendix B.

3.5.2 The tour operator interviews and transcription processes

Conversational style personal interviews were conducted with the tour operators from the dedicated commercial whale-watching operations in St. Andrews, Deer Island,

Campobello Island and Grand Manan Island. The interviews occurred between August 2006 and February 2007. All, but one of the interviews, were conducted in person in the business offices or homes of the tour operators in August and September 2006, during which the researcher stayed at the Huntsman Marine Science Centre in St. Andrews. The last operator interview was not conducted in person but by telephone in February 2007. This was primarily because the operator sustained an injury on the original date of the interview, which was scheduled to be in St. Andrews in September 2006, prior to the departure of the researcher from the study region. Scheduling conflicts between the researcher and the operator in the subsequent months after the researcher's departure led to a delay in the interview date until February 2007.

With the permission of the operators, each interview was taped with an audio cassette recorder. The recorded interviews were then transcribed onto a computer-based document.

3.5.3 Limitations of tour operator interview design and process

Perhaps the most notable issue during the tour operator interviews was the length of the interview itself. It took approximately one hour to complete each interview. Though the tour operators were highly cooperative during the interviews, indeed, only one tour operator refused to answer a question, the length of the interview may have affected the candour of the tour operators' responses, especially towards the end of the interview. In fact, a few of the operators made remarks, albeit jokingly, about the length of the interview. For future research of this nature, it is recommended that each interview adhere to the 45-minute limit advised by Szwarc (2005).

Other limitations with the tour operator interview guide emerged from the questions in which the tour operators were asked to describe trends and changes in the whale-watching industry that they had observed over the years. Clearly, the ability to answer these questions is limited by the number of years in which the operator has been running whale-watching tours. This limitation was especially evident during the interviews with the operators from the younger tour businesses. Furthermore, it is important to note that the whale-watching tours are only conducted during daylight, and the areas frequented by the tour operators for whale watching by no means entirely encompass the total area covered by the whales. Therefore, the answers provided by the operators pertain only to the particular geographic scope and timeline of their respective tours.

3.6 Customer questionnaires

Questionnaires were distributed to customers of the whale-watching businesses participating in the study. Due to time and resource constraints, it was clearly not practical to request every whale-watching customer from each of the tour businesses for a personal interview. Self-administered questionnaires from a sample of the whale-watching public therefore provided a useful and feasible way of collecting information that could undergo statistical analysis (Ryan, 1995). Moreover, the survey approach is a well-known and commonly used method of gathering information on the perceptions and knowledge of whale-watching customers (e.g. Neil et al., 1995; Orams, 2000; Warburton et al., 2001; Birtles et al., 2002; Malcolm et al. 2002; Woods-Ballard et al., 2003). Many of the questions in the survey were based on these previous studies.

3.6.1 Survey question and response format

The 22-page customer questionnaire was equally divided into two parts: a pre-tour segment of questions and a post-tour segment (Appendix B). In each section, there was a combination of dichotomous scale, nominal scale, ordinal scale and open-ended response choices. The majority of the questions, however, were constructed for dichotomous scale and nominal scale responses. These included questions on previous whale-watching experience, awareness of management initiatives, expectations prior to the tour and experiences during the tour, as well as all questions requesting demographic information, for which nominal scales were the most suitable response format (Rodeghier, 1996).

Three-point and five-point Likert scales were used to elicit customer ratings of various aspects of the whale-watching tour, including: motivations to participate in whale watching; the importance of seeing a whale; how well the tour experience matched expectations; how well the tour was managed by the operator; the quality of information received about the wildlife; and the overall satisfaction with the tour. These questions were well-suited for Likert scales because they asked respondents to evaluate a particular aspect of their tour (Rodeghier, 1996). Indeed, Likert scales are commonly utilized response choices for evaluation-type questions and have the particular advantage of allowing individuals to express the level of their opinion (Statistics Canada, 1979; Hayes, 1998).

Open-ended response formats were used for questions where the potential responses could not be predicted or the potential number of responses was too many to list. These included questions on the customers' general awareness and knowledge of

management practices and customer perceptions of the conduct of the whale-watching vessels. However, open-ended questions were kept to a minimum to reduce the completion time of the survey and because answers to open-ended questions are more difficult to code and statistically analyse than closed-ended questions (Rodeghier, 1996).

3.6.2 Questionnaire design

The customer survey was developed to reflect the practices of good questionnaire design and formatting. For instance, the opening paragraph of the survey contained the name of the researcher, the title and purpose of the research, a request for participation and general completion instructions (Statistics Canada, 1979). Moreover, important words or phrases within the questions were underlined (Statistics Canada, 1979). Sub-titles were also used to group questions into distinct sections and related questions were asked in blocks (Sudman and Bradburn, 1982). The questions were numbered and letters were used for sub-parts (Sudman and Bradburn, 1982). Due to travel constraints, the surveys could not be pre-tested on the target population prior to sampling. The questionnaires were therefore pre-tested on colleagues and professors, some with previous whale-watching experience, for its comprehensiveness, clarity and formatting. Recommended changes were applied to the questionnaires before the final draft was printed.

The pre-tour component of the survey probed the customers' views on the environment and their concern for whales, previous commercial and non-commercial (recreational) whale-watching experience, awareness of management practices, motivations in participating in whale watching and their beliefs, preferences and expectations regarding the species and behaviours of the whales they would potentially

encounter. The post-tour section asked the respondents to relay their experiences on the tour and rate various aspects of the tour (e.g. how well the tour met their expectations, tour operator management of the tour and their satisfaction with the tour). Demographic information was requested at the end of the questionnaire, again because of the sensitive nature of such data.

3.6.3 Questionnaire target population and sampling

The target population for the questionnaires was adult (18+) customers from the commercial whale-watching business participating in the study. A convenience sampling method was employed to select individuals from the population and request participation in the study. Convenience sampling has been utilized in other tourism-related studies (e.g. Chang and Hsieh, 2006; Ryan and Huyton, 1998). Nonetheless, one of the limitations of convenience sampling as a non-probability sampling technique is that it diminishes the capacity to make inferences about the value of a particular variable in the population based on statistics from the sample (Rodeghier, 1996). Despite this limitation, convenience sampling was the most feasible and realistic sampling method available.

The researcher approached the customers as they gathered at the wharf or offices of the whale-watching businesses prior to a tour. This was helped by the fact that all of tour businesses request that their customers report to the offices or wharf at least half an hour before the start of the tour. Consequently, the researcher had ample time to request participation from the customers before their tour began. When asking for cooperation in the study, the researcher introduced herself and her school affiliation and briefly discussed the purpose of the research, the voluntary nature of participation in the study, and the completion instructions for the survey. Efforts were made to approach men and

women equally and individuals from different age groups. Efforts were also made to randomize the selection process as much as possible. For example, if a group of customers had gathered at the wharf or office, the researcher would approach every fifth person from a particular reference point (e.g. the office door). For some of the businesses, the office personnel helped by asking the customers to join in the study as they came to pay for their tours.

3.6.4 Questionnaire completion

The instructions for the questionnaires were similar to the procedure used in a study conducted by Neil et al. (1995), where researchers also designed a pre-tour and post-tour questionnaire to investigate the effects of previous whale-watching experience. Consenting customers were asked to complete the pre-tour component of the questionnaire immediately (i.e. before the whale-watching tour began or as the vessel was leaving the dock before the first whale encounter). The participating customers were then asked to complete the second part of the survey after the whale-watching tour ended (i.e. on the way back from the tour as the vessel docked again or in the offices of the whale-watching businesses after docking). To ensure consistency and track the surveys, each questionnaire was numbered in the order in which they were given out as recommended by Ryan (1995, as cited by Birtles et al., 2002).

Two of the tour companies included in the study use zodiacs as their whale-watching vessels. These businesses require that customers wear full-length floatation devices during the tour. Consequently, the customers had to return to the offices after the tour to hand in their suits. Moreover, given the limited space available on these zodiacs (these are amongst the smallest whale-watching vessels in the region; Table 3.1), as well

as the open design and speed with the zodiacs travel, it was best for the customers from these two tour businesses to complete the pre-tour and post-tour components of the surveys at the business offices; as such, all the completed questionnaires were returned by the customers to the researcher at the office. For the remaining tour businesses, the participating customers handed in their completed surveys to the researcher at the wharf, where the researcher would be waiting as they disembarked from the whale-watching vessels.

3.6.5 Number of questionnaires obtained

Prior to sampling, a target of 300 completed questionnaires was established as an attainable goal within the sampling period (August 13 to September 8, 2006). Given that each tour vessel can accommodate a different number of passengers, a formula was used to ensure that the smaller vessels were not under-represented. The formula (Equation 3.1) used was based on the square root of the maximum number of passengers for each vessel and the target of 300 total questionnaires:

$$N = (\sqrt{C} \times 300) / \Sigma \sqrt{C} \qquad \text{(Equation 3.1)}$$

where,

N = Target number of surveys for each tour company

C = Maximum capacity of tour vessel

One of the tour businesses in the region operates two vessels. However, according to the tour operator, only one of the vessels is used predominantly for whale watching. Therefore, the target number of surveys for this company was based on the maximum capacity of the one vessel and only customers from this vessel were surveyed.

Another one of the companies was not running whale-watching tours during the time of data collection because the operator was replacing the engine of his tour vessel. Therefore, customers from ten of the 11 total tour businesses in the study region were sampled. The operator from this company was still interviewed since he was still involved in the commercial whale-watching business.

A total of 274 questionnaires were distributed during the sampling period. Of the 274 distributed questionnaires, three were returned entirely incomplete and 11 were never returned to the researcher; thus 260 questionnaires were collected from 61 vessel trips, falling 40 surveys short of the target (Table 3.2). However, nine of these questionnaires were returned partially incomplete (i.e. all or most of the pre-tour or post-tour questions were unanswered). Nonetheless, these nine questionnaires were included in the analyses to avoid the loss of data for the parts of the surveys which were completed.

Table 3.2 Number of questionnaires obtained for the sampling period of August 13 to September 8, 2006

Vessel	√ Maximum number of passengers	Target number of surveys	Number of surveys obtained (number missing and entirely incomplete)	(Number obtained) – (Number required)	Number of tours on which surveys were collected
A	3.46	20	22 (1)	+2	7
B	6.86	40	41 (1)	+1	10
C	4.47	26	22 (1)	-4	5
D	3.46	20	2	-18*	1
E	6.78	40	33 (8)	-7	4
F	6.86	40	40	0	4
G	3.46	20	22	+2	7
H	6.63	39	40 (2)	+1	11
I	6.32	37	36 (1)	-1	10
J	3.16	18	2	-16*	2
TOTAL	**51.46**	**300**	**260 (14)**	**-40**	**61**

3.6.6 Problems encountered during questionnaire data collection

There were a few problems encountered during data collection. For two of the businesses (vessels D and J marked by the asterisk in Table 3.2), the number of questionnaires obtained was far below the number required. The main reason for this discrepancy was the lack of business flow to these particular companies during sampling periods. Travel distance also compounded the difficulties in collecting surveys from the two businesses. Despite these setbacks, however, the data collection process was fairly successful and the customers were generally cooperative.

3.6.7 Questionnaire data preparation and data entry

Rodeghier's (1996) book on survey research using the statistical package SPSS® provided much guidance during the data preparation and data entry process. Each response choice on the questionnaire was numerically coded, with the same numeric values for similar responses. Responses from each of the questionnaires were inputted into a Microsoft Excel spreadsheet and later transferred into an SPSS® data file. Responses to open-ended questions were not coded but were instead described qualitatively. The questionnaires were continually checked for errors during data entry and any noted errors were corrected. For example, the consistency of the questionnaires was checked to ensure that respondents who were ineligible to answer a particular question did not answer it (e.g. if a respondent indicated that they did not have any previous commercial whale-watching experience, the survey was checked to make sure that the respondent did not answer any of the follow-up questions regarding previous commercial whale-watching experience). After the initial data entry phase, the entire

spreadsheet was re-examined against the original questionnaires to ensure accuracy and minimize non-sampling error.

3.6.8 Problems encountered questionnaire during data entry and in relation to response rate

During data entry, a few noteworthy problems were encountered with several of the questions. Most notable amongst these were the following questions: 1. Pre-tour 22, which asks the respondents to identify the primary reason why they chose their particular tour operator; 2. Pre-tour 26, which asks the respondents to choose their most preferred whale species from a list; 3. Post-tour 34a, which asks the respondents to identify the source from which they first became aware of the whale-watching opportunities in the region; and 4. Post-tour 34b, which asks the respondents to identify the source from which they first became aware of their particular tour operator. These questions required the respondents to provide only one answer. However, during data entry, it became apparent that a number of the respondents did not follow these instructions and provided more than one response. As such, these questions were not entered as variables in the spreadsheet but were instead counted manually. For these questions, each answer provided by the respondent was equally weighted out of the total number of responses selected. For instance, if the respondent selected three choices within the response list, each response was weighted as 1/3. Therefore, for each of these questions, the total weight of the responses from each customer was always one. All the recorded values for each response category were then summed and thereby, the total number of responses for each response choice was obtained. Results from these particular questions were reported

through counts and percentages; these questions were not included in any computer-based statistical analyses.

It was also observed during data entry that the non-response rates of the questions generally increased towards the end of the questionnaire. Indeed, for the first ten questions on the survey, an average of only 2.2 per cent of the respondents did not provide a response, while the same percentage for the last ten questions which were applicable to all respondents was 5.6 per cent. This, however, is hardly a significant non-response rate. Nonetheless, it is important to comment on the difference in response rates between the beginning and end of the survey. The difference may be due to the length of the questionnaire itself. In fact, like the tour operator interviews, there were a few complaints about the length of the customer questionnaires. This is one of the reasons behind placing the demographic information, of less importance to the primary research objectives, at the end of the survey.

The response rates for the open-ended questions were generally well below those for the close-ended questions. For example, question 15 of the post-tour component of the survey asked respondents whether their concern for the welfare of whales had changed since taking the tour, with a dichotomous scale, "yes" or "no", response format. This was then followed by an open-ended question asking those individuals who had answered affirmatively to specify why the tour had caused their concern to change. Although, 63 individuals answered affirmatively to the question, only 35 responses were recorded for the ensuing open-ended question, for a response rate of 55 per cent. This pattern was generally consistent for the other open-ended questions in the survey. Again,

the length of the survey may have contributed to this trend by discouraging the respondents from writing down an answer.

3.7 Analyses: Tour operator interviews and customer questionnaires

Tour operator interviews

After all the tour operator interviews had been transcribed, the responses provided by the operators were grouped into similar categories. For example, all the responses to question one on the interview guide were categorized into one document; the same was done for question two, and so on. This made it easier to find trends or differences in the operators' responses. Observed trends and differences within each set of responses from the operators were further categorized according to the factors listed in the research framework (Figure 2.1). Given that much of the data collected were opinion based, efforts were made to report the findings in the words of the operators in Chapter five. Where appropriate, results from the customer questionnaires were used to supplement or contrast responses from the operator interviews. Key conclusions were then drawn on the sustainability of commercial whale-watching activities in the lower Bay of Fundy region from management, environmental and economic perspectives. These conclusions were then related to the findings from related studies on whale-watching tourism and wildlife-based tourism in general. Through these comparisons and insights drawn from the data, areas of strength and vulnerability within the whale-watching industry in the lower Bay of Fundy emerged.

Customer questionnaires

The statistical analyses conducted on the questionnaire results were based on the research objectives and the nature of the survey data. The nominal and ordinal scale

format of the response choices in the questionnaire negated the suitability of parametric statistical tests. Therefore, counts and percentages formed the core of the data analyses.

CHAPTER FOUR

PROFILE OF THE RESEARCH PARTICIPANTS

4.1 Introduction

This chapter presents a profile of the research participants (i.e. the tour operators and the whale-watching customers). The overall descriptions and discussions provided here are meant to familiarize the reader with the research participants and serve as a basis for analyses presented in Chapter five. Where appropriate, the findings are compared to available data on general tourists to the Province of New Brunswick and to results from similar studies on commercial whale-watching tour operators and participants in Canada and in other parts of the world (e.g. Scotland and Australia).

4.2 Profile of the tour operators and their operations

Introduction

Thirteen individuals were interviewed from the 11 whale-watching tour businesses in St. Andrews and the Fundy Isles (for two separate interviews, two individuals participated in each). Most (N=10) were the vessel operators; two were the vessel engineers and one was a tour guide and administrative personnel. All of the interviewees were the primary or part business owners of their respective marine tour companies. For the purposes of this paper, all of the interviewees will be referred to as tour operators. Given that only one individual provided an answer to each question, for the interviews where there were two customers, the pair is regarded as one operator. All, except one, of the interviewees were male.

Background of the tour operators

Most of the operators (N= 9) had no formal training or background in business management or wildlife tourism. Only two of the tour operators had a past history specific to commercial marine tour activities before owning a whale-watching business. Over half of the operators (N=6) were or are still involved in the local fishing and/or aquaculture industry in addition to running whale-watching tours. This reflects the fisheries-based communities in which the tour operators run their businesses and is also "indicative of areas where traditional employment such as fishing...are proving to be unprofitable and rural people have to diversify in order to provide for themselves and bring income from outside the community" (Woods-Ballard et al., 2003, p.47). Indeed, according to Hoyt (2001), the continued development of the whale-watching industry in Canada throughout the 1990s is reflective of a general trend in coastal communities across the country to develop tourism opportunities as other resource-based sectors have declined.

When asked about how they became involved in the whale-watching industry, the tour operators provided a variety of answers (Table 4.1). Despite the range of responses, many of the operators (N=6) expressed a love of the marine environment, of boats and boating and a familiarity with the local area.

Table 4.1 How the tour operators became involved in the commercial whale-watching industry (N=11)

---

1. Had a history in the local fisheries but because of the struggles of the fishing industry or lack of interest in continuing fishing, whale watching presented a new opportunity to own a boat and be on the water.....3
2. Became involved in the industry out of an entrepreneurial spirit to own a

business and saw an opportunity in whale watching as a means to do so.....3

3. Took over ownership from a previous business owner or from a family member.....2

4. Became involved in the industry serendipitously.....1

5. Became involved in the industry out of research interests in whales and a love of boats, water and wildlife.....1

6. Became involved in the industry as an easy way to make money.....1

Whale-watching tour businesses

All of the businesses are seasonal, reflecting the seasonal changes in the distribution and occurrence of whales in the coastal waters of the lower Bay of Fundy and the fluctuations in the tourist demand for whale watching. Most of the tour companies (N=10) are in operation for only three to four-and-a-half months per year (primarily during the summer months, i.e. July, August and September, to coincide with the prevalence of the whales in the region).

The businesses are generally small-scale. Six operators support five or less full-time and/or part-time staff. The remaining five businesses employ five to ten full-time and part-time individuals. The biggest businesses, in terms of vessel capacity and number of staff, are in St. Andrews and Grand Manan Island.

On average, the tour operators on Grand Manan Island have been in the whale-watching business the longest (Table 4.2). At the time of data collection, the mean number of seasons in operation for all the operators interviewed was 8.2. This suggests that the tour businesses in the region are fairly well-established.

Table 4.2 Mean number of seasons in operation at the time of data collection according to location (N=11) (the tour operator on Deer Island was combined with the two operators on Campobello Island to facilitate the comparisons)

St. Andrews (n=6)	7.8
Deer Island and Campobello Island (n=3)	7.7
Grand Manan Island (n=2)	10
Mean	8.2

Descriptions of a "typical" whale-watching tour

The nature of the whale-watching tours in St. Andrews and the Fundy Isles can be separated into three categories, based on the answers provided by the operators when asked to describe a "typical" whale-watching tour (Table 4.3). The first category of tours appear to be more focused on viewing whales, with less emphasis on the other local attractions and wildlife (as in, viewing other attractions may or may not occur based on passenger interest). On the other hand, tour operators belonging to the second category of tours stressed the importance of incorporating the local area landscape, seascape, industries and wildlife into their whale-watching tours. According to these operators, the other local attractions add additional value and diversity to the whale-watching trips and are especially relied upon when no whales are encountered or when there are "poor quality" whale sightings (e.g. distant encounters) on a given tour. For the third category of tours, the operators placed an emphasis on the entertainment value of the tour, noting that although viewing whales is important, entertaining the passengers (e.g. by being jovial or providing amenities such as food and alcohol) is also a key aspect of the whale-watching experience. According to one of these operators, "what people really want at the end of the day is overall entertainment."

Table 4.3 Descriptions of a "typical" whale-watching tour in St. Andrews and the Fundy Isles (N=10)

1.	Depart office/wharf; safety briefing before or immediately after departure; travel to/search for whales; view whales; may include stops to view other marine life (e.g. seabirds) if there is interest; travel back to wharf.....3
2.	Depart office/wharf; safety briefing before or immediately after departure; view local landscape (e.g. lighthouses); view other local marine wildlife (e.g. seabirds and seals); travel to/search for whales; view whales; view other local industry (e.g. salmon cages); travel back to wharf.....5
3.	View whales and other wildlife but entertainment is key.....2

In addition to running whale-watching trips, eight of the operators in the region also offer other forms of marine tours, such as scenic or sunset tours, fishing trips, bird-watching tours, and ferry trips from the mainland to the islands either throughout the season or at the beginning of the season before the arrival of whales in the region. Offering a selection of tours provides the tour operators with an additional source of revenue which can sustain the business especially if the demand for whale watching is low, as was the case with one operator in particular. This also enhances the resilience of the tour businesses to "fluctuations in any one particular niche market [or species] and [allows them] to quickly take advantage of growth markets" (Warburton et al., 2001, p. 75). Having a variety of marine tours may also be an additional way for the tour operators to earn a return on their investment in starting up and maintaining a tour business (e.g. purchasing a vessel, advertising, safety and navigational equipment) (Warburton et al., 2001).

On the other hand, the diversity in the types of tours offered by the operators also "raises the question as to whether or not small-scale private operations can survive

strictly as specialized providers of [whale-watching] opportunities" (Weaver et al., 1996, p.140). Adding further weight to this question is the fact that the majority of the operators indicated that they have additional sources of income besides whale-watching tours (N= 7). Consequently, it may be more appropriate to view the typical whale-watching business in the lower Bay of Fundy region as more of a "tourism hybrid" (Weaver et al., 1996, p.140).

Target species

The three most commonly sighted whale species for operators in St. Andrews, Deer Island and Campobello Island are finbacks, minkes and humpbacks. According to the tour operators in these areas, minkes are usually the first to arrive in the area (e.g. in June), followed by finbacks (toward the beginning of July) and then humpbacks (beginning-mid August).

For the Grand Manan Island tours, the three most frequently encountered species are finbacks, humpbacks and right whales. According to the operators on the island, the arrival of the right whales and humpbacks vary from year to year and within a season (based on the location of food), but the finbacks are more prevalent or "dependable" throughout the season. The geographical location of Grand Manan facilitates the sightings of right whales, which tend to feed in the Grand Manan Basin in the lower Bay of Fundy between Grand Manan and Nova Scotia (Woodley and Gaskin, 1996; Durbin et al., 2002).

4.3 Profile of the whale-watching customers

4.3.1 Demographics of the whale-watching customers

Age and gender

Of the 260 customers, 56.1 per cent were female. This is consistent with the results from several related studies which also report more female whale-watching participants than male (e.g. Neil et al., 1995 (62 per cent female); Warburton et al., 2001 (51.4 per cent female); Malcolm, 2005 (57 per cent female)).

Slightly over half of the customers (53.7 per cent) reported that they were mature adults (31-55 years old) (Figure 4.1).

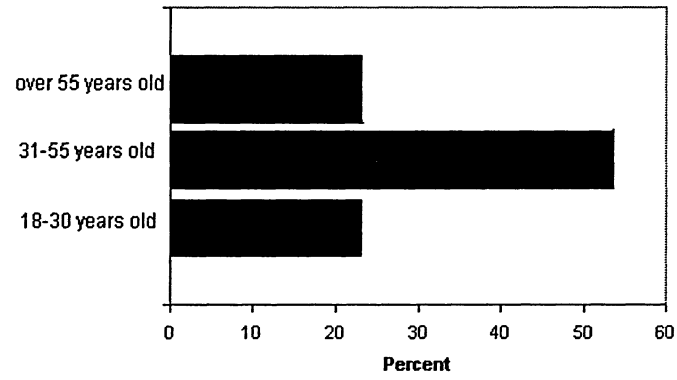

Figure 4.1 Age classification of the whale-watching customers (N=246)

Level of education

The results indicate a highly educated survey population. Indeed, most of the customers (83.7 per cent) reported that they were either college, university or post-graduate university graduates (Figure 4.2). This is a relatively high level of formal education in relation to the general New Brunswick tourist population. For example, a recent profile of visitors to the province by the Department of Tourism and Parks showed

that 15 per cent of tourists during the year 2005 reported that they had post-graduate university degrees (New Brunswick Department of Tourism and Parks, 2006b). In comparison, nearly one third of customers (32.9 per cent) in this present study indicated that they had similar qualifications.

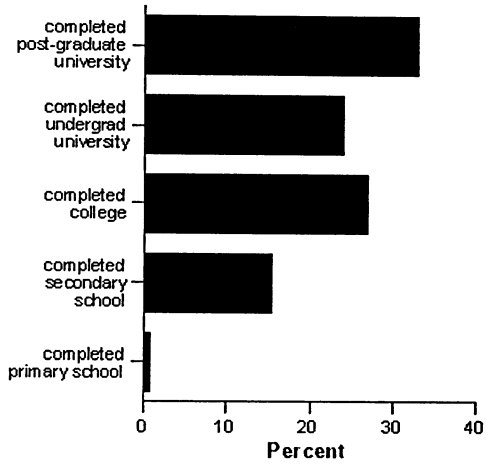

Figure 4.2 Highest level of education completed by the whale-watching customers (N=246)

The educational qualifications of the customers suggest that their level of general knowledge and level of income are also high (Warburton et al., 2001). The affluence of individuals who participate in whale-watching activities has been documented in other studies. For instance, Warburton et al. (2001) found that the vast majority of whale watchers (89.4 per cent) surveyed in West Scotland were in the upper or middle socio-economic class. The authors suggested that "whale watching as an activity may appeal to those of a higher social class or perhaps the relatively high price of whale-watching trips in comparison to other excursions means that visitors with less disposable income are less able to afford the trips" (Warburton et al., 2001, p.23). The price of a whale-watching

tour in the study region ranges from $43.50 to $60 (adult), with a mean price of $48.65 (adult).

Length of stay

The largest percentage of customers (42.2 per cent) indicated that they were visiting St. Andrews and/or the Fundy Isles for one to three days; while about a quarter of the customers (27.1 per cent) can be classified as excursionists (i.e. reported that they were visiting for less than a day) (Figure 4.3). These results indicate that in general, visitors to the region stay for relatively short periods of time, which also suggests that people come to the region specifically for whale watching.

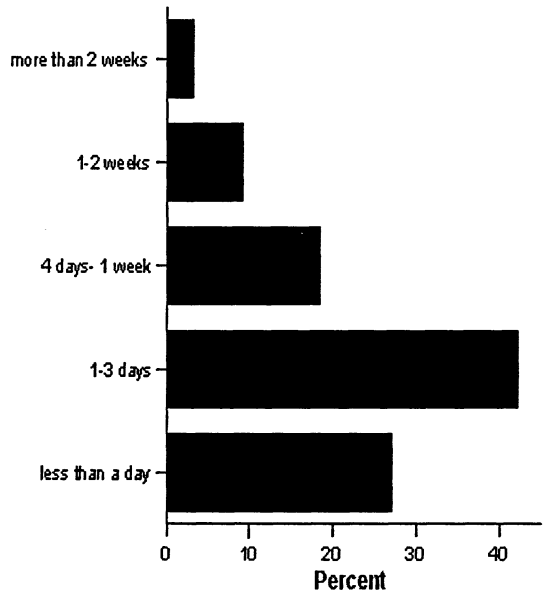

Figure 4.3 Length of current visit to St. Andrews and/or the Fundy Isles as indicated by the whale-watching customers (N=218)

Travel origin

Most of the customers (95.6 per cent) indicated that they were visitors (i.e. non-residents) to St. Andrews and/or the Fundy Isles. A fair proportion (42.9 per cent) also

reported that they had previously visited the region. This suggests that whale watching appeals to both new and repeat visitors.

In terms of travel origin, the largest percentage of customers reported that they had traveled from Ontario (28.3 per cent), followed by those traveling from within New Brunswick (20.0 per cent), and from the North-eastern U.S. region (19.6 per cent). Nearly 30 per cent of the customers indicated that they had traveled from the U.S. (Figure 4.4).

A publication released by the New Brunswick's Department of Tourism and Parks in 2004 identified Ontario, Quebec, the Maritimes, and the Eastern U.S. as the core tourism markets for New Brunswick. According to the publication, each market accounts for nearly 25 per cent of the total visitation to the province (New Brunswick Department of Tourism and Parks, 2004a). The findings presented here are roughly consistent with the proportional representation of each of the four regions cited above, except the Quebec market, which is relatively underrepresented in this research. Indeed, travelers from Quebec accounted for only three per cent of all the customers. The fact that the questionnaires were only available in the English language and that the researcher was not fluent in French likely contributed to the under-representation of Quebec tourists in the study. Another potentially contributing factor is related to more recent figures on tourist visitation to New Brunswick, which indicate that the number of Quebec travelers to the province declined by 10.9 per cent in 2006, the year in which the survey sampling was conducted (New Brunswick Department of Tourism and Parks, 2007a). This decline may have exacerbated the under-representation of respondents traveling from Quebec.

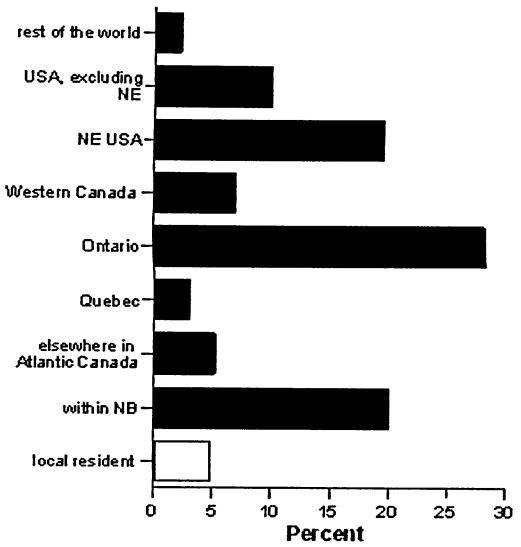

Figure 4.4 Travel origin of the whale-watching customers (N=230)

Figure 4.4 illustrates that tourists to St. Andrews and/or the Fundy Isles generally come from areas which are in geographical proximity to the region. Indeed, excluding the U.S., less than five per cent of the customers in this study were international travelers to the region. These travelers, making up the "rest of the world" in the above graph, came from only three different countries (i.e. France, Norway and Australia). The same trend is observed for general visitors to New Brunswick. Indeed, only three per cent of tourists to the province in 2005 were foreign travelers (excluding visitors from the U.S.) (New Brunswick Department of Tourism and Parks, 2006b). These findings suggest a deficiency in the international tourism market of the New Brunswick tourism industry. This also suggests that the whale-watching industry in the lower Bay of Fundy region does not have a high international profile, particularly in comparison to whale-based tourism areas in other parts of the country, such as the Pacific Coast, and the world (e.g. Australia). Indeed, Malcolm (2005) reported that whale watchers in Telegraph Cove,

Tofino and Victoria, B.C. were represented by 25 different countries. Nearly 80 percent of participants in dwarf minke whale tourism in the northern Great Barrier Reef, Australia indicated that they were foreign visitors to the country, with the majority of the passengers traveling from the U.S. (Birtles et al., 2002). In light of these findings, it is evident that international travelers are certainly a potential market of growth for the lower Bay of Fundy whale-watching industry and New Brunswick as a whole.

Group structure

The largest percentage of the customers (43.7 per cent) indicated that their tour group consisted of two adults with no children. In fact, most of the customers (68.2 per cent) had come on the tour without children (Figure 4.5). This suggests that whale watching may have a greater appeal for adult couples than families. However, these findings are also likely a reflection of the general tourist population in New Brunswick. Indeed, 64 per cent of travel parties to the province in 2005 traveled without children (New Brunswick Department of Tourism and Parks, 2006b).

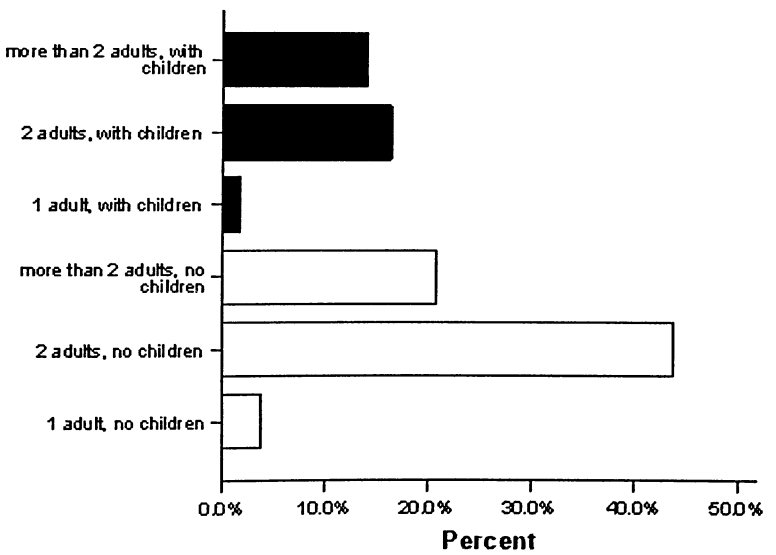

Figure 4.5 Structure of tour group as indicated by the whale-watching customers (N=245)

4.3.2 Whale-watching customers' previous whale-watching experience

The majority (64.5 per cent) of the customers had never engaged in recreational whale watching on their own (i.e. whale watching without going on a commercial marine tour), but nearly half (48.8 per cent) had previous commercial whale-watching experience (Table 4.4). In comparison to the findings reported in related studies, the proportion of customers with previous commercial whale-watching experience is much greater in this research. For example, Neil et al. (1995) found that 18 per cent of customers from tours on the southeast coast of Queensland, Australia indicated that they had previous whale-watching experience; in Warburton et al. (2001), 36.4 per cent of customers from tours in West Scotland reported that they had previously engaged in whale-watching activities; and Malcolm (2005) found that only 10.7 per cent, 3.7 per cent and 2.9 per cent of whale watchers in Telegraph Cove, Tofino and Victoria, B.C. respectively, had past commercial whale-watching experience. These results suggest that the whale-watching participants in St. Andrews and the Fundy Isles are particularly enthusiastic whale watchers. However, their previous whale-watching experience was not extensive (66.9 per cent of those with previous commercial experience indicated that they had been whale watching only one to three times).

Table 4.4 Comparison between whale-watching customers with previous commercial whale-watching experience and all customers

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Proportion of all the customers who have:

Previous commercial whale-watching experience (N=258).....48.8%

Previous commercial whale-watching experience specifically in the Bay of Fundy (N=258).....22.5%

Previous commercial whale-watching experience with their particular tour operator (N=246)	10.2%

Of those with previous commercial whale-watching experience, most (99.2 per cent) reported that they had boat-based experience. Atlantic Canada (44 per cent) and the North-eastern U.S. region (21.0 per cent) were the most common locations where the customers had previously engaged in commercial whale-watching activities. This is not surprising, given the particular travel origins of the customers.

Nearly a quarter of all the customers (22.5 per cent) had previous commercial whale-watching experience specifically in the Bay of Fundy. About a tenth of all the customers (10.2 per cent) indicated that they were repeat customers to their particular tour operator. Most of these customers (62.5 per cent) had been previously whale watching with their particular tour operator one to five times. Although a 10 per cent repeat customer rate may not seem significant, repeat customers are highly important to the tour companies; this sentiment was re-iterated by several of the operators during the interviews. Not only are repeated trips an indication of customer satisfaction, but they may also provide the tour businesses with a certain degree of "insulation" from potential fluctuations in tourist arrivals (Divisekera, 2003, p.47).

4.3.3 Whale-watching customers' views on the environment and the welfare of whales

Overall, the survey population exhibited a high level of support for increased governmental spending on environmental issues and a high level of concern for the welfare of whales in general and in the Bay of Fundy prior to the start of the tour (Table 4.5). Moreover, 27.3 per cent of the customers reported that they were members of organizations primarily concerned with the conservation of wildlife or the natural

environment, while 31.1 per cent of the customers indicated that they had given financial support (other than membership) to such organizations within the past year. These findings are not surprising, given that wildlife was the most important motivation in the customers' decision to go whale watching (Figure 4.6), and that related studies have also shown the supportive attitudes of whale-watching participants towards the environment and conservation issues (e.g. Warburton et al., 2001; Malcolm, 2005).

Table 4.5 Whale-watching customers' views on government spending on the environment and level of concern for the welfare of whales in general and in the Bay of Fundy

Government spending on the conservation of wildlife and the natural environment (N=253)	
Governments should spend less	0.8%
Governments should spend about the same as they do now	14.6%
Governments should spend more	84.6%
Level of concern for the welfare of whales prior to the start of the tour	
Expressed concern about the welfare of whales in general (N= 251)	87.3%
Expressed concern about the welfare of whales specifically in the Bay of Fundy (N= 255)	45.5%

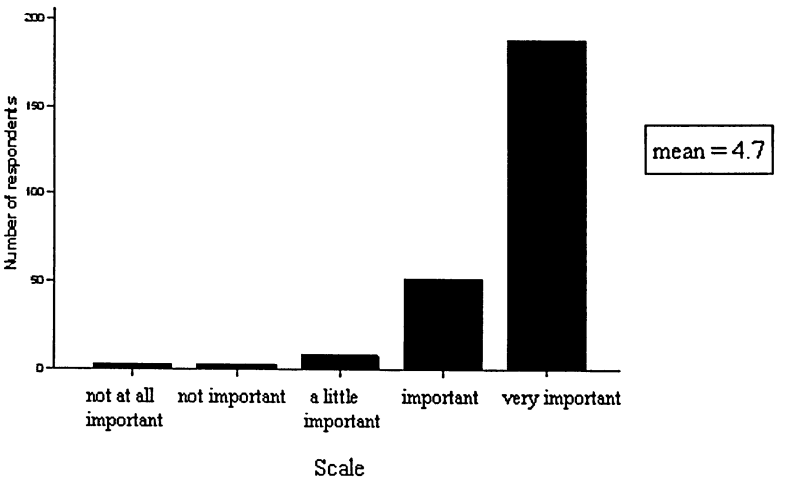


Figure 4.6 Distribution of the whale-watching customers regarding the importance of wildlife to their decision to go whale watching (N=256)

4.3.4 Whale-watching customers' awareness of the whales in the lower Bay of Fundy

Nearly 40 per cent (38.5 per cent) of the customers correctly chose the locally occurring whale species from a list containing both correct and incorrect response choices. The minke (30.6 per cent of the total responses), humpback (28.0 per cent) and finback (26.9 per cent) whales were the most commonly chosen whale species and these are indeed among the most frequently sighted species in the coastal waters of the lower Bay of Fundy. Since this information was requested before the tour, the customers' knowledge of the local whale species was not an influence of the tour itself. Their knowledge of the local wildlife may have been acquired during a previous whale-watching trip, from advertising, from the tour operator on booking, or from their own general knowledge of the region.

The customers' level of knowledge about the cetacean species in the local region is fairly consistent with the results published in other studies. For example, Warburton et al. (2001) reported that 33 per cent of whale watchers in West Scotland could correctly

name three local whale species. The researchers also found that the level of accuracy displayed by the customers was higher than the level demonstrated by general tourists in the region and even local residents. This suggests that whale watchers, not surprisingly, know more about whales than the general public.

4.3.5 Awareness of the DFO Whale-watching Guidelines and the Bay of Fundy Whale Watchers Code of Ethics

The proportion of customers who were aware of the DFO Whale-watching Guidelines and the Bay of Fundy Whale Watchers Code of Ethics were comparable (Table 4.6), although it was surprising that more customers indicated an awareness of the DFO guidelines. It was expected that the Code of Ethics would elicit a higher level of awareness given that it is the local management program, and from first-hand observations by the researcher, which were later corroborated by the operators themselves (see Chapter 5), the tour companies advertise their adherence to the Code of Ethics more than the DFO guidelines. One explanation for the greater awareness of the DFO guidelines is that some of the customers may have confused the two management programs, especially since questions on the DFO guidelines appeared first on the survey. Indeed, one customer admitted to mixing up the management programs by leaving a written note explaining his mistake on the questionnaire itself. The discrepancy between the customers' awareness of the DFO guidelines and the Code of Ethics, however, is small (i.e. less than 5 per cent difference) and is likely not indicative of a greater trend in the survey population.

For both the DFO guidelines and the Code of Ethics, the customers were most commonly aware of the guidelines concerning vessel approach/viewing distance

(although most did not provide specific distances) and that certain vessel conduct (e.g. crowding the whales) is prohibited. It is not surprising that viewing distance guidelines are well-known amongst the customers, given that such guidelines and regulations are commonly used methods of managing vessel-whale interactions (Baird and Burkhart, 2000; Carlson, 2007).

Table 4.6 Whale-watching customers' awareness of voluntary management programs

Proportion of customers who indicated an awareness of the voluntary management programs	
Bay of Fundy Whale Watchers Code of Ethics (N=255)	33.7%
DFO Whale-watching Guidelines (N=257)	37.0%
Source of awareness of Code of Ethics (number of customers)	
Tour company	37
Miscellaneous (e.g. campsite, ferry dock, word of mouth, media, signs)	13
Own research or general knowledge/ school or work-related source	12
Previous tour/another whale-watching trip	6
Tourism information/booklet/centre/tour guide	5
Source of awareness of DFO guidelines (number of customers)	
Tour company	25
Miscellaneous (e.g. word of mouth, signs, media, ferry ride)	21
Own research or general knowledge/ school or work-related source	15
Tourism information/booklet/centre	6
Previous tour/another whale-watching trip	5
The DFO itself (e.g. website)	4

The tour company was the most common source from which customers became aware of both the DFO guidelines and the Code of Ethics. This suggests that the tour companies advertise or promote the management programs to their customers (perhaps to

highlight the responsibility of the industry). These findings also indicate that the tour companies are more effective in raising public awareness about management practices than the DFO itself.

4.3.6 The extent of customer awareness of whale-watching management

Raising public awareness on whale-watching management programs and whale conservation issues has been recommended by a number of researchers as an important component of a sustainable whale-watching industry (e.g. Baird and Burkhart, 2000; Lien, 2001; Berrow, 2001; Malcolm et al., 2002). This is particularly advocated by Orams (1996), who argues that environmental education and interpretation programs can be useful tools in the managing nature-based tourism activities. Such arguments are fundamentally based on the premise that "a public that loves whales, and understands what their personal impact can be on the animals is, or could be, the best protection for the animals and best insurance that whale watching is sustainable" (Lien, 2001, p.14). According to this body of research, the greater the public awareness of management practices and conservation issues, the less likely the public is to engage in poor conduct during recreational whale watching and the more appropriate the public participation in the management of whale watching itself, particularly in assessing and reporting poor whale-watching vessel conduct and in lobbying governments for increased protection of cetaceans. As Berrow (2001, p. 5) concludes: "...education should be an integral part of developing sustainable whale watching... Information on the legislation and codes of conduct etc should be promoted at all opportunities together with the sensitivity and conservation value of the site." In support of this recommendation are the findings reported by Lück (2003), who studied tourist perceptions of interpretation programs

during "swim with dolphin" tours in New Zealand. The researcher found that the vast majority of the tourists surveyed (91.5 per cent) either strongly agreed or mildly agreed that they enjoyed learning about wildlife during their holidays. Another 95.5 per cent either strongly agreed or mildly agreed that it was important to learn as much as they can about wildlife. These findings support the implementation of educational interpretation programs during marine mammal tours, and, more importantly, the results suggest that the tourists want to be educated during the tours (Lück, 2003).

In assessing the extent of the customers' knowledge of the Code of Ethics and the DFO guidelines, it is apparent that the level of public awareness about whale-watching management is, for the most part, rather superficial. Indeed, only 35.8 per cent of those who were aware of the DFO guidelines (or 13.2 per cent of all the customers) indicated that they knew at least one provision under the guidelines, while only 23.3% of those who were aware of the Code of Ethics (7.7 per cent of all customers) indicated that they knew any provisions under the Code. This suggests that there is a need to raise the level of awareness *and* knowledge about whale-watching activities in the region to provide the public with a deeper understanding of management practices. To accomplish this, a public education outreach coordinated by the DFO and the tour operators may be necessary as recommended by Lien (2001). Indeed, data presented in Table 4.6 indicates that the DFO itself and the information included in tourism brochures can be more useful in informing the customers about management practices.

4.4 Chapter conclusion

The profiles presented above have created an overall picture of the tour operators and whale-watching participants in the commercial whale-watching industry in St.

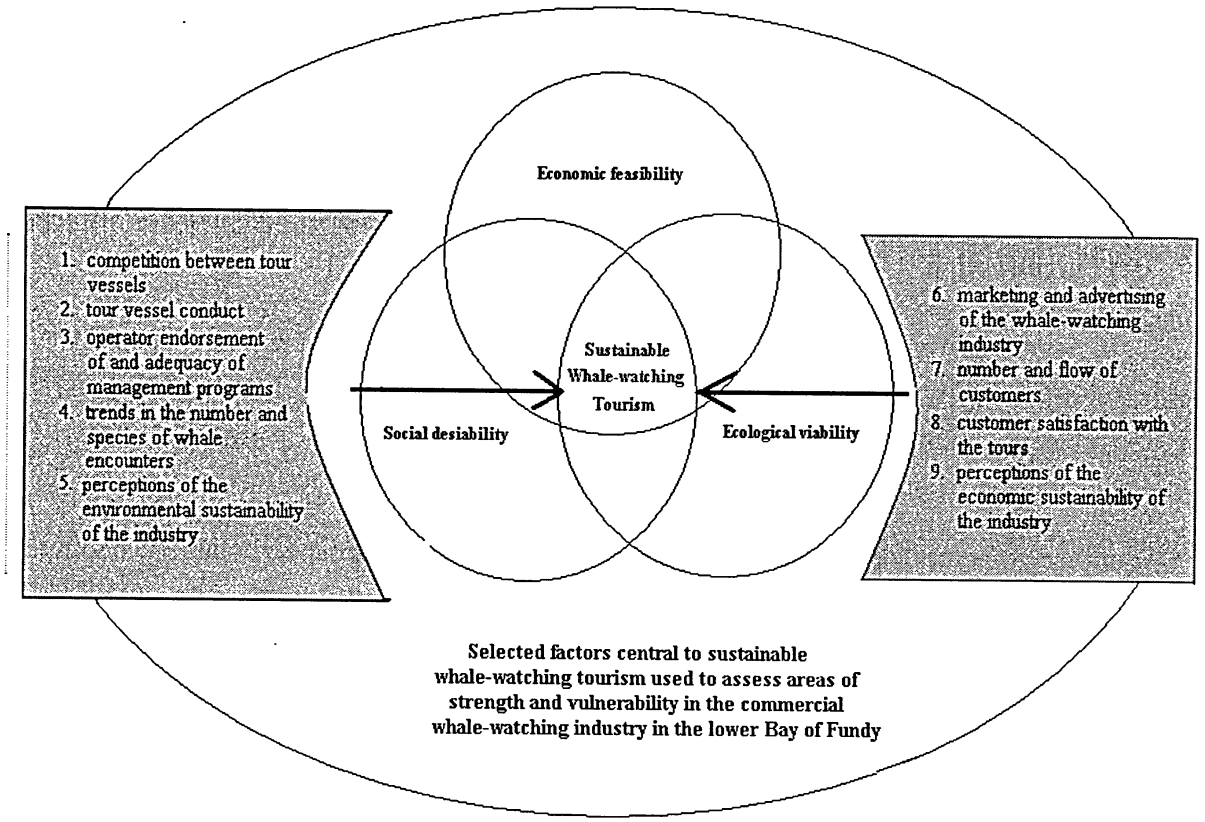
Andrews and the Fundy Isles. In the following chapter, the sustainable whale-watching tourism model introduced in Chapter two will be applied to the commercial whale-watching industry in the region to assess its sustainability.

CHAPTER FIVE

APPLYING THE SUSTAINABLE WHALE-WATCHING TOURISM MODEL TO THE COMMERICAL WHALE-WATCHING INDUSTRY IN THE LOWER BAY OF FUNDY, NEW BRUNSWICK REGION

5.1 Introduction

The following chapter presents results from the in-depth tour operator interviews and the whale-watching customer questionnaires according to the sustainable whale-watching model introduced in Chapter two. Drawing upon previous related studies, a number of factors were identified as central aspects of the commercial whale-watching industry and were incorporated into the sustainable whale-watching model in Chapter two. In this present chapter, these factors are used to assess the sustainability of the whale-watching industry in the lower Bay of Fundy New Brunswick region (i.e. St. Andrews and the Fundy Isles). Findings pertaining to each factor listed in the model are presented and discussed sequentially. The implications of the data with respect to the management, environmental and economic sustainability of the tour businesses are discussed and analysed through comparisons to the literature. Based on the data presented here, the overall strength and vulnerability of the region's whale-watching industry will be discussed in Chapter six. The sustainability model is re-introduced below to facilitate the presentation and discussion of the data.



Sustainable whale-watching tourism, listing the factors used to assess the sustainability of the whale-watching industry (from Chapter two)

5.2 Competition between the tour vessels

5.2.1 Number of competitors

The tour operators were asked to describe trends in the number of competitors in the region over the years. According to operators from two of the oldest businesses, the overall number of whale-watching companies in St. Andrews and the Fundy Isles has grown over the past decade. This observation corresponds with the timeline of when the operators became involved in the commercial whale-watching industry. This timeline is represented by Figure 5.1 and shows an overall increase in the number of whale-watching companies in the region from 1995 to 2005.

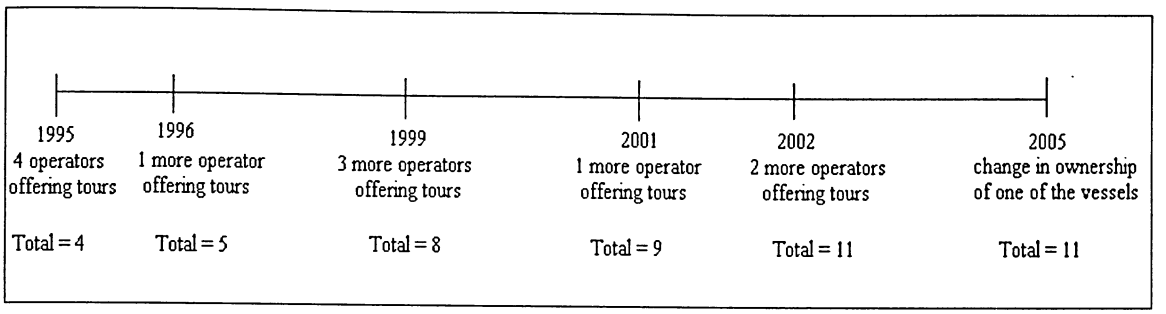


Figure 5.1 Timeline of when the tour operators interviewed in this study began their own commercial whale-watching tour business in St. Andrews or the Fundy Isles

Responses from the tour operators also indicated that there have been location-based differences in the development of the whale-watching industry during the past decade. According to the majority of the operators in St. Andrews, Deer Island and Campobello Island (N= 7), though there have been fluctuations over the decade, the overall number of tour companies in these particular areas has, for the most part, levelled off or remained the same in recent years.

According to the operators on Grand Manan Island, however, there has been a notable decline in the number of tour businesses on the island in recent years. There were six tour operators on Grand Manan at one point but there remain only two today. These observations are corroborated by Laurie Murison, a researcher with the Grand Manan Whale and Seabird Research Station, who noted that four of the six operators on the island retired in the early 2000s for a variety of reasons (e.g. health problems, job relocation, the impact of the whale-watching tours on the amount of time they had to enjoy their summer) (L. Murison, personal communication, August 24, 2007).

5.2.2 The nature of competition between the tour vessels

The tour operators were asked to describe the nature of the competition, if any, between the commercial whale-watching vessels in the region. Most of the operators (N=

8) felt that the whale-watching industry had become more competitive over the years. According to most of these operators (N= 7), there has been an increased intensity in the on-ground competition for customers. Examples of such competition, as cited by the interviewees, included office personnel spreading "rumors" about other companies to the customers and operators offering incentives such as an ice cream stand at their offices and food during tours. The fact that the majority of the operators (N=7) offer additional incentives for passengers to take their tours is indicative of the extent of the on-ground competition for customers (Table 5.1).

Table 5.1 Additional incentives offered by the tour operators (N= 7; some operators provided more than one response)

1. Partial or full refund if whales are not seen or if the customer is not satisfied	5
2. Next trip free if whales are not seen or if customer is not satisfied	4
3. A children's pass to the local marine science centre	1

Recall that there is a disparity in the number of commercial whale-watching operators between the various locations included in this study (Table 3.1). St. Andrews, for example, had six operators at the time of data collection, more than the three islands combined. Also recall that Deer Island and Campobello Island are geographically closer to St. Andrews than Grand Manan Island, which is more isolated from the other three locations (Figure 3.1). This means that there is a greater concentration of whale-watching operators in St. Andrews, Deer Island and Campobello Island. Interestingly, the comments about the increasing competitiveness of the industry were only expressed by

operators in the locations with higher numbers or a greater concentration of whale-watching vessels. According to one such operator: "There's 8, 10 or 12 or us here, of course there's gonna be issues." Moreover, both operators on Grand Manan Island referred to the reduction in the number of competitors on the island in describing trends in the nature of the competition between the tour vessels. In fact, one of the operators indicated that the decline has lessened the competitive nature of the whale-watching industry on the island. According to this operator, "I probably feel like I have less competition than I've ever had."

The implication of these findings is that the nature of the competition between the whale-watching businesses is related to the extent of marine tourism activity in the particular location, where an increase in the number of operators is associated with a greater intensity in the on-ground competition for customers. Indeed, comments made by the operators suggested that the level of competition is accentuated in St. Andrews, which has the highest number of whale-watching vessels. As noted by one operator:

> [The industry] has probably become more competitive for the customers in general, to get 'em to their door. I'm just speaking [about] St. Andrews. In St. Andrews ...one sells ice cream, the other one starts selling ice cream.

The apparent on-ground competition between the tour companies in St. Andrews is likely exacerbated by the fact that the businesses are concentrated in one particular area of the town (i.e. the Market Wharf), unlike the businesses on the islands, which are more geographically separate from one another (Figure 5.2).

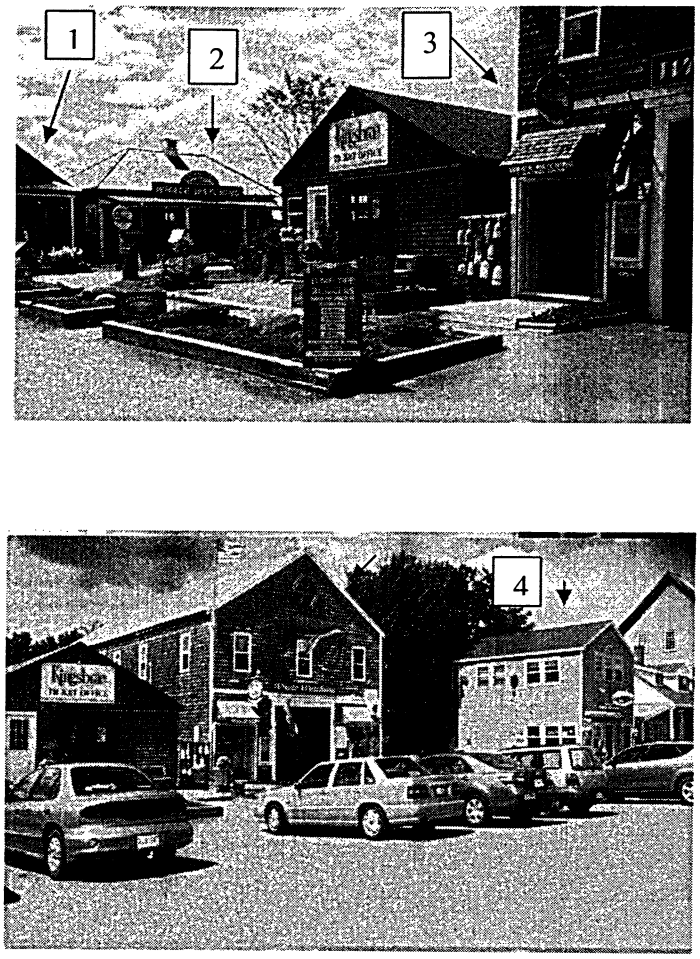


Figure 5.2 The Market Wharf in St. Andrews, showing the offices of four of the whale-watching businesses; the fifth office at the Market Wharf (not shown) is located directly across the two businesses in the bottom photograph *(photos taken by E. Bamfo, August, 2006, with the permission of the business owners)*

Although the level of on-ground competition for customers may be increasing, the data suggest that competition between the businesses is not manifested during the tours. Indeed, comments made by several of the operators about the sharing of information on whale locations exemplify the cooperation between the operators during viewing. For example, according to one interviewee:

> It's real competitive on land, like trying to get the tourists but out on the water, everyone does work good together... I know a lot of times, I'll wait, might wait 15 minutes longer than what I should. I'll make myself late for

> another boat to get there and pass the whale off but you know, the next trip someone might do that for you.

These comments were re-iterated by another operator:

> Once everyone is on the water, it's fairly cooperative among the majority of operators...sharing information and when we should distribute ourselves between whales at times...But the majority of the competition is still trying to get people on your boat first.

A similar level of cooperation was found between tour operators and researchers in the northern part of the Johnstone Strait on the coast of B.C. (Lawrence et al., 1999). Lawrence et al. (1999) found that the practice of sharing information on whale locations between whale watchers and researchers fostered further collaborative efforts between the two parties. This led to the establishment of a set of whale-watching management guidelines. According to the researchers, the opposite situation existed in the southern Johnstone Strait region, where whale watchers competed for information on the location of whales, leading to a deepened rift in the community and hindering future cooperation.

The findings in this present study suggest that the level of cooperation between the operators during viewing encourages adherence to management practices, particularly guidelines in the Bay of Fundy Whale Watchers Code of Ethics (the local management program) stipulating that no more than two tour vessels should view a whale or group of whales within 100m of the animal(s). Comments made by one of the operators underscore this point:

> Every whale-watching vessel that is out there, and we know them all, we're all helpful with each other...myself and most of the other boats, I don't like to go in and watch one whale when there's more than three or four boats so what I'll do at that time is, I know that the boat out of Blacks Harbour, the boat out of Campobello, have been there for ten minutes and I'll go and look at the seals for the time being. And they'll call me on the radio and say: 'We've been here for our 20 minutes; come on right in. We're gonna head

> out of here; come on in, you can take our spot.' And every whale-watching boat is like that. Very cooperative. And also, by doing that, it's helping the marine wildlife as far as I'm concerned.

Such a level of teamwork, as highlighted by the above comments, suggests that there is mutual respect and understanding between the tour operators. Indeed, as noted by Lawrence et al. (1999, p. 497):

> the potential for collaboration [between whale watchers] lies not in trust or the existence of a shared problem but rather in the ability of participants to negotiate a set of shared understandings of issues, interests, and identities that provide a sufficient framework for concerted understanding and action.

Whether the comments about taking turns to view whales are actually practiced during the tours was not specifically investigated and therefore cannot be confirmed with real observations of vessel conduct. Nonetheless, the available data suggest that the operators actively work together to minimize the impacts of whale-watching activities on the target species. This ultimately bodes well for the welfare of the whales in the waters of the lower Bay of Fundy, New Brunswick. Moreover, given the indication that cooperation between the tour operators themselves promotes compliance with whale-watching guidelines, it would be prudent for management officials (e.g. the DFO) to promote operator solidarity as a part of the management planning for the industry. In the same light, developing a collaborative relationship between operators and management authorities may also help to foster operator compliance with regulatory measures. This is particularly important at this point in time given the intentions of the DFO to implement marine wildlife viewing regulations, as discussed in Chapter two.

Despite the general consensus that competition was limited to on-ground competition for customers, there was one operator, however, who felt that competition

existed both on-land and during viewing. According to this interviewee, one particular operator in the region exhibited "aggressive" tendencies during viewing in wanting to get his customers "as close to the whales as possible," while on-land competition included office personnel speaking poorly about other companies to the customers:

> [It's] competitive in the way of viewing absolutely on the water. There are issues on the water...about some foreign operator that does get very aggressive. I think there are issues on the land, on shore there, around offices about things that are told that are not true because we hear it all the time. People come in and say: 'Oh, over there they said that you guys don't see whales or whatever.'

The suggestion of vessel competition during viewing raises questions about the potential impacts of whale-watching activities on the target species in the region, particularly in areas with a greater concentration of tour vessels (e.g. St. Andrews), where, consequently, more competition conflicts may arise. Indeed, comments made by one of the operators regarding the possible effects of high vessel traffic on the whales suggest that the number of whale-watching vessels in a given area is an important management issue. According to this operator:

> I guess at one point I wondered if we were getting too many boats. One time, I remember one time we were out there in the late afternoon and there was like 11 boats, 25 whales...but I mean that's two to a boat but still that much sound in the water must be confusion to some degree. So, in places where there are a lot of boats, I would think, you know, it's an issue.

In light of these comments and evidence from the literature indicating that competition between whale-watching vessels to get close to or pursue whales during viewing can be a source of repeated disturbances (e.g. Forestell and Kaufman, 1994 as cited by Lien, 2001), it is most likely beneficial, from an ecological conservation point of view, that the number of competitors on Grand Manan Island has declined, as noted

earlier. This reduction may be particularly beneficial for the North Atlantic right whales (one of the focal species for the Grand Manan operators) given their listing as an endangered species (Department of Justice Canada, 2007b).

5.2.3 Tour operator evaluations of how well the competition is doing in terms of customer flow

When asked about how well they felt their competition was doing in terms of customer flow, the responses provided by the operators again differed depending on the location of the operator. The operators on two of the islands and most of the operators in St. Andrews (N= 5) perceived that the local and regional competition was generally faring well in terms of the amount of business they attract. These operators felt that the competition was doing "well;" "okay;" "alright;" "pretty good"; or "fairly busy." Although these assessments cannot be substituted for concrete numbers on the direct revenues generated by whale-watching activities, the operators' comments nonetheless provide an indication of the economic health of the individual businesses in these particular areas.

With respect to one of the islands, however, the assessment of how much business the local competition attracted was not as positive. One of the operators on this island felt that while his regional competitors were doing well, his direct, local competition on the island were not having a successful season. This operator specifically noted that the local competition had run a relatively small number of tours thus far in the season.

5.2.4 Economic effects of local and regional competition between the tour vessels

When asked about the effects of competition on the success of their particular business, the responses were varied (Table 5.2). Six of the operators stated that they try to

ignore the competition, could not provide a specific answer to the question, or had not noted any positive or negative effects due to competition. The remaining five operators had varying opinions on the effects of competition.

Table 5.2 Tour operator views on the effects of local and regional competition on their particular business (N=11)

1. No positive of negative effects noted from the other whale-watching vessels in the region and local area.....2
2. Competition has a positive effect (e.g. through increased advertising for the region as a whole or by forcing one to offer a "better product").....3
3. Competition has a negative effect by affecting the success of my tour business.....1
4. Competition has both positive and negative effects.....1
5. Ignores the competition/cannot provide an answer.....4

Given the mixed reviews about the effects of competition on the success of the individual businesses, it appears that the increasing on-ground competition, as noted by the majority of the operators, may have both positive and negative impacts on the sustainability of the whale-watching industry in the lower Bay of Fundy. On one hand, having a number of operators all advertising whale-watching opportunities in one particular area may boost the profile of the region as a whale-watch area and may encourage the individual operators to enhance their tours (e.g. by adding incentives such as food during tours). This ultimately benefits the customers.

On the other hand, there was a strong indication that any positive effects of the on-ground competition for customers are not evenly distributed between the operators. This was touched upon by one of the operators who noted that:

> A few companies are doing better and some of the other ones are starting to fall behind a little bit just because of the competitive nature... I think that [competition] has been fuel to move ahead or to stay in place and some will fall off.

This operator's comments are well-demonstrated by the whale-watching businesses on one of the Fundy Isles in particular. The discrepancy in several of the responses provided by the operators on this island provides a fitting illustration of the uneven effects of on-ground competition for customers. For example, when the operators were asked to describe trends in the flow of customers to their businesses over the years, one of the operators on this island noted that the number of customers on his tours is "starting to get back up" after the terrorist attacks on September 11, 2001 in the U.S. led to a decline in tourist visitation. In regards to customer flow, this operator responded: "Last year [2005] got better; this year's [2006] getting better again." On the other hand, another operator on this island stated that the flow of customers on his tours has "definitely been down" in recent years, adding that he has experienced a 70 per cent loss in business between the 2005 and 2006 seasons.

The operators on this island noted the negative effect of the September 11 attacks on tourist flow to their businesses, particularly on travelers from the U.S. Consistent with the operators' comments are a number of studies which have documented the economic impacts of the events of September 11 on the travel and tourism industry, noting significant declines in U.S. visitation to domestic and international tourist destinations,

hotel occupancy rates, and tourism expenditure (e.g. Carden, 2005; Eisinger, 2004; Wilton, 2004; Goodrich, 2002).

In Canada, the terrorist attacks on September 11 certainly had a dampening effect on total tourism expenditure, as shown in Figure 5.3. The economic effects of the terrorist attacks also appeared to be more pronounced and longer lasting in the tourism industry in particular than the overall impacts on the Canadian economy (Wilton, 2004) (Table 5.3).

However, there was a quick recovery in the tourism industry after the terrorist attacks. This is evident in Figure 5.3, which shows that tourism expenditure in Canada increased in each of the quarters in 2002. In fact, tourism expenditure in 2002 was one of the highest on record for the Province of New Brunswick, reaching $1.2 billion (New Brunswick Department of Tourism and Parks, 2003). The U.S. also provided the largest share of visitors outside the Maritimes region in 2002.

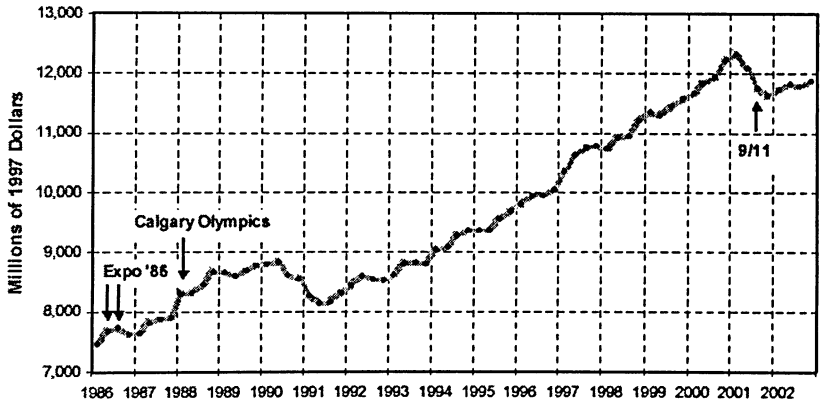


Figure 5.3 Total tourism expenditure in Canada by millions of 1997 dollars 1986 -2002, indicating the effects of the terrorist attacks of September 11, 2001 *(from Wilton, 2004, p. 16)*

Table 5.3 Quarterly growth rates in Canada's GDP and tourism expenditure in 2001 (modified from Wilton, 2004, p.18)

Quarter	Growth rate in Canada's GDP	Growth rate in tourism expenditure
I	0.3	0.9
II	0.3	-1.9
III *	-0.2	-2.6
IV	0.9	-1.3

* the quarter in which the September 11 attacks occurred

The recovery after the terrorist attacks is evident in the comments made by one of the operators on the islands. However, this suggestion was not consistent for all the operators; in fact for an operator on the same island, there was only an indication of a continued loss in customer flow. This suggests that the loss of business for this particular operator is more greatly associated with the effects of competition than a decline in tourist visitation due to the September 11 attacks. This raises serious questions as to whether this operator can survive as a provider of whale-watching tours. Indeed, the cumulative implication of the results is that the present number of operators on the island may not be economically sustainable. A remark made by one of the operators reflects this implication from the data: "I think the last man standing in this business will have a good business some day."

The disparity between the operators on this island may be partly related to the number of years in which the operators have been involved in the whale-watching business. In fact, the sentiment that the number of years in operation has an impact on the customer flow to the businesses was prevalent amongst the tour operators. For example,

an operator from one of the youngest businesses felt that his competitors in the region were doing better than he was in terms of customer flow because they were "well established" and had been in the business for a longer period of time. Indeed, many of the operators emphasized that experience in the industry was key, stating that those who had been in the industry for a long time were doing or will do well. According to one operator:

> I think the ones that have been in [the business] for a while will be in it for a long time or as long as they want. And I think the ones that are just getting in...just the last couple years, [will find the] competition is pretty tough... [they'll] have a hard job breaking through.

These findings suggest that with regards to on-ground competition for customers, the longer running whale-watching businesses may have a competitive advantage. This is substantiated by the fact that of the 11 operators in the region at the time of data collection, only the seven longest-running tour operations (i.e. in operation for 8 seasons or more) are currently advertised on New Brunswick's tourism website (New Brunswick Department of Tourism and Parks, 2007b). These companies therefore satisfy market readiness/product development guidelines stipulated by the province's tourism agency (D. Rioux, personal communication, July 30, 2007). Those companies that do not meet the criteria are not advertised on the provincial website, all of which are the younger tour companies (i.e. in operation for 6 seasons or less). This certainly appears to put the younger tour businesses, who perhaps have not yet built up their customer base and reputation in the region, at a competitive disadvantage. In this regard, the increased intensity of the on-ground competition for customers may threaten the economic sustainability of these businesses.

5.3 Tour vessel conduct

5.3.1 The evaluation of tour vessel conduct according to the tour operators and customers

The tour operators were asked about the conduct of the commercial whale-watching vessels in the region in terms of their interaction with the wildlife. In response to this question, most of the operators (N= 9) gave generally favourable reviews of vessel conduct, with several remarks about the cooperative relationship between the tour operators in the region, such as: "As a general, I think everyone works good together and for as many boats as there are we make it work pretty good;" "I think the majority [of tour operators] are quite good;" "Where we are, everybody's good because there's only two or three boats. We're very respectful of each other; we share information." These remarks are consistent with comments described earlier about the lack of competition between the tour vessels during viewing.

The whale-watching customers were also asked to evaluate tour vessel conduct and operator management of the tour. Their assessment corresponds fairly well with the operators' responses noted above. Like the operators, the customers generally highly rated the conduct of the whale-watching tours. This is most evident in the rating of how well the tour was managed, where 72.2 per cent of the customers felt that their tour was "very well managed" by the operator in terms of the welfare of the wildlife being viewed (Figure 5.4).

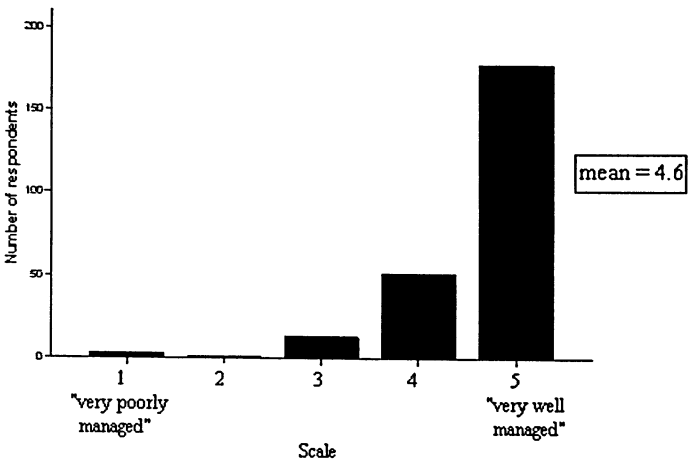


Figure 5.4 Distribution of the whale-watching customers regarding how well the tour was managed by the operator in terms of the welfare of the wildlife (N=248)

The favourable assessment of tour vessel conduct by the majority of the operators and the whale-watching customers is consistent with the evaluation made by the DFO's Marine Mammal Advisor for the Maritimes Region, Mr. Jerry Conway, who also had generally positive and supportive views regarding the conduct of the commercial tour vessels in the region (J. Conway, personal communication, April 20, 2007). According to Mr. Conway, the vast majority of tour operators in the region are "responsible", while just five per cent of the operators put the customers' satisfaction and making money ahead of the welfare of the wildlife. These rather positive evaluations and the indication that there is a lack of competition during tours suggest that the operators in the region are, for the most part, fairly responsible in terms of their interaction with the wildlife.

However, the results also suggest that there is still a need for improved management of tour vessel conduct in the lower Bay of Fundy region. For example, nearly half of the tour operators (N= 5) expressed some concerns about vessel conduct in the region. These concerns ranged from operator adherence to the Code of Ethics to the

behaviour of specific whale-watching vessels in the region (Table 5.4). A number of the tour operators (N=5) also indicated that they have or have had concerns about the number of commercial whale-watching vessels in the region, particularly in relation to the number of whales and the size of the whale-watching area.

Table 5.4 Concerns raised by the tour operators in relation to poor whale-watching vessel conduct (N=5)

1.	Certain vessels quickly viewing or going from whale to whale in order to stay within the time constraints of the tour	1
2.	Adherence to the Code of Ethics (i.e. the Code is violated when there are a number of vessels waiting to view a whale at the same time)	1
3.	Certain vessels being "aggressive" during viewing (e.g. in terms of proximity to whales)	1
4.	Certain vessels following/coming close to their vessels to find or get close to whales	2

Many of the operators (N= 6) also expressed concerns about recreational, private boaters and their interaction with the marine wildlife, often citing that recreational boaters were more problematic than commercial whale-watching vessels. One operator made the suggestion of expanding the Code of Ethics to pleasure boaters as well. These concerns are consistent with Lien's (2001) observation that the majority of the problems related to whale-watching vessel conduct in Canada occur with recreational boaters rather than commercial operators.

Nonetheless, adding further weight to the evidence that there is a some need to improve tour vessel conduct in the region are findings from the customer questionnaires

which show that nearly one out of every seven of the customers surveyed (13.9 per cent) reported that they witnessed vessel conduct during the tour that raised concerns about the welfare of the marine life being viewed (Table 5.5). These customers were mainly critical of the conduct of their particular whale-watching vessel. Generally, the types of vessel behaviour that raised the most concern for the customers are consistent with the types of complaints that are most commonly reported to the DFO (J. Conway, personal communication, April 20, 2007). These include: the proximity of vessels to wildlife, vessels chasing wildlife and vessels following wildlife. This suggests that these particular behaviours are the most pressing issues for the management of whale-watching activities in the region.

Table 5.5 Whale-watching customer evaluation of tour vessel conduct

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During the tour you just completed, did the conduct of the vessel your were on and/or other vessels in your vicinity raise any concerns at all about the welfare of the marine life being viewed? (N = 244)

Yes.....13.9%
No.....86.1%

Which vessel's conduct raised concerns about the welfare of the wildlife? (Percentage of those who answered affirmatively to the above question) (N = 30)

1. Conduct of the vessel I was on only.....53.3%
2. Conduct of other vessels in vicinity and the vessel I was on.....40.0%
3. Conduct of other vessels in vicinity only.....6.7%

Which type of vessel conduct raised concerns? (Top three responses) (N = 32)

1. Vessels too close to wildlife.....22.1 % (percentage of total responses)
2. Vessels chasing the wildlife.....15.4 %
3. Vessels following the wildlife.....15.4 %

5.3.2 The reliability of the whale-watching customers' evaluation of tour vessel conduct

Having nearly 14 per cent of the whale watchers indicate that they witnessed poor vessel conduct is certainly notable given the potential behavioural and biological impacts of whale-watching activities on the target species, as discussed in Chapter two. Indeed, at first glance, these findings do not bode well for the environmental sustainability of marine tourism activities in the region. However, the reliability of the customers' evaluation of vessel conduct can be questioned. First, only about one third of the customers were aware of the Code of Ethics and the DFO guidelines (33.7 and 37.0 per cent, respectively). Second, the majority of the customers (65.7 per cent) did not know whether their operator endorsed the Code of Ethics or not. Third, results reported by Baird and Burkhart (2000) show that the general public is generally poor at estimating distances between boats and whales and often show the tendency to underestimate distances. The researchers found that the mean level of variability between estimates of distances and actual distances between whales and vessels was 37 per cent (SD = 20 per cent; N= 73); they also reported that tour vessel captains were better at estimating distances on water and showed far less variability in their estimates than the general public. These findings suggest that the whale-watching public is not particularly knowledgeable about management programs in the region, and that they may not be as good at judging distances on water as the tour operators themselves. Consequently, customer concerns about vessel proximity to whales should be regarded with caution. It can also be argued that it is somewhat hypocritical of the whale-watching customers to judge vessel conduct because they are the reason why the tours are conducted in the first place (Malcolm, 2005).

Nonetheless, the concerns of the customers regarding vessels following/chasing whales and vessel proximity to whales should not be completely disregarded, particularly in light of the fact that none of the tour operators have specific tools or equipment on their boats to accurately measure the distance to whales during viewing. Indeed, all the operators indicated that they use visual or auditory means of estimating the distance between their vessels and the whales, with a few of the operators (N=3) stating that the distance estimation is based on experience or educated guessing (e.g. by comparing the distance between the vessel and the whale to a familiar/well-known distance).

Moreover, findings reported by Williams et al. (2002) also suggest that customer concerns about vessel proximity to the wildlife should not be taken lightly. The researchers investigated the relationship between boat traffic and the behaviour of northern resident orcas (*Orcinus orca)* in the Johnstone Strait, B.C. At the time of data collection in 1995 and 1996, there were three main whale-watching operators and a total of four tour boats in the region. Similar to the tour operators in the lower Bay of Fundy, New Brunswick, operators in the Johnstone Strait area have a voluntary code of conduct stipulating that they remain at least 100m away from the whales during viewing (Williams et al., 2002). Williams et al. (2002) sought to investigate whether a vessel that was actually following this guideline would affect the behaviour of the whales. The researchers repeatedly recorded the behaviour (i.e. swim speed, dive times and surface-active behaviour such as breaching and spy-hopping) of 25 individual whales from the population when there were no boats around and in the presence of a 5.2 m motorboat that made parallel approaches to the whales up to 100m. Their findings indicate that the 100m approaches to the whales elicited avoidance behaviour in the animals. The swim

paths of both male and female whales became less predictable during vessel approaches than in the absence of the boat; with male whales tending to adopt "smoother but non-directional" swim paths and female whales showing more "erratic" paths, changing the angle of their dives with each successive dive (Williams et al., 2002, p. 226). Williams et al. (2002) reported that female whales also increased their swim speeds and their dives tended to be shorter as the boat approached them. Although the authors expressed uncertainty as to whether their results could be extrapolated to whale populations in other regions, their results demonstrate that even those vessels which follow management guidelines can elicit behavioural responses from the target animals. This underscores the importance of basing management guidelines on actual biological observations of whales and their responses to vessels (Williams et al., 2002). The results reported by Williams et al. (2002) and the customers' concerns about vessel proximity to whales in this present study suggest that viewing distance standards for whale-watching vessels are in need of further scientific research and should be a key management issue for the upcoming amendments to the *MMR*.

5.4 Tour operator endorsement of and perspectives regarding the adequacy of current management programs

5.4.1 Endorsement for the Code of Ethics

There was a high level of operator awareness of and endorsement for the Code of Ethics. All the operators indicated that they were aware of the Code. Moreover, the majority (N=9) of the operators endorsed it and stated that they advertise their endorsement of the Code to their customers. This level of support for the Code is encouraging for the management of whale-watching activities in the region, particularly

since other researchers have reported much lower levels of endorsement for local management programs in other whale-watch areas (e.g. Parsons and Woods-Ballard, 2003; Corbelli, 2006 as cited by Scarpaci et al., 2007). For instance, Corbelli (2006, as cited by Scarpaci et al., 2007) found that less than 40 per cent of whale-watching operators in Newfoundland signed onto their local code of conduct, when it was introduced in 2001.

5.4.2 Endorsement for the DFO Whale-watching Guidelines

The results indicate that the DFO Whale-watching Guidelines are not as well known to the tour operators as the local Code of Ethics. Indeed, four of the operators were not aware that the DFO had whale-watching guidelines and one operator had heard of the DFO guidelines but had never read them. Three of the operators also felt that the guidelines were unnecessary given that there already is a Code of Ethics in place to manage whale-watching activities in the region. These findings support the need for a single, comprehensive set of management standards.

The differences found between the Code of Ethics and the DFO guidelines with respect to the operators' level of awareness of and endorsement for the management programs are consistent with findings reported by Parsons and Woods-Ballard (2003). Similar to this study, Parsons and Woods-Ballard (2003) found that tour operators in Scotland accepted and endorsed a set of whale-watching codes of conduct that had been produced by their own operators' association (e.g. the Scottish Marine Wildlife Operators Association) over national guidelines set by the government and guidelines published by NGOs (e.g. The International Fund for Animal Welfare Code). Indeed, only 27 per cent of the 30 tour operators surveyed were even aware that the UK government had whale-

watching guidelines and none of the operators used those guidelines during viewing. The implication of their results is that operators prefer locally-produced codes of conduct (Parsons and Woods-Ballard, 2003). The same conclusion can be drawn from the results in this present study. The findings from both studies suggest that operators should be active participants in the monitoring and management of whale-watching activities. This will likely encourage operator uptake and endorsement for management regulations.

5.4.3 The adequacy of current management programs in the region, particularly the Code of Ethics

Various questions on the interview guide (e.g. 6.e, 6.g., 6.i, and 6.m, Appendix B) were developed to probe the tour operators' opinions on the adequacy of the current voluntary management programs at addressing and managing whale-watching activities in the lower Bay of Fundy, New Brunswick region. On the whole, the operators' responses to these questions suggest that the Code of Ethics and the DFO guidelines are somewhat inadequate. This is most evident in the finding that the majority of the operators (N=7) believe that management improvements are necessary. The operators' recommendations for improving management are summarized below in Table 5.6. The majority of the improvements suggested by the operators were related to regulating the number of tour businesses in the region. As one operator put it:

> Anybody can be a commercial vessel.... Right now, I think everybody around here on any given day is pretty responsible and pretty careful. But, at any time, anybody can decide they wanna be a whale-watching boat with under 12 passenger rule as a self-inspecting vessel and then they are a commercial operator. So if everybody had to be licensed, there would be some recourse, some scrutiny, you know.

Table 5.6 Recommendations of the tour operators for improving whale-watching management (N= 7; one of the operators provided more than one response)

1. More research-based data on vessel-whale interactions	1
2. Licences to regulate/limit the number of operators and boats	3
3. Stronger and mandatory regulations	1
4. Better education amongst whale-watching marketers to market the industry responsibly	1
5. Extending Code of Ethics to pleasure boaters	1
6. Have a government observer on every boat	1

Comments made by several of the operators regarding poor operator compliance with the Code of Ethics added further weight to the indication that the present management regimes do not adequately manage whale-watching activities. One operator stated that the Code is violated almost everyday. According to another operator, "No one follows it [the Code of Ethics]. Everyone says that they're following it but straight up, no one follows it."

Comments made by two of the operators suggested one of the contributing factors to non-compliance with the Code of Ethics is the duration of the tours. The Code instructs that no more than two vessels should view the same whale or group of whales within 100m of the animal(s). If the Code is adhered to, then this means that operators have to wait their turn to view the wildlife when there are more than two vessels already viewing the whale(s). However, according to one operator, the whale-watching boats often do not have the time during a tour to wait on other vessels because there are time restrictions on how long they can spend on the water before returning back to pick up another load of

customers. According to this operator, there is pressure on the operators to locate and view whales within a restricted amount of time. He believed that over time, this pressure also "puts a strain on the whale population." These sentiments were shared by another operator, who made similar observations about the effects of trip time on the vessel-whale interaction:

> It's not uncommon for the whales to just go about their business around us. And we find that to be much more successful than what we call 'race and chase.' We do see whale-watch operators sometimes doing...that's our own little term the 'race and chase'...there's a whale, zip over to it; there's a whale, zip over to it; there's another one, zip over to it! The pressure is on to show the customers as many whales as they can and then get back and get another load within the two hours or whatever is allotted.

The observations expressed by the two operators are likely specific to the whale-watching businesses in St. Andrews, Deer Island and Campobello Island. The Grand Manan operators, on the other hand, may not experience as much pressure to locate and view whales within a specified time limit since they have the longest trip times (Table 5.7).

Table 5.7 The duration of the tours (hours) according to location
(the tour business on Deer Island was combined with the operators on Campobello Island to facilitate the comparison)

Location	Average duration of the whale-watching tours (hours)
Grand Manan Island (N=2)	4.5
Deer Island and Campobello Island (N=3)	2.5
St. Andrews (N=6)	2.75

It must be reiterated that the present study did not observe vessel conduct during the actual tours. The data presented here are based on the perceptions and attitudes of the

operators. Thus, the operators' comments about non-compliance with the Code cannot be confirmed with quantitative assessments of the whale-watching tours in the region. Here, however, related studies can be useful in providing findings against which the operators' comments can be compared.

Recall that nearly all of the operators (N=9) indicated that they endorse the Code of Ethics. However, in a recent study comparing tour operator compliance with distance and approach guidelines in Australia, Lalime (2005) found no correlation between the operators' attitudinal compliance and their actual compliance with whale-watching guidelines during viewing. The implication of these results for the present study is that just because the operators stated that they endorse the Code of Ethics, does not necessarily translate into actual adherence to the Code during whale watching. Indeed, comments made by several of the operators suggest that there is consistent non-compliance with the Code. These sentiments are not particularly surprising given that several researchers have documented moderate to low levels of operator compliance with voluntary codes of conduct in various parts of the world (e.g. Whitt and Read, 2006; Corbelli, 2006, as cited by Scarpaci et al., 2007). For instance, Whitt and Read (2006) investigated the degree of compliance with regional voluntary guidelines for five dolphin-watching companies in Clearwater, Florida. Guidelines for marine tourism activities in the region stipulate that the vessels should remain 50 yards (about 46 metres) from the dolphins. The researchers found that companies complied with this particular guideline on average 57 per cent of the time. Whitt and Read (2006) also found a lack of uniformity with regards to compliance. For example, one company violated the guidelines and approached closer than 50 yards on 61 per cent of their encounters with

the dolphins, while another company approached closer than 50 yards 22 per cent of the time.

In this study, there were several comments by a number of the operators (N= 5) at various points during the interviews which indicated that the presence of the Code of Ethics was good for marketing and allowed the tourists to recognize that the industry was responsible.

This was highlighted by the following operator statements:

> It's a good marketing tool as well, to have a Code of Ethics that say, you know, this is what we adhere to. It may set you apart from other people, if a person actually does abide by it.
>
> A lot of people signed [the Code of Ethics] but it's become more of a marketing tool.
>
> From a straight business point of view, from a marketing point of view, most people wanna know that they're going on a tour that is not gonna impact the environment, that will not impact the whales.
>
> I dunno if [the Code of Ethics] is necessary because it is sort of self-policing but it's good just to have it on paper I think. It's good for the tourists to be able to see that we are trying to do it responsibly. So it's good to have it on paper for people to see that we are trying, I guess.
>
> We endorsed [the Code of Ethics] at the time thinking that it was...well, pretty much everybody done it, I guess. So we just jumped on the band-wagon there. It was kind of an advertising thing when it first come out and the government was pushing it hard so they were telling tourists that make sure you were going on a boat that was a signee of the Code of Ethics.

These remarks, in addition to the comments described above about non-compliance with the Code of Ethics, created a strong impression that the Code served a greater function as a marketing tool rather than a management strategy. This is particularly reflected by the fact that a whale-watching operator must be a signatory of

the Code in order to be advertised in the official provincial travel guide and tourism website (D. Rioux, personal communication, August 15, 2007).

The findings presented here on the adequacy of the Code of Ethics, particularly the indication of operator non-compliance with the Code, seem to somewhat contradict the generally positive assessment of tour vessel conduct made by the operators, the whale-watching customers and the Marine Mammal Advisor for the Maritimes region, as discussed above. The conclusion that can be drawn from this contradiction in the findings is that although the tours are generally well managed in terms of their interaction with the wildlife, there are still problems with vessel conduct that are not adequately addressed or managed by the present management programs in the region. In this regard, the need to move away from voluntary guidelines and formally regulate the whale-watching industry via legislation is supported by the data.

One of the most important messages that should be drawn from the data is that there is a need to further investigate operator compliance with management regimes in the region, particularly to determine the factors which influence compliance (e.g. trip time) so that the necessary management adjustments can be made. This will ultimately enhance the sustainability of the whale-watching industry in the region.

5.4.4 Tour operator response to the upcoming amendments to the Marine Mammal Regulations (MMR)

As noted earlier, the DFO is in the process of amending the *MMR* to include non-consumptive activities such as wildlife viewing. The need to amend the *MMR* is based on the assessment of the current regulations as being "general" and lacking information on the appropriate conduct for viewing marine mammals in the wild (DFO, 2005, p.1). As

discussed in Chapter two, the specific provisions of the amendments are still ongoing but the DFO released a report in March 2005 with an abbreviated version of the current *MMR* with the proposed amendments incorporated (DFO, 2005).

The tour operators were asked about the upcoming amendments to ascertain their opinions on government regulation of the industry. Responses from the operators on this issue indicate that there is some need for improved consultations between the DFO and the operators in the region. Indeed, two of the operators were not aware that the DFO was even in the process of legislating whale watching and four operators were not aware that the DFO had whale-watching guidelines. As noted in Chapter two, consultations between DFO officials and marine tour operators (including the general public) have occurred in the Pacific Coast of Canada, with meetings in Tofino, Victoria, Vancouver, Sidney, and Port McNeil, B.C. (to name a few) from January to March, 2003 (DFO, 2003). According to the DFO, these meetings were conducted to "ask Canadians what kinds of protection are necessary for marine mammals" (DFO, 2005, p. 2). The proposed revisions to the *MMR* were drafted based on these meetings and discussions with First Nations representatives (DFO, 2005). These consultations were followed up by "Community Dialogue Sessions" in March and April 2005 in Victoria, Port McNeil and Vancouver, B.C. and meetings with commercial tourism operators in Tofino, Victoria and Campbell River, B.C. in April and May, 2005 to further discuss the proposed regulatory amendments to the *MMR* (DFO, 2007). These consultations and meetings suggest that the DFO recognizes the importance of involving the operators and the general public in the management of marine tourism activities. However, there is no indication that a similar level of consultation has occurred in the Maritimes region between the tour operators and

the DFO (J. Conway, personal communication, April 20, 2007). Indeed, according to the Marine Mammal Advisor for the region, the operators who are aware of the upcoming amendments to the *MMR* have been notified only on an individual, "one on one" basis by the local fisheries offices and not through a formal gathering (J. Conway, personal communication, April 20, 2007).

For the tour operators in St. Andrews and the Fundy Isles, the reception to the DFO's intentions to include whale watching as a regulated activity under the *MMR* can be described as lukewarm. On one hand, a number of the operators (N=5) agreed that there was a need for government regulation of whale watching through legislation. Most of these operators (N=4) were from St. Andrews, which has the greatest concentration of whale-watching operators in the lower Bay of Fundy region. Consequently, it was not surprising that the issue of licensing and limiting the number of whale-watching vessels was accepted by the operators as an appropriate management tool. In fact, whale-watching licences was the most commonly discussed topic with respect to the upcoming revisions to the *MMR*, although there is no definitive indication from the DFO at this present time that the regulatory amendments will require tour operators to obtain specific whale-watching licences nor that there would be limitations placed on the number of operators in a particular region (J. Conway, personal communication, April 20, 2007). However, a "Marine Mammal Watching Licence" with specific requirements for tour operators, along with a specified annual fee to be collected by the DFO, is being proposed in the draft revisions to the regulations (DFO, 2005, p.4). Such a licensing scheme would be similar to the whale-watching regulatory system in New Zealand, where tour operators must obtain permits from the Department of Conservation in order

to operate marine tours (Cloke and Perkins, 2005). These permits add a number of restrictions to whale-watching and "swim-with dolphins" operations, including: the daily number of tours, the times and duration of the tours, the cetacean species allowed to be viewed; the number of swimmers in the water at any given time, the speed of the vessels and the approach distance to the wildlife at different times of the year (e.g. in breeding season) (Cloke and Perkins, 2005).

Although some of the tour operators agreed that whale-watching regulations were necessary, there was a certain level of scepticism, particularly from two of the operators, regarding the sincerity of the government's intentions to legislate the marine wildlife viewing industry because of the time it has taken to actually implement the amendments. Several operators (N= 4) also expressed some scepticism about how effectively the amendments would be enforced, with two of the interviewees voicing concerns about how the potential licences would be distributed. This level of scepticism suggests that there is some degree of mistrust or doubt amongst the operators about the government's ability to regulate whale-watching activities. This adds further weight to the argument that the DFO should involve the operators during the *MMR* amendments process (e.g. through seeking consultations to elicit operator opinions and concerns). This would ease potential mistrust of the government and encourage compliance with the regulations once they come into effect. Although it appears that the DFO has began and maintained consultations with operators on the West Coast of Canada, the Maritimes region has not yet received the same level of attention.

Many of the tour operators interviewed in the lower Bay of Fundy region (N= 6) believed that regulating whale-watching activities via legislation will have or may have

some negative impacts on their business and/or other businesses in the region depending on the particular stipulations of the regulations, such as the restrictions placed on viewing and approach distances, and the restrictions placed on the daily number of tours and the number of tour vessels allowed in the area.

A minimum approach distance of 100m from cetaceans during wildlife viewing is currently being proposed for the *MMR* amendments (DFO, 2005). This is exactly the same distance standard currently set in the Code of Ethics and the DFO's Whale-watching guidelines. However, consistent with Lien (2001), who recommended that whale-watching regulations in Canada should be adaptive, the draft amendments to the *MMR* also allows for the different coastal regions in Canada to set specific regulations that "recognize regional differences in the kinds of activities of concern, the local geography and the species needs in different areas" (DFO, 2005, p. 5). This leaves room for species-specific distance guidelines, the implementation of which would have variable impacts on the tour businesses in the lower Bay of Fundy region due to the variability in the type and frequency of species sighted between the different locations. For example, given their status as an endangered species under the *SARA*, right whales may be ideal candidates for increased protection. If viewing right whales is restricted to the extent with which restrictions are applied in the U.S., where there is a 500m exclusion zone around these whales (Spalding and Blumenfeld, 1997; Lien, 2001), this would undoubtedly affect the quality of the whale-watching experience with this species. The tour operations on Grand Manan Island in particular would be more negatively affected because right whales are more commonly sighted by the Grand Manan operators and this species is a major attraction for the tour businesses on the island. This, however, is only

speculative. After all, the amendments to the *MMR* have not yet been consolidated. Consequently, at this present time, it is difficult to assess how the *MMR* revisions may impact the sustainability of whale-watching businesses in the lower Bay of Fundy region, until the specific provisions of the regulations are known and brought into effect.

5.5 Trends in the number and species of whale encounters

5.5.1 Frequency of whale encounters

The success of any wildlife viewing business is clearly based on the frequency of encounters with the focal species. On this particular issue, it appears that the whale-watching operators in the lower Bay of Fundy, New Brunswick region are highly successful. Indeed, several of the operators boasted about their whale encounter success rates and added that they rarely miss seeing a whale during the season. Three operators specifically stated that they see at least one whale species on about 96-98 per cent of their trips. These claims are backed by the fact that every whale-watching customer surveyed in the study reported that they encountered at least one whale during their tour. This indicates a 100 per cent sighting success rate from the 61 tour trips on which questionnaires were collected. Such a high encounter success rate is certainly a strong point of the whale-watching industry in the region.

5.5.2 Trends in the number and species of whales

The general consensus amongst the tour operators was that despite yearly, monthly, weekly, daily or even hourly fluctuations, overall, the number and species of whales encountered have generally remained the same throughout their years in operation. In spite of this, however, many of the operators (N= 6) indicated that they have been encountering fewer numbers of finback whales and that the finbacks appear to be

farther offshore over the past one or two seasons than in previous seasons. In fact one tour operator in particular described the 2006 season as one of the worst years for the number of finbacks in the area over the past decade. The most commonly suggested reason for the decline in finback numbers was the availability and location of food supply (e.g. herring). It should be noted that all the observations about the declines in finback whale encounters were made by operators in St. Andrews, Deer Island or Campobello Island. None of the Grand Manan operators noted any specific changes in their encounters with this particular species.

Unfortunately, no long-term studies on trends in the distribution and numbers of finback whales in the lower Bay of Fundy or Gulf of Maine could be found to compare the observations of declines in finback whale encounters, as cited by many of the operators. Indeed, "there is insufficient data to determine population trends for this species," according to a recent publication on the Western North Atlantic stock of finback whales released by the North-eastern Fisheries Science Centre (NEFSC, 2003a, p. 25).

Nonetheless, a recent study by Ingram et al. (2007) provides insights that add some credence to the tour operators' observations. Although the researchers did not specifically investigate temporal or spatial changes in the distribution or number of finbacks in the Bay of Fundy, their results showed that finback whale distributions in the region for the summer of 2002 were concentrated farther offshore, specifically from St. Andrews, than certain minke whale distributions. This is highlighted in Figure 5.5 below. Note that the finback whale distributions are concentrated near the northern end of Grand Manan Island. An interesting aspect of the Ingram et al. (2007) study is that the sightings of the whales were recorded on whale-watching trips from one of the St. Andrews tour

businesses featured in the present study. The implication of this is that whale-watching vessels from St. Andrews (and Deer and Campobello islands as well, given their geographic position) have to travel farther than the tour vessels on Grand Manan Island to view finbacks. This may affect the number of finbacks encountered by operators from or closer to the New Brunswick mainland.

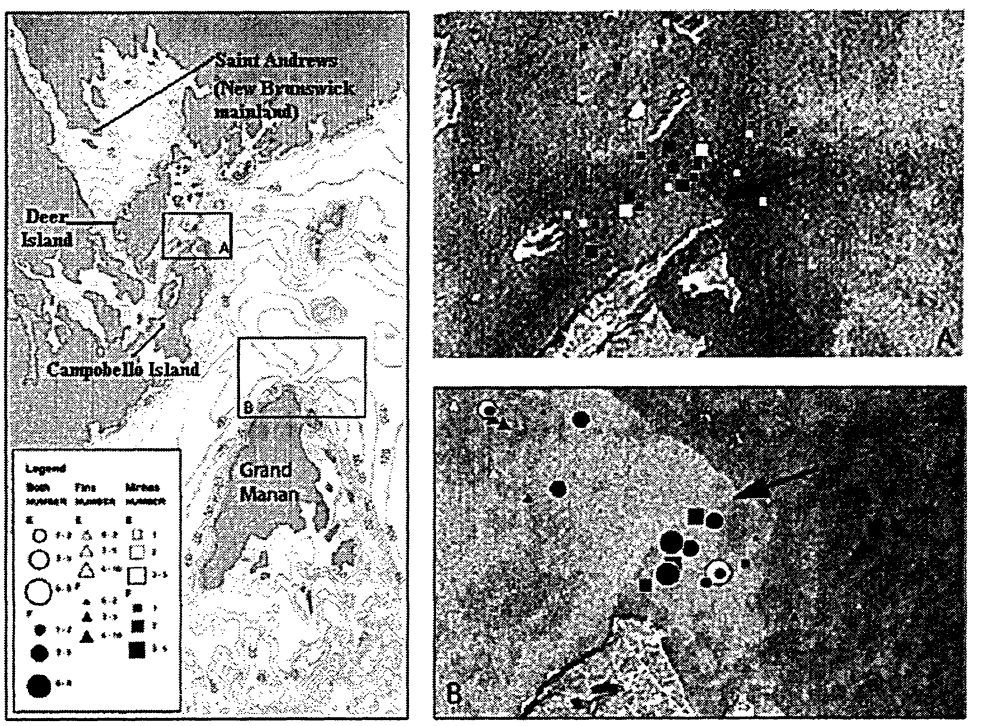

Figure 5.5 The locations of sightings of finback and minke whales with respect to satellite images of tidal wakes established during flood tides at (A) the northern tip of Campobello Island and (B) the northern tip of Grand Manan Island. Minke schools are represented by squares, fin whales by triangles and mixed species by circles *(modified from Ingram et al., 2007, p. 152).*

The effects of variability in the spatial and temporal distributions of whales on marine tourism activities have been documented in other studies, notably by Duffus (1996). In his research, Duffus (1996) investigated spatial changes in the feeding behaviour of grey whales (*Eschrichtius robustus)* in southern Clayoquot Sound, B.C., and found that from 1991 to 1994, there was a spatio-temporal shift in the foraging sites of

the whales successively away from the key whale-watching port in Tofino. According to the researcher, this shift in the whales' foraging behaviour led to a significant increase in the travel distances of whale-watching vessels, from 10 km in 1991 up to 30 km in 1994. Duffus (1996) further discussed the implications of his findings for the whale-watching fleet in the region. Specifically, he noted that travel distance and vessel fuel costs are positively related; thus having to travel farther to view whales means increased fuel costs to operators, increased complications related to trip times (i.e. boats have less time to view whales, which may affect customer satisfaction) and an increased influence of weather conditions (e.g. high seas). All this indicates that there is a distance threshold point where it becomes economically unviable for tour operators to view cetaceans. The results reported by Ingram et al. (2007) showing that finback whales are indeed concentrated farther offshore from the New Brunswick mainland than other target species (e.g. minke whales) may be an indication that the tour operators from or closer to the mainland are encountering fewer finbacks partly due to the costs of having to travel farther to view these whales and not necessarily due to actual changes in the distribution or number of finback whales in the region. Based on Figure 5.5, it appears that the Grand Manan operators, however, do not have to travel as far to view this species. This may explain why the Grand Manan operators did not cite similar declines in the frequency of their encounters with the whales.

However, if the finback whales are indeed feeding farther offshore than in previous seasons and this trend continues, this does not bode well for the operators in St. Andrews, Deer Island and Campobello Island in terms of their continued success in viewing finbacks, particularly in light of findings from the customer questionnaires

showing that finbacks are the second most preferred whale species (behind humpbacks) and the second most expected species (behind minkes). Ultimately, empirical research on finback whales in the lower Bay of Fundy is necessary to ascertain whether or not there have been spatial and temporal changes in the distributions of this species.

5.6 Perceptions of the environmental sustainability of the whale-watching industry

The tour operators were asked to assess the environmental sustainability of the whale-watching industry in the lower Bay of Fundy, New Brunswick region. About half of the operators (N= 5) perceived that the sustainability of the industry was based on certain conditions, such as the number of tour vessels in the region and the health of the herring stocks. Only one of the operators had an especially optimistic view of the environmental sustainability of the industry, stating that the whale-watching industry could "go on forever." The majority of the operators (N= 7), however, expressed some concern about the future of the industry and the region as a whole, including, but not limited to: the long-term ecological impacts of non-compliance with the Code of Ethics, over-fishing/depletion of whale feed stocks, the ecological impacts of the number of tour boats/too many boats, whether the whales will continue to feed in the Bay of Fundy, and the ecological impacts of poor whale-watching conduct by recreational/pleasure boats. There was also strong opposition amongst the operators to the proposed LNG terminals in Maine (as discussed in Chapter two). Two of the operators also felt that environmental threats to the whales in the lower Bay of Fundy were linked to activities in the North-eastern U.S., such as the fishing practices in Maine. According to one of the operators:

> Over-fishing might be a factor too cause there are a lot of large boats especially down the Maine coast that are mid-water trollers for herring so if they catch all the herring up and deplete that source then that's gonna

starve the whales up. That could be a danger to them as well.

Similarly, another operator noted that:

> The fishing gear, either the nets or boat strikes, are an issue but to me, it's netting and lobster fishing down along the American coast. Nobody ever mentions that. All these whales that you hear about on the news coming into the Bay of Fundy being caught with nets, most of those are not Bay of Fundy nets. Those are all nets that they come in with from down along the New England coast. Nobody ever mentions it.

Many of the concerns voiced by the operators were related to changes the operators have observed in the ecosystem health of the Bay of Fundy over the years (Table 5.8). Indeed, the majority (N= 9) perceived that the region had undergone or was currently undergoing changes in the natural environment. One of operators compared the present ecosystem with his memories of the region as child, noting that:

> The water is dirtier...cloudy. It seems to have a lot of debris floating in it. And I don't mean large debris like wood and trees and stuff. I'm talking silt or something...that when you look down into the water, you can't see far. I can remember when I was a kid, going out on the boat with my grandfather, no...even when I was scalloping. You could look overboard and you could see rocks on bottom, and I suppose it would be 25 or 30 feet. But you can't do that now. That and plus, the temperature of the water has risen.

Table 5.8 Environmental changes in the Bay of Fundy observed by the tour operators (N= 9; some of the operators provided more than one response)

1. Decreases in the herring population/number of herring weirs	4
2. Less productivity on a whole ecosystem level	1
3. Pollution from aquaculture	1
4. More surface feeding on krill by the whales	1
5. Shorter summers (i.e. less days of sun and more foggy and rainy days)	1
6. Warmer water and increased turbidity	3

A thorough discussion on each of the regional environmental changes noted by the operators would be necessary to effectively evaluate the potential implications of the operators' observations on the whales and whale-watching industry in the area. Such a discussion, however, is beyond the scope of the present paper. Nevertheless, the overall message from the operators that significant environmental changes have occurred in the Bay of Fundy can briefly be discussed through comparisons to the literature.

The ecology of the Bay of Fundy has been studied by a number of researchers, several of whom have reported ecological changes in the region over the past half century, such as Carruthers et al. (2005), who studied the diet and feeding ecology of pollock (*Pollachius virens)* from the Scotian Shelf and the Bay of Fundy. The researchers compared data on the stomach contents of pollock collected from 1958-1967 with similar data from pollock collected from 1996-2002. They found significant differences between the samples from the two periods, including a higher occurrence of empty stomachs, decreased feeding activity on euphausiids (i.e. krill) (*Meganyctiphanes norvegica)*, and a decreased 'plumpness' of the pollock in the more recent collection period. The researchers found that the decreased feeding on euphausiids corresponded with a significant decline in the abundance of this prey in the region. Their findings adds weight to the evidence that "changes in the feeding ecology and productivity of commercial fish species [are] linked to temporal and regional-scale changes in the marine environment of the North Atlantic" (Carruthers et al., 2005, p. 327).

Environmental changes in the Bay of Fundy region have also been noted over even longer time scales. For example, Lotze and Milewski (2004) used archaeological, historical and recent data to create an "ecological history" of the Quoddy Region in the

lower Bay of Fundy. According to the authors, there have been considerable changes in all the trophic levels of the Quoddy region ecosystem starting in the late 1700s with European colonization of the area. For example, the authors reported that by 1900, three mammal and six bird species had become extinct in the area due to over-exploitation. Lotze and Milewski (2004) also noted the declines in diadromous fish (e.g. Atlantic salmon) populations due to river damming in the early 1800s and subsequent river pollution, as well as the collapse of groundfish stocks in the 1970s due to over-fishing which began in the late 1800s. The authors reported that the 20th century has seen changes such as a shift in the aquaculture and fisheries industries in the region to low trophic level organisms, and changes in seaweed and phytoplankton communities due to eutrophication. Based on these findings, Lotze and Milewski (2004, p. 1428) concluded that:

> Today, the once unique Quoddy Region shows the most common signs of degradation found in highly impacted coastal areas worldwide. Multiple human influences have altered the abundance and composition of every trophic level in the food web and reduced upper trophic levels by at least one order of magnitude.

A recent publication released by the Gulf of Maine Council on the Marine Environment provided further insights into the environmental changes that have occurred in the lower Bay of Fundy region. The Council set up a Climate Change Network Task Force in 2003 to investigate and report on climate change issues in the Gulf of Maine and the Bay of Fundy (Wake et al., 2006). In the subsequent publication released by the Task Force, entitled "Cross Border Indicators of Climate Change over the Past Century," researchers from agencies such as Environment Canada and the University of New Hampshire analysed meteorological data from 1900 to 2002 on various climate change

indicators for the North-eastern U.S. region and the Canadian Maritimes provinces (Wake et al., 2006). The focal region of the publication encompasses the tour operations in St. Andrews and the Fundy Isles.

Similar to the historical changes in the ecosystem of the Bay of Fundy noted by Lotze and Milewski (2004), the Climate Change Network Task Force reported findings that indicate that long-term climate-related changes have occurred in the region (Wake et al., 2006). Several of the climate trends reported in the publication indeed coincide with the tour operators' observations of environmental changes in the Bay of Fundy. For example, recall that a few of the operators (N=3) perceived that the water temperature had become warmer. Corroborating this observation are the findings reported by Wake et al. (2006) that the over the past century, the surface water temperature in the North-eastern U.S. and the Canadian Maritimes region has risen on average by 0.50 to 0.66° C (Table 5.9). According to the authors, this rise "represents a tremendous amount of excess energy that is being taken up by the ocean's surface waters" (Wake et al., 2006, p. 21).

Table 5.9 Trends in sea surface temperature in the "Cross Border Region" (modified from Wake et al., 2006, p. 21).

Location	103 year trend (°C)	33 year trend (°C)
Gulf of St. Lawrence	0.50	0.69
Southeast of Nova Scotia	0.59	0.56
Gulf of Maine*	0.61	0.21
NY & NJ	0.66	-0.02

* the study region is included in this ocean temperature region

Other regional climate changes over the past century were reported in the Climate Change Network Task Force publication, including: a warming trend in the average annual temperature, an increase in the amount of precipitation by an average of 129 mm (12 per cent), and a rise in the sea level in Atlantic Canada by approximately 250 mm since 1920 (Wake et al., 2006).

Whether any of the climate-related changes reported in the Climate Change Network Task Force publication is currently impacting or will impact the whales in the lower Bay of Fundy cannot be attested to in this present paper. Results from the publication and findings reported earlier by Lotze and Mileski (2004) and Carruthers et al. (2005) are used here to demonstrate that the operators' observations about ecosystem changes in the region corresponds with evidence from the literature. The potential impacts of such changes on the whale-watching industry may not be manifested for years. However, the indication from the literature is that the Bay of Fundy ecosystem has undergone significant changes in the past and is still experiencing environmental changes. This may be a matter of concern for the future ecological viability of marine tourism activities in the region, particularly if these changes are shown to affect the distribution and prevalence of whales in the region. After all, the sustainability of whale-watching activities is undoubtedly related to the state of the marine ecosystem in which the whales reside and carry out their life processes (Lien, 2001).

5.7 Marketing and advertising of the tour companies

5.7.1 Introduction

Most of the operators (N= 7) stated that they were members of a tourism board or association; five of these operators do some advertising through their respective tourism

associations. A few of the operators (N= 3) made mention of a local whale-watching association (i.e. The West Isles Whale-watchers Association) that was once established for the tour operators in the region. According to these operators, not much has been done through this association and the group, for the most part, has dissolved.

The operators advertise and market their business primarily through the internet (e.g. company websites; N=10); through the provincial tourism booklet/guide or tourism website (N= 8); or by publishing and distributing their own brochures/booklets (N= 10).

5.7.2 Perspectives of the tour operators regarding the marketing and advertising of the tour businesses

There was a strong sense from a number of the operators (N= 5) that the success of their business was linked to the direction of the marketing and advertising of the industry and the region as a whole. One tour operator in particular emphasized his observation that the manner in which whale watching has been marketed over the years has driven customers to expect more from a whale-watching trip, especially expecting to see humpbacks. According to this operator, the marketing of whale watching has promoted less realistic and less "responsible" whale-watching conduct. He described the marketing and advertising of whale watching as a "double-edged sword" (i.e. marketing and advertising brings tourists to the region for whale watching but also creates expectations that are difficult to live up to).

Another tour operator also made several notable comments regarding the marketing and advertising of the region's whale-watching industry. This tour operator proposed that the operators in the region should band together (not necessarily join businesses) but work together as a whole to compete with the whale-watching industries

of the North-eastern U.S. He also suggested that the Bay of Fundy tour operators were currently charging too little for their tours and should stop competing with each other and instead "carve out a niche market" to offer a different whale-watching experience to challenge the industries in other regions.

These thoughts were reiterated by two other operators who called for "more progressive" and consolidated regional and provincial marketing of whale watching and tourism. According to one of these operators:

> To be a good solid business to me, where you have the cash flow or the income to look at developing your business further with either upgrades to your vessel or proper maintenance and all these things and better marketing, reaching out for market, I don't think we're there. I think because of the competition, it's kept everybody's income to a point where no one's gonna be able to kinda break out and create a business that's really vibrant; a business that can really stand on its own in terms of its marketing capability. There's room for a few operations in this area unless, and this is not just us, it's the whole of the province together as well as St. Andrews, the region has to be more progressive in its marketing of the area. It's not just the whale watchers can't do it on their own. The whole region just has to...Because I think we'll continue to see tourism drop off in this area if there's not some strong investment in the advertising and marketing area.

5.7.3 The marketing of the town of St. Andrews

Comments by two of the operators on the islands suggest that the town of St. Andrews itself, particularly its characterization as a resort destination, is a source of competition for the tour businesses on the islands. According to one of these operators, tourists leave or by-pass the islands to spend the day in St. Andrews and thereby, the town itself has more negative effects than the whale-watching businesses.

These sentiments corresponded with remarks made by two other operators from St. Andrews who suggested that the appeal of the town, as a tourist area, provided a base

for whale-watching operations, as opposed to on the islands (namely, Deer and Campobello islands) where the tourist base, in their opinion, was not as strong.

The operators' comments are reflective of the disparity between St. Andrews and the Fundy Isles in the extent and manner in which the locations are marketed by New Brunswick's Department of Tourism and Parks. This is most notable in the province's yearly published official travel guide. In the 2006 guide, nearly five pages are dedicated to tourist attractions and accommodations in St. Andrews. The guide also markets St. Andrews as "Canada's oldest seaside resort town" (New Brunswick Department of Tourism and Parks, 2006a, p.134). Comparatively, for Deer, Campobello and Grand Manan islands, the caption reads: "Experience Island Life," while only one page is dedicated to each island (New Brunswick Department of Tourism and Parks, 2006a, p.137-140). There were several comments during the tour operator interviews about the differences in the way the province markets St. Andrews and the Fundy Isles. In one such comment, frustration with the province's tourism agency is clearly evident:

> ...they gotta advertise Campobello as a whole place. And they done this one time. We had a good tourist base come here. It was. They were coming; they'd stay in the motels and stuff. Then these geniuses that they've hired to market tourism in New Brunswick at the government level, has taken this not from a destination but to a day adventure. Campobello is a day adventure now; St. Andrews is a destination. That didn't help.

The disparity in the marketing of tourism activities between the locations is reflective of the differences in the development of the tourism industry between the St. Andrews and the islands. It is evident from New Brunswick's official travel guide that the tourism sector is far more developed in St. Andrews than on the islands, and many businesses and establishments in the town cater to the tourist flow (e.g. The Fairmount Algonquin four-star hotel resort and golf course academy, the Kingsbrae Garden Tour,

kayaking and canoeing tours, several national historic sites (e.g. the St. Andrews Blockhouse), and the Huntsman Marine Science Centre Aquarium/Museum). This point is consistent with remarks made by the tour operators about the "tourist town" appeal of St. Andrews.

Moreover, while all the tour operators in St. Andrews and Grand Manan Island are advertised in the 2006 provincial travel guide, only one of the two operators on Campobello Island is advertised and there are no whale-watching operators listed for Deer Island. Since the advertising provided by the province is linked to market readiness and product development criteria, it appears that the tour businesses in St. Andrews and Grand Manan Island are generally more market ready and developed than the businesses on Campobello and Deer islands specifically. This is not surprising, given that the tour operations in Grand Manan and St. Andrews are amongst the oldest in the region and carry the most passengers (Figure 3.1; Table 4.2). On the whole, the findings suggest that the viability of the whale-watching businesses in the former two locations is more vulnerable, whereas the businesses on Grand Manan Island and St. Andrews are reinforced by the marketing provided by the province and those in St. Andrews in particular can rely on the tourist appeal of the town as a draw for customers.

5.7.4 Perspectives of the whale-watching customers regarding marketing and advertising of the tour businesses

Results from the questionnaires provided insights about the ultimate impact of advertising on the whale-watching customers. Most of the respondents who were visitors to the region (87.7 per cent) were aware of the whale-watching opportunities in the region before their arrival and fair proportion (44.9 per cent) indicated that whale

watching was the primary purpose of their visit to St. Andrews and/or the Fundy Isles. Advertising (e.g. on the internet, in tourism booklets/brochures, signage, etc) was found to be especially important in raising customer awareness about the whale-watching tours in the region. Indeed, over half of the respondents (54.8 per cent) first became aware of their particular tour operator through some form of advertising. Tourism booklets/brochures were the most common source of awareness, representing 30.7 per cent of the total responses for that particular question.

The fact that most of the customers were aware that whale-watching opportunities existed in the region before their arrival is indicative of the extent to which the region has developed as a whale-watching area. Indeed, these results indicate that the whale-watching industry in St. Andrews and the Fundy Isles is fairly well-marketed outside the local region and that tourism booklets/brochures are highly important marketing tools.

However, while advertising appears to be the most common avenue through which the customers become aware of the whale-watching tours in the region, the results also indicate that advertising itself is not an important component in the customers' decision to participate in whale-watching activities or in their choice of a particular tour operator. This is best exemplified by Figures 5.6 and 5.7, which show the importance of advertising on television and in tourism booklets/brochures to the customers' motivations to go whale watching.

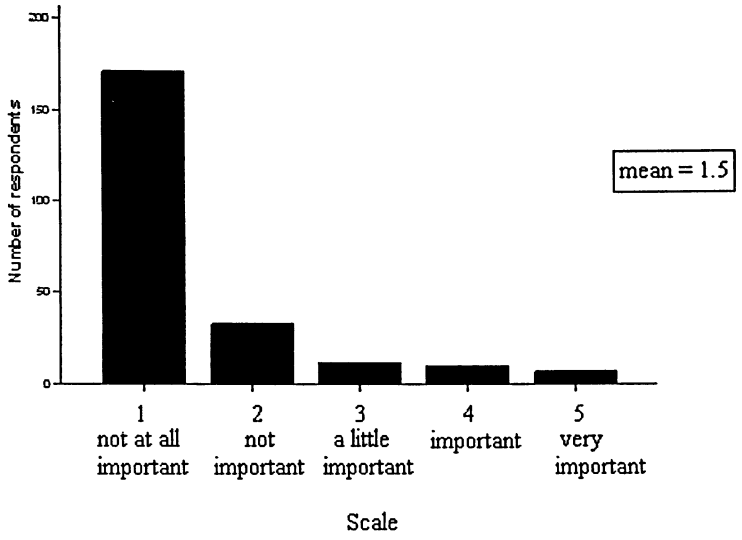

Figure 5.6 The importance of advertisements on television to the customers' decision to go whale watching on a 5-point scale (N= 233)

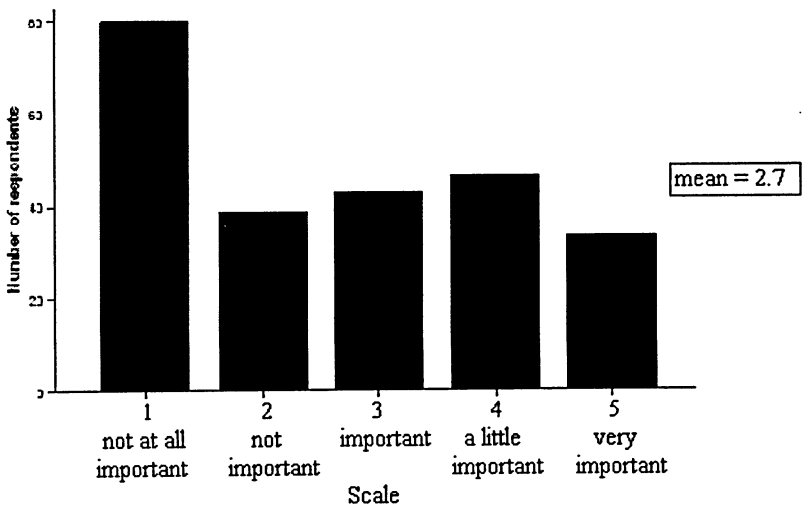

Figure 5.7 The importance of advertisements in tourism booklets/brochures to the customers' decision to go whale watching on a 5-point scale (N= 243)

Both of the above figures demonstrate that advertising is generally unimportant to the customers' decision to go whale watching (although advertising in tourism booklets/brochures appears to be more important). This is also evident in the customers' responses regarding the specific reason why they chose their particular tour operator. Although tourism booklets/brochures were the most common source from which the

respondents first became aware of their tour operator, as noted above, only 13.8 per cent of the time, the respondents chose a particular operator because of their advertisements in such booklets/brochures. The same trend was seen for all the other forms of advertising. Indeed, although 54.8 per cent of the time, the respondents became aware of their tour operators through some form of advertising, less than a quarter of the time (23.0 per cent), the respondents chose a tour operator specifically because of advertising.

The implication of these findings is important because it helps dispel the belief that having the most dramatic advertisements draws more customers, a belief that was expressed by one of the tour operators. Evidently, advertising is not as important to the customers' decision to participate in whale watching as other factors, such as the scenery and wildlife. These are the prime customer motivations (Figures 4.6 and 5.8).

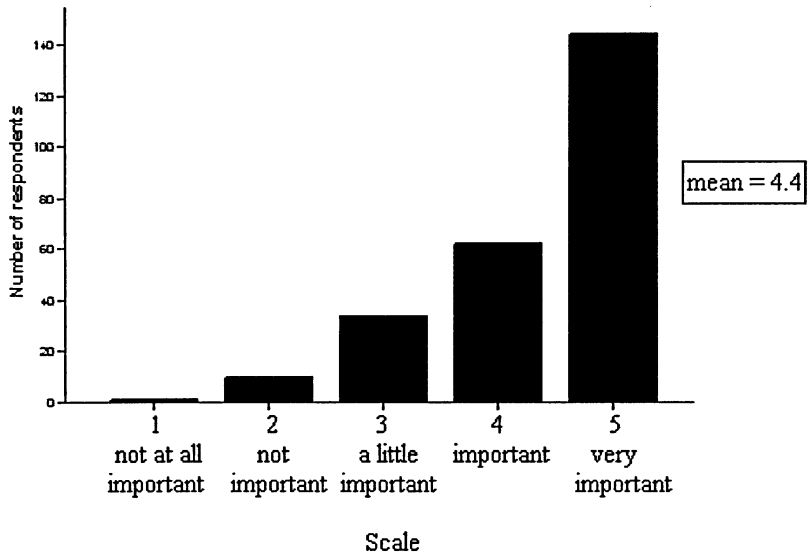

Figure 5.8 The importance of scenery to the customers' decision to go whale watching on a 5-point scale (N= 251)

5.8 The number and flow of whale-watching customers

5.8.1 Seasonal fluctuations in customer demand for whale watching

For all the tour businesses, customer flow peaks in July and August, with slower periods in the beginning (i.e. May and June) and end of summer (i.e. September and October). Most of the tour operators (N=9) indicated that they make adjustments to their tours in response to the changes in customer flow within the whale-watching season. The operators have a number of ways of adapting their tours to the slow and peak periods of the season (Table 5.10).

Table 5.10 How the tour operators adapt their tours during slow and peak periods in customer flow

Adaptations during slow periods	
1. Drop the daily number of tours	4
2. Reduce the number of staff	4
3. Change the nature of the tour (e.g. offer a nature tour or fishing trip)	3
4. Rely on established tour groups as the base	1
Adaptations during peak periods	
1. Shorter trip times	1
2. Tours focus solely on viewing whales	2
3. Add more staff or have staff on stand-by	2
4. Add more tours	2

5.8.2 Customer flow in the town of St. Andrews

Corresponding with the earlier discussion on the tourist town appeal of St. Andrews, the general consensus from the tour operators was that St. Andrews has a more consistent tourist flow and a bigger customer base than the islands. This is reflected by the fact that the operators in St. Andrews run the highest number of daily tours (e.g. as many as four tours per day at the height of the season), while the operators on Grand Manan and Deer islands run the least (usually one or two tours per day, and occasionally up to three tours per at the height of the season). Furthermore, first-hand observations by the researcher also strongly suggest that the flow of customers is less consistent and more variable for tour operators on Deer Island and Campobello Island, specifically. This was highlighted by the difficulties in obtaining the necessary number of completed customer questionnaires for the businesses on the two islands during data collection.

Asides from the marketing of St. Andrews as a tourist resort destination, another potential reason for the stronger tourist base perceived in St. Andrews may be related to the fact that the town is on the mainland. Indeed, the travel distance from the New Brunswick mainland to the Fundy islands may discourage potential participants from traveling to the islands to participate in whale-watching activities; this may partly explain why St. Andrews sustains a higher number of whale-watching businesses. For example, it takes approximately one and a half hours by toll ferry from Blacks Harbour, New Brunswick (the mainland ferry terminal) to Grand Manan Island (Coastal Transport Limited, 2007). The travel distance to Blacks Harbour is an additional consideration (Table 5.11). This issue was raised by one of the operators who noted that:

St. Andrews has the people and so people are there; it's easy. It's a two-hour

> trip. Most people don't wanna commit four hours, five hours. If they're on the mainland, they don't wanna commit to an hour and half ferry ride to go on a four hour whale watching. That's the whole day. So it's very attractive for them to go down to the wharf [in St. Andrews]: 'Oh it's a two-hour trip; it's $40.00. Let's go.'

Having to take a ferry to reach the islands also requires one to be dependent on a structured ferry schedule. This may also deter those who do not plan ahead to participate in whale-watching activities.

Table 5.11 Distance (km) from major mainland locations in New Brunswick to Blacks Harbour (the ferry terminal to Grand Manan Island)
(modified from Coastal Transport Limited, 2007).

Location	Distance (km) to Blacks Harbour
St. Andrews	27
St. John	75
Fredericton	178
Moncton	227
Edmundston	456

5.8.3 Trends in the number and flow of whale-watching customers

When asked about overall trends in the number and flow of customers to their businesses over the years in operation, there were a variety of responses given. It appears that those operators who have made significant changes to their tours in recent years (e.g. moved business to a different town or obtained a bigger vessel) have experienced increases in the number of customers on their particular tours (N= 4). However, the overall assessment of customer flow from the majority of the operators (N= 7) was that tourism in the region in general has been down in recent years. Many operators (N= 6),

specifically noted a decline in the number of American tourists (especially after the terrorist attacks on September 11, 2001).

Recall that the majority of the tour operators (N=8) noted that the whale-watching industry in the region had become more competitive for customers over the years. Two of the operators perceived that the decline in tourist visitation to the region has contributed to competition between the tour businesses. According to one of these operators:

> The whole industry is in decline just because tourism as a whole is in decline...the reduced number of travelers, the reduced whale-watching passenger base has forced a lot of competing companies to get more competitive...At one point, there was so many people around, you could put a bathtub in the water, throw up a sign and you'd probably get enough people to make it work because there was enough around to do that. But as the market tightens up, people have had to be more competitive with the pricing, and what they offer, guarantees and those types of things.

These anecdotal observations about the declines in tourism are corroborated by actual trends in the number of non-resident visitors to the local region (i.e. Charlotte County).

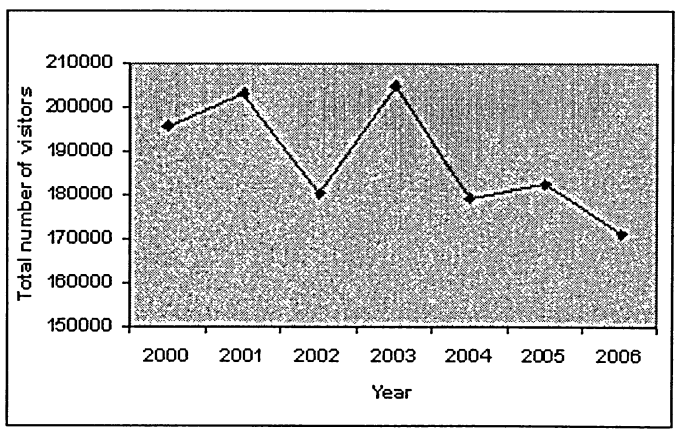

Figure 5.9 Total number of visitors to Charlotte County attractions between May and October (2000-2006) *(numbers in the figure were made available by D. Rioux, Senior Research Analyst for New Brunswick's Department of Tourism and Parks, personal communication, July 30, 2007)*

As can be seen from Figure 5.9, tourist visitation to Charlotte County has fluctuated in recent years but has steadily declined since 2003. In fact, the 2006 tourist season (May to October) was the worst year for tourist visitation to attractions in the county since the turn of the century.

This decline in the tourist visitation is not specific to Charlotte County alone. Indeed, the total non-resident visitation to the Province of New Brunswick and occupancy rates in the Atlantic Canada region as a whole have also shown a similar trend in recent years (Figures 5.10 and 5.11).

Figure 5.10 Total number of non-resident visitors to New Brunswick (2002-2006) *(New Brunswick Department of Tourism and Parks, 2003; 2004b; 2005; 2006c; 2007a)*

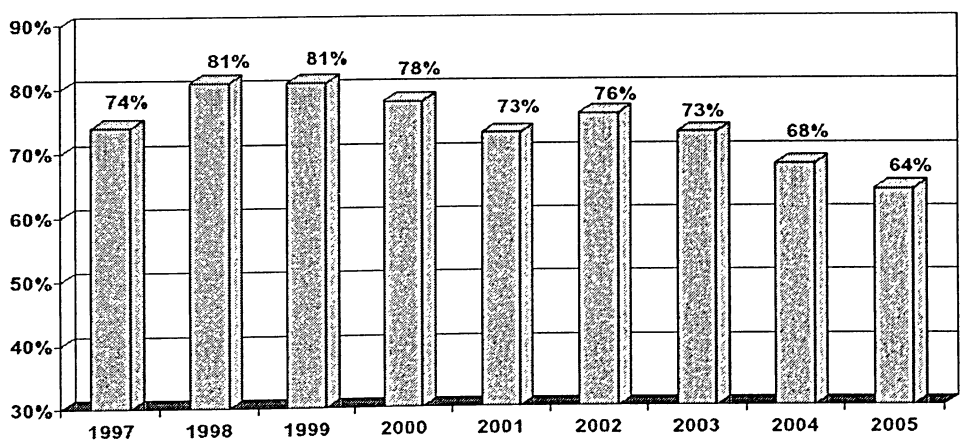

Figure 5.11 Atlantic Canada occupancy rates (1997-2005) *(modified from New Brunswick Department of Tourism and Parks, 2006b)*

Figure 5.11 illustrates the 9-year trend in occupancy rates in Atlantic Canada. In 2002, occupancy rates rose by 3 per cent from the previous year. This suggests a recovery in tourist visitation after the terrorist attacks on September 11, 2001, as noted earlier. However, since 2002, occupancy rates have fallen to their lowest point in the past decade. This indicates that there are a number of other factors which are currently dampening tourist visitation. Poor weather, the price of fuel, the exchange rate and a weak U.S. economy were suggested by the tour operators as potential contributors. These explanations generally corresponded with comments made by David Rioux, a senior research analyst with New Brunswick's Department of Tourism and Parks. According to Mr. Rioux, recent travel intentions surveys conducted by the province indicate that key tourism markets, such as U.S. visitors, are limiting their travels and staying within their own local regions due to poor economic and financial factors, gas prices and the exchange rate (D. Rioux, personal communication, July 30, 2007).

The recent downward trend in tourist visitation to New Brunswick may partly explain the strong sentiments expressed by all the operators that the region as a whole and St. Andrews in particular, could not sustain any more whale-watching tour businesses than the present number. According to one operator:

> None of us want here any more operators. There's no room for any more. Nobody wants another boat in the town. All the boats that have been here have been here for years...There's no excess passengers. There's extra seats available right now in town and there has been for years.

The decline in U.S. visitation to New Brunswick is reflective of the current trend in the tourism market in Canada as a whole. According to a recent report from Statistics Canada, spending by Canadians on tourism in Canada was up 1.8 per cent for the first

quarter of 2007, the 11th consecutive quarterly increase in domestic spending since second quarter of 2004 (Statistics Canada, 2007b) (Figure 5.12). The opposite trend has occurred for international traveler expenditure, particularly in the U.S. market (Figure 5.13). The report indicates that the number of non-resident travelers to Canada fell by 6.7 per cent for the first quarter of 2007, with declines in the number of same-day and overnight visitors from the U.S. for the 10th consecutive quarter. Overall, tourism spending by foreign travelers in Canada has experienced a decline of 13 per cent since the end of 2004 (Statistics Canada, 2007b).

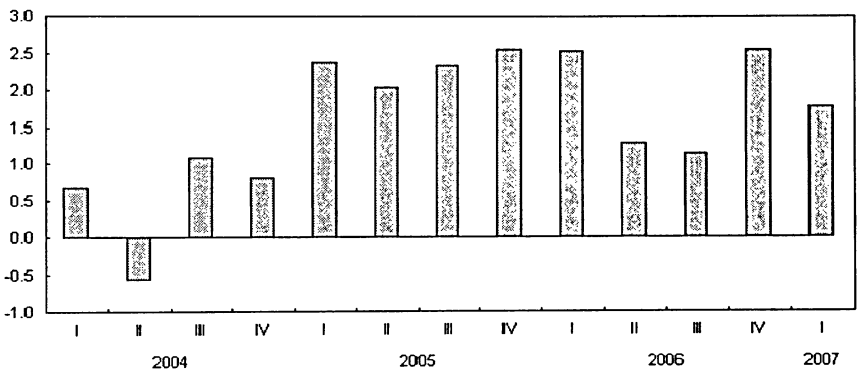

Figure 5.12 Percentage change in domestic tourism spending in Canada by quarter (2004-2007) *(modified from Statistics Canada, 2007b, p. 8)*

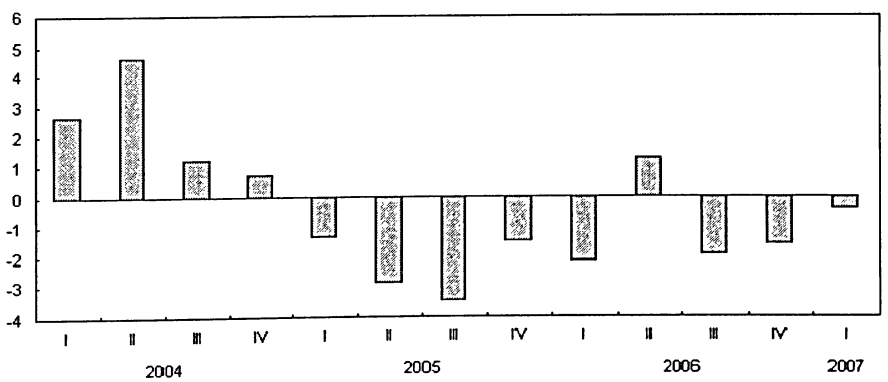

Figure 5.13 Percentage change in non-resident tourism spending in Canada by quarter (2004-2007) *(modified from Statistics Canada, 2007b, p. 9)*

The implication of Figures 5.12 and 5.13 is that domestic tourism is compensating for declines in international and U.S. visitation. One of the tour operators' observations about changes in the travel origins of the passengers on his tours reflected this trend:

> For us, [the number of customers] is increasing for local people in New Brunswick and a big jump in people from Ontario but that'd be with everybody this year. Seems like less Americans coming up; a lot more people from Quebec and Ontario and again, we had a trip yesterday, the whole trip was all local people.

Such a shift in the tourism market, however, is likely not to be positive for the whale-watching industry. Indeed, "regional and resident markets are not likely the markets whale-watching [operators] require to grow their businesses" (D. Rioux, personal communication, July 30, 2007), particularly given the indication that international visitors spend more than domestic travelers (Warburton et al., 2001; Hoyt, 2001). International travelers to New Brunswick are also highly interested in nature, coastal and wildlife experiences (D. Rioux, personal communication, July 30, 2007). As such, this sector represents a potentially reliable market that would be interested in whale-watching activities. The decline in the international traveler market in the region and across the country further emphasizes the need to raise the international profile on the whale-watching industry in the lower Bay of Fundy as identified in Chapter four. Moreover, the U.S. tourism market is important to the economic sustainability of the whale-watching businesses in St. Andrews and the Fundy Isles. Recall that nearly 30 per cent of the whale-watching customers indicated that they had traveled from the U.S. (Figure 4.4). A shift in the tourism market to domestic travelers will likely negatively impact the viability of whale-watching operations in the region, particularly on

Campobello Island, where both operators stated that the majority of their business comes from the U.S.

It should be noted, however, that Figures 5.9 and 5.10 only illustrate very recent trends in tourist visitation to New Brunswick. Examining long-term data may provide a more comprehensive portrayal of the tourism market and may also provide useful insights into the recent decline in visitation. Such information was available in the 2002 version of the annual "Tourism Industry Performance" publication from New Brunswick's Department of Tourism and Parks. Figure 5.14 below shows annual and July/August occupancy rate percentages for the province from 1990-2002.

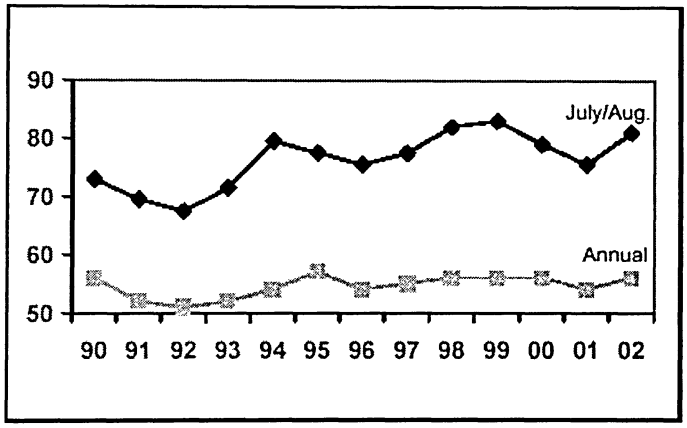

Figure 5.14 Annual and July/August occupancy rate percentages for New Brunswick (1990-2002)
(modified from New Brunswick Department of Tourism and Parks, 2003, p. 3)

As shown in the above figure, there is a cyclical, "peak and trough" pattern in the provincial occupancy rates. This oscillation in the tourism industry was alluded to by one of the tour operators, who observed that: "Most markets are cyclical. I think we're moving into a down cycle at this point. I think this down cycle is probably going to continue." The recent decline in tourist visitation to New Brunswick (as illustrated by

Figures 5.9 and 5.10) suggests that the tourism market in the province is indeed in a "down cycle," but given the historical trends, this downturn may only be temporary, which bodes well for the whale-watching operations and tourism in general in the province.

Nonetheless, a continued decline in tourist visitation should raise concerns for the whale-watching industry in St. Andrews and the Fundy Isles, particularly for the businesses which already appear to be at a competitive disadvantage. Indeed, there was some evidence that the decline in tourist flow is already affecting the tour businesses. When asked about specific changes, if any, that they have made to their tours in response to the observed decline in tourism, two of the operators replied that they have made or will make some changes to the way the run their tours. One of these operators revealed that he plans to shift the focus of the advertising for his business and do more local advertising within the local region (i.e. Charlotte County). Another operator indicated that he has scaled back on the number of scheduled whale-watching tours. He has also added an additional lighthouse and sunset tour and has had to reduce the number of staff.

Using the trends in occupancy rates as a measure of tourist visitation to New Brunswick, it becomes apparent that there are regular fluctuations in tourist flow to the province. The tour businesses are thereby subject to these fluctuations. To remain viable, the operators must be able to sustain their businesses though the down cycles in tourist numbers. The overall implication of the available evidence is that the older businesses (who often carry more passengers) and the businesses in St. Andrews in particular have the greatest capacity to do so.

5.9 Customer satisfaction with the tours

Results from the questionnaires regarding customer satisfaction with the tours were highly favourable of the tour operators and the whale-watching operations in the region. Nearly all of the customers (96.0 per cent) indicated that they were either satisfied or very satisfied with their overall experience on the tour (Figure 5.15).

In fact, the responses to several questions on the survey demonstrated that the tour experience was particularly satisfying. For example, 71.0 per cent of the customers felt that the tour was "definitely worth" the cost of the tour; 97.6 per cent reported that based on their tour experience, they probably or definitely would go whale watching again; and 98.3 per cent indicated that they probably or definitely would recommend whale watching in general. Ultimately, these findings suggest that the whale-watching tours in the lower Bay of Fundy region provide a high quality wildlife-viewing experience.

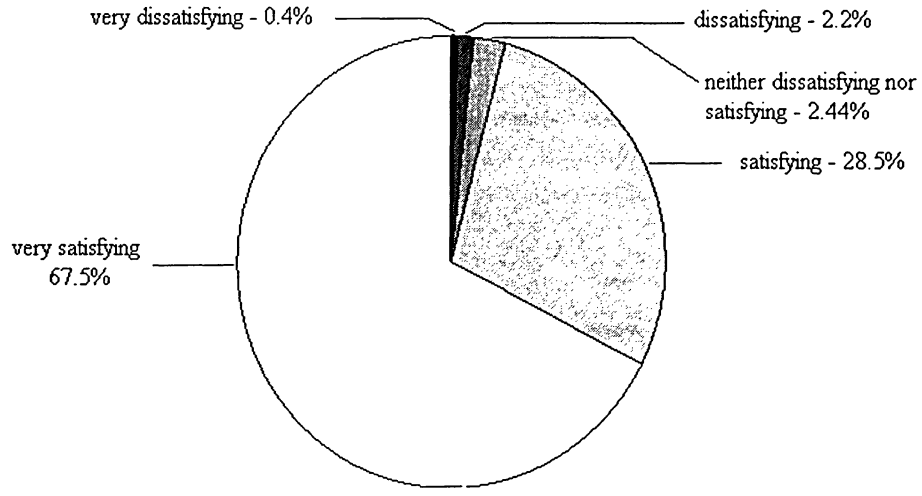

Figure 5.15 Customer satisfactions with overall tour experience (N=246)

The high level of customer satisfaction in this study is not surprising given the results from several other studies on tourist responses to viewing or interacting with

cetaceans. For instance, Orams (2000) found that 78 per cent of whale-watching passengers on tours from the Tangalooma Island Resort in Queensland, Australia were extremely satisfied or satisfied with their tours; 98 per cent of whale-watching customers on tours from the Isle of Skye, Scotland reported that there were happy with the cost of the trip (Wood-Ballard, 2000); and Birtles et al. (2002) reported a mean satisfaction score of 9.00 (out of a 10 point scale) with dwarf minke whale interactions in the northern Great Barrier Reef, Australia.

The high level of customer satisfaction is also not surprising given the indication that the tour experience matches the customers' expectations. Indeed, the customers may be satisfied because their expectations regarding their interaction with the whales and the other marine wildlife are, for the most part, being met or exceeded (Figures 5.16 and 5.17). These findings correspond with the majority of the tour operators (N= 10) in their belief that tour experience meets or exceeds the customers' expectations.

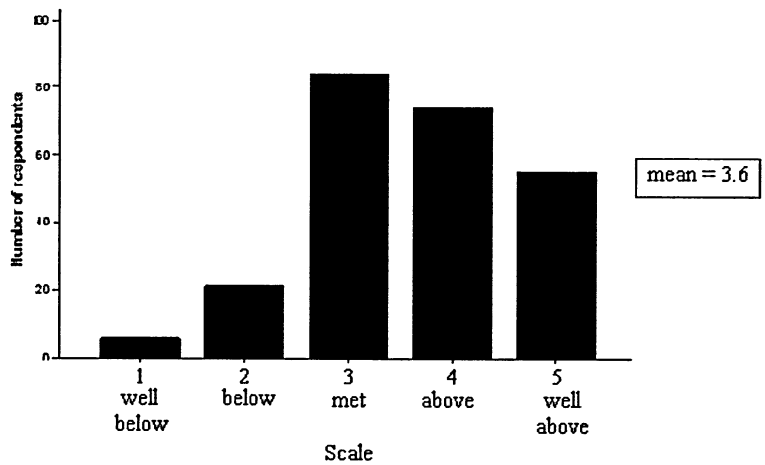

Figure 5.16 Distribution of the whale-watching customers regarding how well the overall interaction with whales matched expectations on a 5-point scale (N=240)

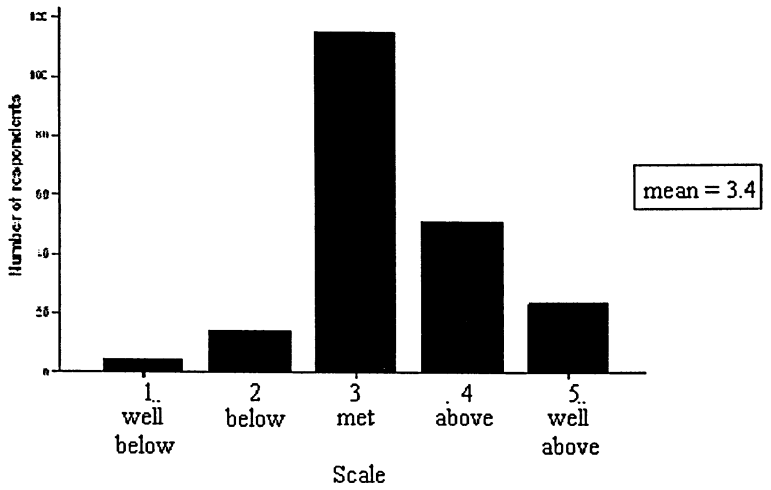

Figure 5.17 Distribution of the whale-watching customers regarding how well the overall interaction with the marine wildlife other than whales matched expectations (N=209)

5.9.1 Improvements to the tours

Despite the high rating of their overall tour experience, however, nearly a third (32.8 per cent) of the customers felt that their interaction with the whales could have been improved. More sightings (20.0 per cent of the total responses), longer sightings (16.8 per cent), closer approaches (15.5 per cent) and type of behaviour (14.5 per cent) seen were the most commonly chosen improvements. In addition, 16.0 per cent of the whale watchers felt that the information they received during the tour was somehow lacking. Scientific/natural history and general information about the whales and the other wildlife in the area were the most common topics on which the customers would have liked more information.

About three-quarters (76.9 per cent) of the improvements to the tour chosen by the customers were whale-related. This indicates that whales and their behaviour, not surprisingly, are the most critical components on which customer satisfaction is based. It

must be acknowledged here that the tour operators have little control over these factors. On the other hand, nearly one fifth (19.8 per cent) of the improvements were non-whale related and within the tour operators' control to some extent, particularly with respect to providing more information about wildlife, which was the leading non-whale related response. Other important non-whale related responses included: fewer customers on the boat (6.4 per cent) and fewer boats in the vicinity (4.1 per cent). These findings reveal that there are a number of factors which affect customer satisfaction besides the whales themselves.

The results presented here are consistent with those reported by Orams (2000), who found that 35 per cent of the whale watchers surveyed on tours from the Tangalooma Island Resort in Queensland, Australia indicated that they were satisfied with the tour even on trips where no whales were sighted at all. Moreover, the researcher found that while whale-related factors (e.g. the behaviour of the whales) were the most important influences on customer satisfaction, there were still a number of other issues that affected their enjoyment, such as: the number of passengers on the boat, the duration of the tour, the construction of the boat, how the position of the boat allowed views of whales and sea-sickness.

The message from the results reported by Orams (2000) and the results in this present study is that customer enjoyment is not solely based on the whales. This ultimately implies that if no whales are seen, there may still be a high degree of customer satisfaction. This is important, because an encounter with a whale in the wild is an inherently variable and unpredictable event and because the tour operators themselves

have little influence over the whales' behaviour. Indeed, as noted by Cloke and Perkins (2005, p. 913), although there may be a

> bountiful presence of cetaceans in [a given area], these animals are dwelling in their own worlds, and, unlike any zoological spectacle, they do not somehow turn up like clockwork for prearranged performance times. Sometimes boats will go out but no whales are to be seen, and dolphins may be scattered rather than congregating playfully in their pods.

However, if the customers are still satisfied even when operators are unsuccessful in finding the focal species, then this renders the businesses less dependent on any potential fluctuations (particularly declines) in the distribution and prevalence of cetaceans in the region. This is consistent with a comment made by one of the operators, who noted that: "As far as the whales part of it, most of the businesses could still operate for a quite few years even if there was only one or two whales."

5.10 Perceptions of the economic sustainability of the whale-watching industry

There was a split in the operators' views on the long-term economic sustainability of the whale-watching industry in the region. Here, there were no location-based or other specific trends in the operators' responses. Five of the operators perceived that the industry had a generally good viability in the future, while six operators had less optimistic views. The operators who felt positively about the future based their opinions on the growth in ecotourism, the appeal of St. Andrews as a tourist town, and the belief that the public fascination with whales would be sustained through education.

However, when asked whether they had any concerns about the future economic viability of the industry, the majority of the operators (N= 7) expressed some concern, many of which were raised at earlier points during the interviews and have been previously discussed (Table 5.12). Finally, consistent with earlier comments about the

viability of whale-watching operations on one of the Fundy Isles in particular, one tour operator felt that the commercial whale-watching industry on this island was "on its way out."

Table 5.12 Concerns of the tour operators regarding the economic sustainability of the whale-watching industry (N=7; some operators provided more than one response).

1. Economic impacts resulting from poor ecosystem/environmental health of the region	3
2. Industrialization/the negative effects of other industries being established in the region	2
3. The direction of the advertising and marketing of whale watching and the Bay of Fundy region as a whole	4
4. The decline in tourism	4
5. The effects of local competition	2
6. Operators charging too little for tours	1

5.11 Chapter conclusion

This chapter has presented results on a number of the factors identified in the related literature as central aspects to the sustainability of commercial whale-watching tourism. These factors have been applied to the industry in the lower Bay of Fundy, New Brunswick region, and through comparisons to the literature, various areas of strength and vulnerability with regards to the sustainability of the industry in the area have emerged. In the next and final chapter (Chapter six), the implications of the data presented above with respect on the management, environmental and economic

sustainability of the commercial whale-watching industry in the region are drawn and the overall strength and vulnerability of the industry is ascertained.

CHAPTER SIX

IMPLICATIONS OF THE RESEARCH FINDINGS

6.1 Introduction

The principal aim of this research has been to gather a set of findings from whale-watching tour operators and customer participants from which critical aspects to the sustainability of the commercial whale-watching industry would be assessed and the overall strength and vulnerability of the industry could be ascertained. The whale-watching businesses in the lower Bay of Fundy, New Brunswick region have served as the focal point of this research. Findings presented in Chapter 5 covered a wide range of issues central to the sustainability of marine tourism activities in the region. In this chapter, the overall implications of these findings for the management, environmental and economic sustainability of the industry are discussed. Through these discussions, areas of strength and vulnerability in the whale-watching industry in the aforementioned region are identified and the main objective of the study is thereby fulfilled. The chapter concludes with a discussion of the limitations of the study and areas in need of future research.

6.2 The implications of the research findings for the management of the commercial whale-watching industry in the lower Bay of Fundy, New Brunswick

There are several implications that can be drawn from the data for the management of whale-watching activities in the lower Bay of Fundy region. These are numbered to facilitate the following discussion.

1. First, with respect to the management of whale-watching activities in the study region, different conclusions can be reached depending on the particular set of findings in question. On one hand, there was an overall positive assessment of tour vessel conduct in the region by the various stakeholders (i.e. the tour operators, the customer participants and DFO Marine Mammal Advisor) and an indication of operator solidarity during tours. These findings suggest that the operators are generally responsible in terms of their interaction with the wildlife during tours. On the other hand, 13.9 per cent of the whale-watching customers indicated that they witnessed vessel conduct that raised concerns about the welfare of the target species and there were several comments made by the operators which were indicative of consistent operator non-compliance with the current voluntary management programs. Given the relatively small number of marine tour operations in the region at the time of data collection (i.e. 11), the juxtaposition of these results suggests that management challenges persist even in small whale-watching communities.

This implication in the data is consistent with the findings reported by Bejder et al. (2006b), who examined the long-term effects of dolphin-watching on bottlenose dolphins (*Tursiops* sp.) in Shark Bay, Australia. The researchers compared the abundance of dolphins within adjacent 36 km tourism and control sites over three consecutive 4.5 year time periods, during which the number of dolphin-watching vessels increased from zero to one to two tour operators (thus there were three distinct time periods during the study: a time prior to dolphin tourism, a time with one operator and one with two operators). Their results revealed that there was no difference in dolphin abundance between periods with no tourism and periods with only one operator.

However, as the number of operators increased to two, there was a significant average decline in dolphin abundance (i.e. a decline of one per seven dolphins). Within the control site, there was an increase, though statistically non-significant, in dolphin abundance. These results demonstrate that even low levels of wildlife viewing activity (i.e. only two tour businesses) may impact the focal wildlife. Extrapolating from these findings, it appears that the need for management may be even more urgent in areas with greater numbers of tour vessels, where there is a higher frequency of vessel-whale interactions (e.g. British Columbia, where there are 47 commercial whale-watching tour operators, or in Quebec, where there are 75 (Hoyt, 2001)). Indeed, the intensity of tourism pressure on the cetaceans in a given area may define the need for management intervention.

2. Second, the data support Lien's (2001, p.13) conclusion that: "it is a matter of some urgency that the DFO formulate and initiate plans to manage whale watching activities in Canada." Doubts expressed by several of the operators about the necessity of two voluntary management programs (i.e. the Bay of Fundy Whale Watchers Code of Ethics and the DFO Whale-watching Guidelines) and operator concerns about the lack of adherence and enforceability of the Code of Ethics in particular suggest the need for an official, single set of management regulations that are legally enforceable. This has already been acknowledged by the DFO; the findings of this research add further weight to the decision to include wildlife viewing activities as part of the *MMR*.

However, enforcing the upcoming marine wildlife viewing regulations will undoubtedly be difficult. Firstly, a DFO enforcement official will not be present on each vessel at all times to ensure proper adherence to the regulations. Moreover, given the

indication that reports of poor vessel conduct are usually received by the DFO as "third and fourth hand" accounts because eye witnesses "don't want to get involved," it appears that gathering enough credible evidence for charges in the event that a violation occurs may be complicated (Lien, 2001; J. Conway, personal communication, April 20, 2007). In light of these difficulties, it is suggested that to encourage operator compliance with the upcoming regulations, the emphasis should be placed on building collaborative relationships with the operators rather than enforcement through reactive, punitive actions. This recommendation is consistent with Lien (2001) and with the findings from related studies on the management of wildlife-based tourism (e.g. Sirakaya and Uysal, 1997; Orams, 2000). For example, in a study examining the factors that influence compliance with ecotourism guidelines, Sirakaya and Uysal (1997, p. 330) found that the conformance behaviours of nature-based tour operators from the U.S., Canada, and Ecuador were explained by "positive reinforcers," such as educating the operators about the necessity of the management guidelines and about the expectations with respect to proper conduct. Deterrence factors (e.g. sanctions and enforcement), on the other hand, were not significant in explaining the adherence of the operators to management guidelines.

Applying the findings reported by Sirakaya and Uysal (1997) to the present study, it appears that establishing an open dialogue between DFO officials and tour operators would likely strengthen operator adherence to and support for the regulations. There is evidence that the local fisheries offices have consulted the operators on an individual basis but no formal gathering of the operators in the region has yet occurred, unlike in the Pacific Coast of Canada. Conducting a formal meeting with the operators and

maintaining a dialogue with them may not only encourage compliance behaviour, but it will also allow the DFO to gain insights from the operators and potentially incorporate their recommendations into any regionally-specific regulations that may be stipulated in the *MMR* amendments. This would also ease the doubts expressed by some of the operators about the sincerity of the DFO's efforts to manage the whale-watching industry.

3. The need to licence and limit the number of tour vessels was generally well-accepted and endorsed by many of the operators. This implies that issuing "Marine Mammal Watching Licences," as proposed in the draft version of the *MMR* revisions (DFO, 2005), would generally be welcomed by the operators. Although various conditions for the Licence are being proposed (e.g. the location of viewing activities, the manner of approach, the type, size and number of vessels to be used), there is no clear indication that the duration of the tours specifically will be regulated. However, given the strong indication from several of the operators that trip times have a significant impact on the vessel-wildlife interaction and on the pressure placed on the operators to locate and view whales, it appears that the duration of the tours is a management issue that should be considered in the upcoming *MMR* amendments.

With respect to the conduct of the whale-watching vessels in the region, the results suggest that vessel proximity to the whales, and vessels following and chasing whales are the most important management issues. Such practices should be prohibited in the final draft of the *MMR* revisions. These findings also suggest that there is a need to improve the operators' estimation of distances to whales during viewing, particularly since all the operators currently base their estimations on visual and auditory cues and not

with the aid of instruments that may provide more accurate distance measures. The difficulties in estimating distances on water and its effects on operator compliance with management guidelines have been noted by other researchers (e.g. Whitt and Read, 2006). For this present study, Baird and Burkhart's (2000) suggestion of incorporating tools such as range finders in management efforts seems to be a prudent recommendation for the tour operations in the lower Bay of Fundy region.

4. Fourth, the findings suggest that there is a need to raise the level of public awareness of whale-watching management guidelines in the region. This adds weight to Lien's (2001) recommendation to the DFO that whale-watching management in Canada should be paired with a public education program. Findings from the customer questionnaires indicate that the tour businesses themselves are the most common source from which the customers become aware of management practices but that the level of knowledge about specific guidelines is rather superficial. One way of addressing this issue is for operators to outline the specific stipulations of the management guidelines (e.g. approach distance standards) and the need to follow them in their pre-tour briefing to the customers. The desire to satisfy the customers' expectations has been posited as a potential contributor to operator non-compliance with management guidelines (Whitt and Read, 2006). Informing the customers about specific management rules prior to the tour so that they do not expect unrealistic interactions with the wildlife during the tour may also be effective in managing passenger expectations (Whitt and Read, 2006). This corresponds with Forestell and Kaufman's (1993, p. 24, as cited by Orams, 2000, p. 568) observation that "it is probably a misnomer to talk about management of whales. It is not the whales that need to be managed but the humans that hang out with them."

6.3 The implications of the research findings for the environmental sustainability of the commercial whale-watching industry in the lower Bay of Fundy, New Brunswick

6.3.1 Monitoring of cetacean populations

To ascertain the behavioural and biological impact of wildlife viewing and other industries on marine mammals, it is essential to gather long-term information on the status of the focal wildlife populations (Woods-Ballard et al., 2003). As noted by Duffus and Dearden (1990), the priority for managing the recreational use of wildlife is often to develop a baseline of information to understand the relationship between the focal organism(s) and the particular tourism site. This would help establish behavioural and reproduction standards by which managers will be able to recognize when the species is being disturbed and if disturbance has potential to adversely affect the individual or population. Critical baseline information to collect include: population size, habitat use, home range and behavioural ecology (Constantine, 1999, as cited by Woods-Ballard et al., 2003). Such information will ultimately be beneficial in informing and adaptively amending management programs (Woods-Ballard et al., 2003). Evidence from the literature (e.g. Williams et al., 2002) indicates that in order for wildlife viewing regulations to be effective, the regulations themselves should be based on sound scientific data on the target species. This is particularly important when management initiatives are being implemented or revised (Woods-Ballard et al., 2003), as is the present situation in Canada.

Several researchers have recommended that whale-watching tour operators can be useful in providing long-term monitoring of cetacean populations given their accessibility to the animals (e.g. Lien, 2001; Woods-Ballard et al., 2003). Notable amongst these is

Swartz (1999, as cited by Woods-Ballard, 2000), who compiled a list of recommendations for how the whale-watching industry can aid in monitoring and assessing the health of cetacean populations (Table 6.1). In fact, studies such as the one carried out by Ingram et al. (2007) demonstrate the utility of using whale-watching tours to gather information for scientific research.

Table 6.1 Recommendations for long-term study of cetacean populations from whale-watching vessels (from Woods-Ballard, 2000, p. 25 adapted from Swartz, 1999)

Measurement	Results
Whale watching effort (e.g. number and seasonality of whale watching trips).	Assessment of numbers of cetaceans encountered per unit effort, which can be examined over time.
Seasonality of presence of cetaceans in the whale watching area.	Assessment of timing of cetacean migrations and ranges to detect changes.
Measurement of the specific areas and habitats used by cetaceans.	Assessment of changes in habitat use patterns of cetaceans.
Measurement of reproductive success of individual cetaceans that are exposed to whale watching activities (e.g. calving rates and success of recruitment of offspring).	Production of guidelines and advice on specific activities that pose a direct threat to cetacean populations.
Collection of evidence of physical injury or disease that could have resulted from exposure of whale watching activities	Production of guidelines and advice on specific activities that pose a direct threat to cetacean populations.

In this study, however, only four of the tour operators interviewed indicated that they regularly record their encounters with whales and the other marine wildlife. This is less than half of the operators in the lower Bay of Fundy, New Brunswick region. This finding suggests that there is room for improvement in terms of encouraging the operators to monitor the whale populations they target. This can be accomplished by including a monitoring program as a condition of the "Marine Mammal Watching Licence" currently being proposed.

6.3.2 Environmental sustainability

Given that specific ecological parameters (e.g. the numbers and distributions of whales) central to the environmental sustainability of the whale-watching industry in the region were not quantitatively assessed, there is a certain level of caution that must be applied to the interpretation of the findings. Several implications, however, can still be drawn from the present data.

To begin with, responses from the tour operators, in conjunction with the findings from the literature, suggest that the Bay of Fundy region has experienced significant historical changes in its ecosystem and may still be experiencing a period of ecological changes (e.g. a warming trend in the surface water temperature (Table 5.9)). These changes may be affecting the foraging sites and number of finback whales encountered in the region, as cited by many of the operators. One of the most important findings of this study is that there is a need for long-term research on the distributions of finback whales in the lower Bay of Fundy and Gulf of Maine region. Given that the Atlantic population of finbacks is currently listed as "special concern" under the *SARA*, it may be particularly important to assess the population abundance and distribution of these whales. Moreover, there is a need to assess whether the environmental changes that are being documented in the region are affecting the whales and their feed stocks. These assessments must be on a wider regional scale (i.e. beyond the Bay of Fundy itself), given the shared ecosystem between of the Bay of Fundy, the Scotian Shelf and the Gulf of Maine (Figure 2.5a). The need for regional environmental monitoring and management efforts was evident in several of the operators' comments which suggested that fishing practices in the Gulf of Maine affect the abundance of commercially important fish stocks (e.g. herring) in the

Bay of Fundy as well. An encouraging sign is that there are indeed numerous regional habitat monitoring, mapping and conservation efforts underway for the Bay of Fundy, Gulf of Maine and Scotian Shelf area (Tyrrell, 2005, chap. 1) (Table A6, Appendix C).

Ultimately, the findings of this present study indicate that the continued ecological viability of the whale-watching industry in the lower Bay of Fundy is uncertain. The future of the industry is clearly dependent on the continued migrations of the whales into the coastal waters of the Bay for foraging and feeding. This, in turn, is dependent on human activities in the region (e.g. the siting of the LNG terminals in Maine), and on the human response to regional environmental changes that may potentially affect the occurrence of whales in the region.

6.4 Implications of the research findings for the economic sustainability of the commercial whale-watching industry in the lower Bay of Fundy, New Brunswick

The results indicate that the lower Bay of Fundy region has, to some extent, developed into a whale-watching area. Indeed, the vast majority of the customers were aware that whale-watching opportunities existed in the region before their arrival and nearly half of the customers indicated that whale watching was the primary purpose of their visit to the area. The positive economic impacts of the whale-watching industry for the region can be implied from these findings. The sustainability of the industry is therefore important to the region's tourism sector.

Regarding the economic sustainability of the commercial whale-watching industry in the lower Bay of Fundy, there is a dichotomy in the implications of the findings. From one perspective, the results suggest a highly sustainable whale-watching industry. This is backed by the high level of customer satisfaction, the diversity in the

tours offered by the operators, the variety in vessel styles and in the local area attractions which bring added value to the tours, and the positive comments made by the majority of the operators about the success of their competitors in the region.

On the other hand, it appears that the economic sustainability of the industry is somewhat fragile or "precarious," as one operator put it. This implication is drawn from several particular findings, most notable of which was the general sense of hesitancy from the tour operators regarding the future economic health of the industry. Indeed, several of the operators perceived that their business/the industry as a whole were not thriving. This was reflected by the fact that the majority of the operators (N= 7) have supplemental sources of income. This vulnerability seems more pronounced on Deer Island and Campobello Island. Indeed, the overall implication of the findings is that the businesses on the two islands are generally less developed and market ready than their counterparts in St. Andrews and Grand Manan Island. Moreover, comments about the weaker tourist base on Deer and Campobello islands and the inconsistency in the customer flow to the tour businesses during data collection suggest that the sustainability of the industry in these areas in particular seems to be fairly questionable. Business support and advice programs, however, are available at the local level for small business enterprises, like whale-watching companies. For example, the business development agency, Enterprise Charlotte, based in St. Andrews, provides funding to establish small businesses (e.g. The Seed Connection Program) and can also offer advice and referrals to struggling businesses (M. Rouse, personal communication, August 13, 2007). The tour operators on Deer and Campobello islands can tap into such resources.

There is a strong indication from the data that increasing the number of operators in the region should be discouraged, from both an economic and an ecological perspective. This is particularly applicable to St. Andrews, where there were six operators at the time of data collection. This observation is consistent with a recent publication released by New Brunswick's Department of Tourism and Parks. The publication assesses tourism development across the province and concludes that the whale-watching market in the Bay of Fundy is "saturated," such that existing operators may consider upgrades only, not expansion (New Brunswick Department of Tourism and Parks, 2004a, p. 11).

The true potential for growth in the industry lies in improved marketing. As suggested by several of the operators, a consolidated marketing strategy, where the tour operators themselves market the whale-watching businesses in the region as a whole, may be necessary. This suggestion is consistent with recommendations made by Weaver et al. (1996) for private ecotourism providers in Manitoba and by Warburton et al. (2001) to raise the profile of the whale-watching industry in Scotland.

A regional marketing plan, where operators advertise with one another as opposed to against one another, may be particularly helpful in improving the market development status of the younger tour businesses, which appear to be at a competitive disadvantage, and the businesses on Deer and Campobello islands. Such an effort may also be necessary to raise the international profile of the whale-watching industry in the region. Given that overseas travelers made up less than 5 per cent of the customers surveyed, there is significant room for improvement in this sector.

Several recommendations emerge from the data with respect to establishing and promoting a consolidated marketing effort between the whale-watching operators in the lower Bay of Fundy region:

1. Establish one website for all the operators.

Given that the majority of the operators already advertise on the internet, establishing one 'Bay of Fundy Whale Watching' portal site which links all the operators' websites can be part of the consolidated marketing strategy. This was also recommended by Woods-Ballard et al. (2003) in their assessment of the whale-watching industry in Scotland. Moreover, resuming the West Isles Whale-watchers Association is recommended as a way of uniting the operators in the lower Bay of Fundy and improving efforts to promote a cooperative marketing plan.

2. Promote diversity.

The diversity in the tours offered by many of the operators (e.g. bird watching, scenic tours, sunset cruises), and in local area wildlife (e.g. porpoises, seals, marine birds) and attractions (e.g. fishing weirs, lighthouses) should be promoted in the marketing effort. Furthermore, the variety of whale-watching vessels in the region (i.e. sailboat, zodiac, catamaran, open motor boat, partially enclosed motor boat) should also be advertised. This diversity ultimately bodes well for the success of the whale-watching industry because it provides the customers with a number of choices that can cater to their particular preferences. The variety in the styles of the whale-watching vessels also means that the region as a whole can offer different tour experiences, and that new experiences are available for repeat whale-watching customers.

3. Appeal to different markets.

The diversity in the vessels used for whale watching can also be used to cater to various niche markets. For example, the small vessels (e.g. zodiacs) can provide more intimate experiences while large vessels can accommodate for larger groups.

4. Advertise in specialty magazines.

Given that approximately one quarter of the whale-watching customers indicated that they were members of an environmental or wildlife conservation organization and that nearly one third of the customers had given financial support to such an organization within the past year, it is recommended that the tour operators advertise in specialty magazines or websites dedicated to such causes to help draw an audience that would be highly interested in participating in whale-watching activities.

5. Market the industry responsibly.

The need to promote the whale-watching businesses should not usurp the need to market the industry responsibly. Indeed, a fine balance must be found. One of the tour operators in particular felt that the present marketing of the industry was leading to heightened customer expectations, particularly their expectations to see humpback whales. It is recommended here that if in fact a consolidated marketing initiative is undertaken, a reliance on dramatic whale-watching advertisements to draw customers should be discouraged, particularly given the indication from the data that advertising in general is not a major factor to the customers' decision to go whale watching. Responsible marketing should also involve effective communication of management practices to the customers through websites, brochures, signs and other forms of advertising (Hudson and Miller, 2005).

6.5 Implications of the research findings regarding the strength and vulnerability of the commercial whale-watching industry in the lower Bay of Fundy region

The sustainable whale-watching model introduced in Chapter 2 has been successful in highlighting the strength and vulnerability of the commercial whale-watching industry in the lower Bay of Fundy region. The strengths of the industry are several: 1. the indication of operator cooperation and teamwork during viewing; 2. the indication that operators are fairly responsible in terms of their interaction with the wildlife; 3. the consistency of the whale encounters; 4. the high level of customer satisfaction and the indication that their expectations are being met; 5. the tourist appeal of the region as a draw for customers, particularly St. Andrews; and 6. the diversity in the tours offered by the operators and in local area attractions and wildlife. These factors positively reinforce the marine tourism industry in the lower Bay of Fundy region and are thereby termed as agents of strength for the sustainability of the industry.

The above elements, however, are juxtaposed by several other findings, such as: 1. the need to improve whale-watching management and operator compliance with and involvement in regulatory measures; 2. the apparent spatial shift in finback whale foraging activity (a topic that requires further research); 3. the on-ground competition between the operators that seems to be putting some of the businesses at a particular disadvantage; 4. the present downturn in tourist visitation; 5. the need for an improved regional marketing strategy; and 6. the somewhat fragile economic profile of the industry particularly on Deer Island and Campobello Island. These factors are defined as agents of vulnerability, areas within the industry that contribute to or are indicators of a non-sustainable whale-watching tourism system.

Taken as a whole, the implication of the findings with respect to the overall sustainability of commercial whale-watching activities in the lower Bay of Fundy region reveals the wisdom in one of the tour operators' assessment of the industry. That is, the results indicate that at the moment, the industry is "sustainable, but just on the edge."

6.6 Limitations of the research and recommendations for future research

The most notable limitation to the present research is that the assessment of the sustainability of the whale-watching industry is primarily based on the perspectives of the tour operators and whale-watching customer participants. Indeed, there were no field observations of key variables such as the conduct of the tour vessels and operator compliance with management guidelines during tours. Such observations would have undoubtedly strengthened the validity of the conclusions reached. In future related research, it is recommended that the qualitative research approach adopted by the present study should be paired with field measurements of vessel conduct and the impacts of whale-watching activities on the target species. This would give a more accurate assessment of the sustainability of the industry.

Another key limitation of this study is its omission of a focal discussion on factors related to the "social desirability" of the whale-watching industry. Indeed, while management, environmental and economic dimensions of the industry were investigated, social issues (e.g. the attitudes of the local residents towards whale-watching tourism), which are also fundamental to sustainability, were not specifically explored. This is largely due to the fact that the perceptions of one key group of stakeholders, the local politicians, business owners and inhabitants, were not incorporated into the study (primarily because of resource and time constraints on the research). The receptivity of

this group to whale-watching tourism in their communities, however, is vital to the successful establishment and support for cetacean-based tourism. This has been demonstrated in the literature (e.g. Ris, 1993; Young, 1999). In future related studies, it is highly recommended that the perspectives of these stakeholders be included to give a more complete assessment of the sustainability of the whale-watching industry.

Another oversight in this research is related to the customer questionnaires. The questionnaires could have elicited certain types of information from the passengers to give a more accurate and quantitative description of the direct and indirect economic impact of commercial whale-watching activities specifically in the lower Bay of Fundy region. This would have been particularly helpful since such data are not directly recorded by New Brunwick's Department of Tourism and Parks. Gathering information such as the number of extra nights spent as a result of a whale-watching trip in the region, the average daily expenditure and the type of accommodations (e.g. hotel, friends/family, campground) in which the tourists stayed during their visit to the region could have been used to ascertain the economic value of the industry. This was done by Warburton et al. (2001), who elicited such data from whale watchers in West Scotland and used the information to determine the impact of the whale-watching tourism in the region.

One more notable limitation of this study is that it was conducted during a one-month time period and focused on whale-watching businesses in St. Andrews and the Fundy Isles alone. This temporal and spatial limitation means that the present findings are only a snapshot of the overall marine tourism industry in Atlantic Canada. Consequently, this limits the suitability and applicability of the results to other whale-watching regions outside the lower Bay of Fundy. Indeed, to provide a more comprehensive depiction of

the whale-watching industry on the Eastern Coast of Canada, a wider regional focus, based on data gathered from multiple whale-watching seasons, is necessary.

6.7 Chapter conclusion: The utility of the research framework at assessing the sustainability of commercial whale-watching tourism

The utility of the research framework at assessing the sustainability of commercial whale-watching tourism lies in its focus on variables that may enhance or inhibit sustainability. By using the model, a wide range of issues central to achieving and maintaining sustainability in the whale-watching industry can be discussed and their effects on the industry can be ascertained. Moreover, the framework can be applied to whale-watching industries in other regions of Canada or the world, given the universality of the themes covered.

However, it must be reiterated that the research model does not encompass the full range of issues important to the whale-watching industry. Indeed, there are a number of other factors that affect the marine tourism industry that are not specifically included in the framework (e.g. the effects of weather conditions on the tour businesses). In addition, since the framework was developed based on the cetacean viewing industry, the suitability of the model for other forms of human interaction with cetaceans (e.g. the "swim with whales" tourism industry) may be limited. Indeed, further research is needed to assess the value of the model in evaluating the sustainability of other non-consumptive wildlife use industries.

Nonetheless, the research framework has been useful in highlighting a number of variables within the commercial whale-watching industry in the lower Bay of Fundy region that are in need of operator and management attention. The framework has also

revealed areas where operators and managers can build on the present strengths of the industry. It is important to note, however, that the factors presently identified as agents of strength and vulnerability are themselves variable and subject to the fluctuations in the tourism industry and the natural ecosystem. Consequently, those factors that may be strengthening the viability of the whale-watching industry in the study region at the moment may become inhibitory with time, and vice versa. Indeed, as noted by Farrell and Twining-Ward (2005, p. 119):

> it bears repeating that ... the varying temporal and spatial scales involved in the interaction of subsystems within tourism systems, and the evolving aspirations and values of local people and their representative stakeholders involved in co-management, together with the probability of surprise from within or outside the system, will always prevent the uniform achievement of permanence.

The important message to be taken from this research is that for any tourism system in any given area, there is a network of factors that continuously influence the system as a whole. These factors, particularly those that inhibit the viability of the system, must be identified, addressed and monitored to ensure a more effective transition towards sustainability.

APPENDIX A

Table A1. Specific information on the four focal species of the whale-watching fleet in the lower Bay of Fundy, New Brunswick (the information below is primarily derived from the North-eastern Fisheries Science Centre (NEFSC) (a branch of the National Marine Fisheries Service in the U.S.), unless otherwise noted (NEFSC, 1997; 2003a; 2003b)

Humpback whales Humpbacks are found in both the Atlantic and the Pacific Oceans (Lien, 2001). The humpbacks that frequent the Bay of Fundy are considered to part of the Western North Atlantic stock, of which there are at least five geographically distinct feeding aggregations during the summer. The number of humpbacks in the North Atlantic Ocean west of Iceland from 1979-1990 has been estimated to be 5, 543 individuals. Current data suggests that the North Atlantic population is increasing in size (an average of 3.1 per cent for the period 1979-1993). Humpbacks are vulnerable to entanglement in fishing gear; there were 74 confirmed entanglements for this population between 2000 and 2004; eight of these resulted in death (Cole et al., 2006). This population is currently not listed under the *Species At Risk Act (SARA)* in Canada.
Finback whales Finback whales in the lower Bay of Fundy region are believed to be part of one stock: the Western North Atlantic stock. It is estimated that there are 2, 814 individuals to this stock (based on ship and airplane surveys from July 28 to August 31, 1999). This population is listed as "special concern" under the *SARA* (Appendix A, Table 2.). This listing denotes that the population "may become threatened or endangered because of a combination of biological characteristics and identified threats" (Department of Justice

Canada, 2007b, section 2).

Minke whales

Minke whales are found in all oceanic temperature zones (i.e. polar, temperate and tropical waters). The North Atlantic stock of minke whales has been identified as having four main populations, one of which is the Canadian East Coast population. The total number of individuals in this population is unknown but estimates of minke whale abundance in the northern Gulf of Maine to the lower Bay of Fundy region during the summers 1991 to 1992 indicate that there are 2, 650 individuals. Minke whales are subject to entanglements in fishing fear, fish trap, lobster gear, gillnets and weirs. Data on minke whale interactions with fishing gear, however, is not well recorded in Canada. This population is currently not listed under the *SARA.*

Right whales

These whales are the most vulnerable and well-researched species in the lower Bay of Fundy. Entanglements in fishing gear and ship strikes are arguably the most critical human-induced threats to the North Atlantic right whales, which range from Florida to the Canadian Maritimes (Vanderlaan et al., 2003; Kraus et al., 2005). Their summer and autumn feeding habitat in The Grand Manan Basin (in the lower Bay of Fundy between Grand Manan Island and Nova Scotia) overlaps with an internationally designated shipping lane (Vanderlaan et al., 2003). Cole et al., (2006) (on behalf of the NEFSC) reported that of the 20 confirmed cases of North Atlantic right whale mortalities between 2000 to 2004, nearly half (9/20) were attributable to entanglements or ship strikes. This population is currently listed as "endangered" under the *SARA* (Appendix A,

Table 2.). This means that the population faces "imminent extirpation or extinction"

(Department of Justice Canada, 2007b, section 2).

Table A2. Whale populations in Canada listed as extirpated, endangered, threatened, and of special concern under Schedules 1-3 of the *Species at Risk Act* as of August, 2007 (modified from *SARA,* Department of Justice Canada, 2007b)

	Schedule 1	Schedule 2	Schedule 3
Extirpated "no longer exists in the wild in Canada but exits elsewhere in the wild"	- Whale, Grey (*Eschrichtius robustus*); Atlantic population	----------	----------
Endangered " species facing imminent extirpation or extinction"	- **Whale, North Atlantic Right (*Eubalaena glacialis*)*** - Whale, North Pacific Right *(Eubalaena japomica)* - Whale, Killer (*Orcinus orca*); Northeast Pacific southern resident population - Whale, Blue *(Balaenoptera musculus)*; Atlantic population; Pacific population - Whale, Sei *(Balaenoptera borealis)*; Pacific population - Whale, Northern Bottlenose *(Hyperoodon ampullatus)*; Scotian Shelf population	- Whale, Bowhead (*Balaena mysticetus*); Eastern Arctic population; Bering-Chukchi-Beaufort population	----------
Threatened " wildlife that is likely to become endangered if nothing is done	- Whale, Killer (*Orcinus orca*); Northeast Pacific northern resident population; Northeast Pacific transient population	----------	----------

to reverse factors leading to its extirpation or extinction"	- Whale, Beluga *(Delphinapterus leucas)*; St. Lawrence Estuary population - Whale, Fin *(Balaenoptera physalius)*; Pacific population - Whale, humpback *(Megaptera novaeangliae)*; North Pacific population		
Special Concern " species that may become threatened or endangered because of a combination of biological characteristics and identified threats"	- Whale, Killer (*Orcinus orca*); Northeast Pacific offshore Population - Whale, Gray (*Eschrichtius robustus*); Eastern North Pacific population - **Whale, Fin *(Balaenoptera physalus)*; Atlantic population***	----------	- Whale, Fin (*Balaenoptera physalus*) - Whale, Sowerby's Beaked (*Mesoplodon bidens*)

* this population is a target species of the commercial whale-watching vessels in the lower Bay of Fundy

Table A3. Boat-based whale-watching guidelines from the Department of Fisheries and Oceans Canada (modified from Carlson, 2007, p. 27-28)

General Rules	1. Do not hunt, chase, follow, disperse, drive or herd pods or individual whales. 2. Do not disturb whales for example while they are resting, feeding and traveling.
General Guidelines for Whale Watching	1. If one or several whales are sighted in the vicinity of your vessel, avoid any sudden speed or course changes. 2. If you are less than 300 metres (1,000 feet) from an animal, reduce speed and advance slowly, using an oblique line of approach. 3. Avoid heading directly toward the whale.

	4. Do not go closer than 100 metres (300 feet) of a whale dolphin or porpoise. The animal may choose to come much closer to you; if it does, do not chase it and be wary of any individual that appears to be tame. Keep clear of the flukes. 5. When you are at a distance of 100 metres (300 feet), shift your motor into neutral or idle. If you must use your motor to hold your position, keep your speed down. If you have a sailboat with an auxiliary motor, leave it in idle to signal your presence or turn on your echo sounder. 6. When leaving the location, start out slowly and wait until you are 300 metres (1,000 feet) from the animal before accelerating. 7. Travel parallel to whales: even if whale-watching is not the primary purpose of your excursion, be on the lookout to avoid collisions, especially in waters where whales have been sighted or reported. If it is impossible to detour around a whale or a pod of whales, slow down immediately and wait until you are more than 300 metres (1,000 feet) away before resuming speed.

Table A4. Bay of Fundy Whale Watchers Code of Ethics (modified from Grand Manan Whale and Seabird Research Station, 2006, http://www.gmwsrs.org/watch.htm#Code)

- The first vessel to locate a whale or group of whales will have first viewing priority. The vessel is under no obligation to announce the location of the whales to other operators.
- No more than two vessels will view a whale or group of whales at a time within 100m of the whale or group. If the whales are travelling, the viewing vessels will maintain a respectable distance to avoid herding the animals.
- A maximum of 30 minutes will be spent viewing a whale or group of whales if more than two vessels are in the immediate vicinity. Passengers will be informed that we are moving off to allow other vessels to view the whale and that we must avoid crowding the animals and endangering their safety. Motorised vessels will also take care not to crowd or endanger the safety of kayakers.
- Any whale showing avoidance behaviour such as turning away or increasing speed will be left alone.
- All operators will stand-by on a designated VHF radio channel for purposes of communication when one vessel is viewing or waiting to view a more than whale or group of whales, and we will co-ordinate the selection of the channel with whale watch vessels from other areas in the Bay of Fundy.
- Vessels approaching another vessel already engaged in whale watching will contact that vessel and arrange viewing priority.
- A fair distance will be kept when waiting to view so as not to crowd the whale or

viewing vessels. While waiting tour operators will engage in other activities such as sea bird and seal viewing, or conservation education.

- When vessels are stopping to listen for whale blows in the fog, as a courtesy other vessels in the immediate vicinity will do the same.
- Vessels will cover different areas as much as possible so that not all vessels will be converging on the same location.
- In the vicinity of fixed fishing gear whales will not be herded in the direction of the gear.

Table A5. Summary of the key features of the draft revisions to the *Marine Mammal Regulations (MMR)* (*modified from DFO, 2005, p. 3-12*)

- **Licences**
  - DFO to issue: Marine Mammal Watching, Marine Mammal Research and Marine Mammal Disturbance Licences
  - a commercial marine wildlife viewing vessel must be licensed under the *Regulations*

- **General prohibitions**
  - Prohibiting the disturbance of a marine mammal's life processes
  - Prohibiting an approach of closer than 100m to a cetacean or walrus; this can be changed by a Fisheries officer under certain circumstances, if it is necessary to protect the animals or human health

- **Regional prohibitions**
  - The amendments would allow for various coastal regions in Canada to establish their own specific regulations to reflect the differences in the local geography, kinds of activities of concern and species needs

- **Conditions of the Marine Mammal Watching Licence**
  - the areas in which marine mammal viewing may take place
  - the species which are allowed to be viewed
  - when marine mammal viewing can take place
  - the type, size and number of vehicles that can be used to view marine mammals
  - the vehicle that can be used and the persons who are allowed to operate it
  - the marking and identification of the vehicle allowed to be used
  - the manner in which the vehicle can be operated: e.g. the proximity to the marine mammals, the speed, direction and manner of approach to marine mammals
  - information to the reported to the DFO, including records of activity carried out under the licence

APPENDIX B

Tour Operator Interview Guide

Let's begin by talking about your own whale-watching business.

1. How did you get into the commercial whale-watching business?

Points to be covered: Company history and details:

a.) When did you start your business?

b.) How long have you been in the commercial whale-watching business?

c.) What did you do before running whale-watching tours?

d.) Why did you begin a commercial whale-watching tour business?

e.) How did you assess the business opportunity/potential for your tour business?

f.) In which months do your whale-watching season start and end?

g.) How large is your business? (e.g. how many full-time and/or part-time staff do you employ?)

h.) Did you have to obtain any licenses or certificates in order to open your business?
- If yes, can you please briefly describe the requirements of the licenses or certificates?
- What do you think has been the impact of the licensing or certificate process on the way you run your whale-watching tours?

i.) Do you have any training in wildlife-based tourism and/or business management?
- If yes, can you please give a quick description of the training requirements and length of training?
- What do you think has been the impact of this training on the way you run your whale-watching tours?

2. Let's now talk about your whale-watching vessel itself.

Points to be covered: Vessel Details and Repairs:

a.) What is the name of your whale-watching vessel?

b.) How big is your vessel?

c.) How many passengers can it take?

d.) How old is your vessel?

e.) How often do you do maintenance or repair work on your vessel?

f.) Do you usually have to stop running tours during maintenance or repair work?
- If so, for how long do you usually have to stop running tours?

g.) Have you done any kind of maintenance or repair work on your vessel recently, as in within the past year?
- If so, what kind of work have you done on your vessel recently?
- What prompted you to do these repairs?

Let's now talk about a typical day out whale watching.

3. What is a typical whale-watching tour like?

Points to be covered: Typical whale-watching tour:

a.) How long is a typical tour?

b.) How many times a day to you run tours?

c.) Do you run the same number of tours throughout the entire season?

d.) Do you spend the same amount of time on a typical tour throughout the entire season, or are there changes in the length of a tour during the season?

e.) Which areas do you tend to take your customers to see whales and other marine life during a tour?

f.) Since you've been running tours, have these areas always been good spots to see whales?
- If no, how do you find new areas for whale watching when the areas where you use to see whales are no longer as good?

g.) During a tour, how do you usually locate whales? (e.g. what tools or equipment do you use to locate whales?)

h.) How do you estimate the distance to whales during a tour? (e.g. what tools or equipment do you use to measure distances?)

i.) How close to you get to the whales?

j.) Do you ever encounter situations where your vessel is especially to a whale (by especially close, I mean closer than you usually approach the whales)?
   - If so, in what kinds of situations would you get especially close to a whale?
   - How often do these situations occur?
   - What is your response in these situations? What do you usually do with your vessel? (e.g. Do you pull away? Do you remain still?)
   - What is the response of the customers in such situations where the vessel gets especially close to a whale?

k.) How do you usually locate other marine life?

l.) Do you record the sightings of whales or other marine life?
   - If so, what do you do with the recordings?

m.) Which 3 whale species do you see the most?
   - How often do you see each species on average (e.g. every trip? every other trip? every third trip? etc.)
   - Are there any changes in how often you see these 3 whales during the season?

Thank you for your answers to the questions so far. Let's now change the focus a bit and talk about different aspects of the whale-watching industry that tend to change from time to time.

4. Let's begin by talking about the customers.

Points to be covered: Customer numbers:

a.) Can you please describe any trends you've noted in the number of customers on your tours over the years? (e.g. over the years, is the number of customers on your tours increasing, decreasing or about the same?)
   - If increasing or decreasing, why do you think the number of customers is growing or declining?
   - If increasing or decreasing, what has been your response to the growing or declining number of customers? (e.g. if the number of customers has been going down, have you scaled back your business? If the number has been increasing, have you added more staff?)

b.) Over the years, have you noted any trends in the number of customers coming for commercial whale-watching tours in the Bay of Fundy region has a whole? (In your opinion, is the total number of customers in the Bay of Fundy region increasing, decreasing or about the same?)
   - If increasing or decreasing, why do you think the total number of customers have been growing or declining in the Bay of Fundy region as a whole?

- If increasing or decreasing, what, if any, has been the response in the community to the growing or declining number of whale-watching customers in the region?

Points to be covered: Customer expectations and behaviour:

c.) Tell me what you think the customers expect when they come for a whale-watching tour.

d.) How do you accommodate the customers' expectations (as in, what do you do to ensure that the tours meet the customers' expectations?)

e.) Do the customers behave well during a tour?

f.) Are there any problems with customer behaviour in terms of their interaction with the marine wildlife? (e.g. throwing food overboard and other things of that nature?)
   - If so, what do you do when customers are behaving poorly? How do you respond?

g.) If few/no whales are seen, what else do you offer to the customers during a tour?

h.) In general, what is the response of the customers after a tour if few/no whales have been seen?

i.) What is the customer response when a lot of whales have been seen?

j.) Overall, do you think the tour experience meets the customers' expectations?
   - If no, what do you think can be done, in terms of your own business or the other tour businesses in the area, to make the experience meet customers' expectations?
   - If no, what have you done or thought about doing so that the tour experience can meet the customers' expectations?

Points to be covered: Whale-watching season:

k.) When are the peak and slow periods within your whale-watching season?

l.) Do you still go whale watching if there are only a few customers for a tour? Do you have a cut-off point?

m.) How do you adapt your business during slow periods? (e.g. do you reduce the number of times you go whale-watching? Do you reduce the number of staff?)

n.) How do you adapt your business during peak periods? (e.g. do you hire more staff? Do you increase the number of times a day you go whale-watching? etc.)

5. ***Let's now talk about environmental factors:***

Points to be covered: Whales:

a.) Can you please describe any trends in the *number* of whales you're sighting over the years? Is the number of whales being sighted in general increasing, decreasing or about the same?
   - If increasing or decreasing, why do you think the number of whales is increasing or decreasing?
   - If increasing or decreasing, what do you think can be done to deal with the growing or declining number of whale sightings?
   - If increasing or decreasing, what have you done in regards to your own tour business to deal with the growing or declining number of whale sightings?

b.) Staying with this topic of trends in whale sightings, have you observed any trends in the *type of species* you are encountering over the years? Are there any differences in the species you are encountering from year to year?
   - If yes, why do you think the type of species you're seeing is changing from year to year?
   - If yes, what has been the customer response to the changing type of whale species being sighted? (e.g. do the customers seem more excited/enthusiastic about seeing more _____ *{name of species mentioned by tour operator}* whales than in previous years?)

Points to be covered: Environmental Changes:

c.) What do you think is the single biggest environmental threat to the whales in the Bay of Fundy region today?

d.) Have you noted any environmental changes in the Bay of Fundy area over the years? (By environmental changes, I mean changes in water quality, in availability of food supply, in the behaviour of the whales and other wildlife, any changes to the environment due to aqua-culture activities, etc.).
   - If yes, do you feel that these changes have been good or bad for the marine wildlife in the Bay of Fundy region?
   - If yes, have these changes raised any concerns about the welfare of the marine wildlife in the Bay of Fundy? If yes, have you spoken out about your concerns? (How, when, what was the response?)
   - If yes, what do you think needs to be done in the Bay of Fundy region to address the environmental changes you just mentioned?

- If yes, what do you think realistically can be done to address these environmental changes in the region?
- In terms of your own tour business, what have you done to deal with the environmental changes that have occurred in the region over the years?

e.) From an environmental point of view, what your views on the sustainability of the commercial whale-watching industry in the Bay of Fundy region?

f.) Do you have any concerns about the environmental sustainability of the whale-watching industry in the Bay of Fundy?
- If yes, what are these concerns?
- Have you spoken out about your concerns (How, when, what was the response?)

Points to be covered: Weather:

g.) Let's now talk about how the weather affects your chances of going whale-watching: If the weather is bad, do you still run tours? (e.g. if it is particularly foggy, windy or rainy?)

h.) In terms of weather, what would stop you from going whale-watching?
- What do you offer to the customers in such a case, if the weather stops you from running a tour?

6. ***Let's now talk about your views on whale-watching management in the Bay of Fundy region.***

Points to be covered: Perceptions of vessel conduct:

a.) Tell me what you think about the conduct or behaviour of commercial whale-watching vessels in the Bay of Fundy region, in general?

b.) Do you have any concerns about the conduct of vessels in the Bay of Fundy region in terms of their interaction with the wildlife and the welfare of the wildlife?
- If yes, what are these concerns?
- What do you think needs to be done to address these concerns you have about vessel conduct in the Bay of Fundy region?
- What do you think realistically can be done to deal with the concerns you have about vessel conduct in the Bay of Fundy region?
- What have you done, in terms of your own tour business, to address the concerns you have about vessel conduct in the Bay of Fundy region?

c.) Have you ever been whale watching or had the opportunity to observe whale watching in other parts of the country or the world?
   - If yes, where have you been whale watching before?
   - How would you compare vessel conduct in this area versus the Bay of Fundy region?

Points to be covered: Awareness and perceptions of management:

d.) Do you know about the Bay of Fundy Whale-watchers Code of Ethics?

e.) Do you believe a Bay of Fundy Whale-watchers Code of Ethics is necessary? Why or why not?

f.) Do you endorse the Code of Ethics?
   - Why or why not?
   - If yes, how often do you and your staff go over the Code of Ethics?
   - If yes, do you advertise to your customers that you endorse the Code of Ethics?

g.) Do you think there are any "holes" in the Code of Ethics? (By "holes," I mean are there any problems with whale-watching conduct that the Code of Ethics does not address?)
   - If yes, have you spoken out about your views on the Code of Ethics to other tour operators? (How, when, what was the response?)

h.) Are you aware that the Department of Fisheries and Oceans (DFO) also has whale-watching guidelines?
   - If yes, do you endorse the DFO's guidelines?
   - Why or why not?

i.) Do you think the DFO's guidelines are necessary given that there is also a Bay of Fundy Whale-watchers Code of Ethics?

j.) Are you aware that the DFO is in the process of legislating whale watching?

k.) In your opinion, is there a need for legislation?
   - Why or why not?

l.) Do you think that regulating whale watching through legislation will result in any changes to how you run your business and conduct tours?

m.) What are your suggestions, if any, for improving whale-watching management, if you think improvement is necessary?

7. ***Lastly, let's talk about some of the financial aspects of running a commercial tour business.***

We'll start off with marketing and advertising:

Points to be covered: Marketing and advertising:

a.) How do you market/advertise your business? (E.g.: on the internet, tourism booklets, newspaper ads, flyers, road signs, etc.)

b.) Have you always been advertising your business in this manner?
- If no, what prompted you to begin advertising in this manner?

c.) What, if any, tourism boards or associations are you part of?
- Do you advertise through them?

d.) Do you offer any additional incentives for your customers to take your tours? (e.g. guarantees that whales will be seen? payback incentives if whales are not seen? etc.)
- If yes, what has been the response from the customers since offering these incentives (e.g. increased tourist numbers?)
- If yes, what has been the response from your competitors since offering these incentives? How do you think your competitors feel about your incentives?

Let's now talk about your competitors:

Points to be covered: Competition:

e.) From a financial point of view, how do you think your competitors are doing?

f.) Over the years, has the number of competitors been increasing, decreasing or stayed about the same?
- If increasing or decreasing, why do you think the number of other tour companies has been changing?

g.) Have you noted any trends in the nature of the competition over the years? (e.g. over the years, has the whale-watching industry in your area become more or less competitive, or about the same? I mean "competitive" in terms of competition for customers, competition for whales during the tours, competition in terms of the size and speed of the vessels, etc.)

h.) What has been the effect of competition on your particular business? (Has competition helped your business by attracting more customers to the Bay of Fundy region? Has competition hurt your business by taking away customers?)

- If the effect has been negative, how have you responded to the negative impact of competition? (e.g. have your began to offer incentives to try to draw more customers? Have you made any changes to your vessel? Etc.)
- If the effect has been positive, how have you responded to the positive impact of competition? (e.g. have you encouraged the development of more commercial tour businesses in your region?)

Let's now talk about how you got your business started, from a financial point of view:

Points to be covered: Financial Aid

i.) Is this whale-watching business your sole source of income or is it supplemental income?

j.) In starting your business, did you receive any financial aid and/or business advice?
- If so, what, in general, were the sources of financial aid?
- If so, what, in general, were the sources of business advice?

We're at the very last point in the interview now. Let's end it off by talking about your perceptions on the economic sustainability of the commercial tour business in the Bay of Fundy:

k.) What are your views on the long-term economic health of the whale-watching industry in the Bay of Fundy region?

l.) Do you have any concerns related to the economic sustainability of the commercial whale-watching industry in this region?

- If so, what are these concerns?
- Have you spoken out about them? (How, when, what was the response?)
- What do you think needs to be done to address these concerns you have about the economic sustainability of the whale-watching industry in the Bay of Fundy region?
- What do you think realistically could be done to address these concerns?

m.) Finally, what will you do if the economic outlook of the industry is not good?

Thank you for your cooperation. I would just like to know now if you have any other comments to make relating to this study. Thank you.

Pre-tour and Post-tour Whale-watching Customer Questionnaire

Eli Bamfo
MASc Candidate
Supervisor: Dr. M. Bardecki
Environmental Applied Science and Management
Ryerson University

Hello, my name is Eli Bamfo. I am a student from Ryerson University in Toronto, pursuing a Masters degree in Environmental Applied Science and Management. For my thesis research, I am conducting a study on commercial whale-watching operations in the New Brunswick Bay of Fundy region. I am currently collecting information on customer expectations, satisfaction and awareness of management practices. As part of this study, would you please answer the following questions in this survey? There are questions for you to answer on your way out for the tour (pre-tour) and on your way back from the tour (post-tour). It will take about 10-15 minutes to complete each part. Please place a mark in the appropriate boxes. Please make sure to hand in the completed survey to the researcher when you leave the boat. Thank you for your participation.

Pre-tour

1. Male ☐ Female ☐

Views on the environment and whales

2. Which of the following statements best describes your views about government spending on the conservation of wildlife and the natural environment?

Governments should spend less money on the conservation of wildlife and the natural environment than they do now ☐

Governments should spend about the same amount of money on the conservation of wildlife and the natural environment as they do now ☐

Governments should spend more money on the conservation of wildlife and the natural environment than they do now ☐

3. Are you currently a member of any organization(s) primarily concerned with the conservation of wildlife or the natural environment?

Yes ☐
No ☐

If "yes", please name the organization(s): _____

4. In the past year, have you provided any financial support, other than membership, to any organization(s) primarily concerned with the conservation of wildlife and the natural environment?

Yes ☐
No ☐

If "yes", please name the organization(s): _____

5. How well informed would you consider yourself about the current issues concerning the conservation of wildlife and the natural environment?

	1	2	3	4	5	
Not at all informed	☐	☐	☐	☐	☐	Very informed

6. Do you have any concerns regarding the welfare of whales in general?

Yes ☐
No ☐
Not sure ☐

If "yes," what is/are the main area(s) of your concern?

Oil spills ☐
Marine litter ☐
Survival of young ☐
Commercial Whaling ☐
Entanglement in fishing nets ☐
Disturbance from whale watching activities ☐
Disturbance from offshore oil activities ☐
Disturbance from military activities ☐
Reduction in available food supply ☐
Pollution ☐
Low numbers/Extinction ☐
Aboriginal Whaling ☐
Other _____

7. Do you have any concerns regarding the welfare of whales specifically in the Bay of Fundy?

Yes ☐
No ☐
Not sure ☐

If "yes," what is/are the main area(s) of your concern?

Oil spills	☐	Reduction in available food supply	☐
Marine litter	☐	Pollution	☐
Survival of young	☐	Low numbers/Extinction	☐
Commercial Whaling	☐	Aboriginal Whaling	☐
Entanglement in fishing nets	☐		
Disturbance from whale watching activities	☐		
Disturbance from offshore oil activities	☐		
Disturbance from military activities	☐		
Other _____			

8. To the best of your ability, can you please check off the locally occurring whale species among this list?

Bowhead whale	☐	Finback whale	☐
Sperm whale	☐	Grey whale	☐
Humpback whale	☐	Beluga whale	☐
Orca (Killer) whale	☐	Minke whale	☐

Previous whale-watching experience

9. Have you ever engaged in recreational whale-watching on your own (i.e. whale watching without going on a commercial marine tour)?

Yes	☐
No	☐

If "no," please skip to question 11.

If "yes," what was the nature of your previous experience during recreational whale-watching on your own?

Boat-based	☐
Land-based	☐
Both land-based and boat-based	☐
Don't remember	☐

10. Altogether, how many times have you engaged in recreational whale-watching on your own (your best estimate)?

1-3 times	☐
4-6 times	☐
7-9 times	☐
More than 10 times	☐

11. Is this your first time on a commercial whale-watching tour?

Yes ☐
No ☐

If "yes," please skip to question 16.

12. What was the nature of your previous commercial whale-watching experience?

Boat-based ☐
Land-based ☐
Both land-based and boat-based ☐
Don't remember ☐

13. Altogether, how many times have you been on a commercial whale-watching tour (your best estimate)?

1-3 times ☐
4-6 times ☐
7-9 times ☐
More than 10 times ☐

14.a) Please indicate, at each of the locations listed below, the number of times you have had previous whale-watching experience on a commercial whale-watching tour?

	Number of times
Atlantic Canada	☐
Western Canada	☐
Central and Northern Canada	☐
Northeastern U.S.	☐
U.S., excluding Northeastern region	☐
Mexico	☐
The Caribbean	☐
The British Isles	☐
Australia and/or New Zealand	☐
Other _____	☐

14.b) Have you ever been on a commercial whale-watching tour specifically in St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island) before?

Yes ☐
No ☐
Don't remember ☐

If "yes," please indicate the number of times you have been on a commercial whale-watching tour specifically in St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island): _____

15. Have you ever been whale watching with this particular tour operator before?

Yes	☐
No	☐
Don't remember	☐

If "yes," please indicate the number of times you have previously been whale watching with this particular tour operator: _____

Customer awareness of management practices

16. Do you know that Canada's Department of Fisheries and Oceans (DFO) has a voluntary list of whale-watching guidelines for vessel conduct during whale-watching tours?

Yes, I am aware that the DFO has whale-watching guidelines	☐
No, I am not aware that the DFO has whale-watching guidelines	☐

If "no," please skip to question 18.

If "yes," from which source(s) did you get to know about the DFO whale-watching guidelines? Please specify: _____

17. Do you know any provisions under the DFO whale-watching guidelines?

Yes	☐
No	☐

If "no," please skip to question 18.

If "yes," please briefly specify the provisions you know under the DFO whale-watching guidelines.

_____

_____

_____

18. Tour operators in the Bay of Fundy also have a voluntary Code of Ethics for vessel conduct during whale-watching tours. Do know about this Code of Ethics?

Yes, I am aware that tour operators in the Bay of Fundy have a Whale-watchers Code of Ethics ☐

No, I am not aware that tour operators in the Bay of Fundy have a Whale-watchers Code of Ethics ☐

If "no," please skip to question 20.

If "yes," from which source(s) did you get to know about the Bay of Fundy Whale-watchers Code of Ethics? Please specify:_____

19. Do you know any provisions under the Bay of Fundy Whale-watchers Code of Ethics?

Yes ☐
No ☐

If "no," please skip to question 20.

If "yes," please briefly specify the provisions you know under the Bay of Fundy Code of Ethics.

_____
_____
_____

20. Do you know if this particular commercial whale-watching operator endorses the Bay of Fundy Whale-watchers Code of Ethics?

I know that this tour operator endorses the Bay of Fundy Whale-watchers Code of Ethics ☐

I know that this tour operator does not endorse the Bay of Fundy Whale-watchers Code of Ethics ☐

I don't know whether or not this tour operator endorses the Bay of Fundy Whale-watchers Code of Ethics ☐

Customer motivations

21. Using the scale below, can you please rate each of the following in terms of their importance to your decision to come whale-watching?

1= not at all important
2= not important
3= a little important
4= important
5= very important

	Not at all 1	2	3	4	Very 5
Scenery	☐	☐	☐	☐	☐
Wildlife	☐	☐	☐	☐	☐
Visiting friends/family	☐	☐	☐	☐	☐
Culture	☐	☐	☐	☐	☐
Outdoor pursuits	☐	☐	☐	☐	☐
Always wanted to go whale-watching	☐	☐	☐	☐	☐
This tour operator endorses the Bay of Fundy Whale-watchers Code of Ethics	☐	☐	☐	☐	☐
TV advertising	☐	☐	☐	☐	☐
Advertising in tourism brochures/booklets	☐	☐	☐	☐	☐
School/educational purposes	☐	☐	☐	☐	☐
Remoteness of the open sea	☐	☐	☐	☐	☐
Peace/quiet	☐	☐	☐	☐	☐
Business purposes	☐	☐	☐	☐	☐
Children wanted to come	☐	☐	☐	☐	☐
Just looking for an excursion	☐	☐	☐	☐	☐
Recommendation from someone	☐	☐	☐	☐	☐
Photography	☐	☐	☐	☐	☐
Enjoy boat trips	☐	☐	☐	☐	☐
Other (please specify): _____	☐	☐	☐	☐	☐

22. What is the primary reason why you chose this particular tour operator? Please check only one.

Least expensive tour I could find	☐
Previous experience with tour operator	☐
Tour operator endorses the Bay of Fundy Whale-watchers Code of Ethics	☐
First whale-watching tour I happened to come across	☐
Recommendation from someone	☐
TV and/or newspaper advertising	☐
Advertising on the internet	☐
Advertising in a tourism brochure/booklet	☐
Someone else chose this tour operator, not I	☐
I know this tour operator as a friend or family member	☐
I researched and chose this particular tour operator from a list of tour operators	☐
This tour operator guarantees that whales will be seen during the tour	☐
No particular reason why	☐
Other (please specify) _____	☐

Beliefs and expectations

23. From 1 through 6, please rank the following types of marine wildlife in terms of their importance for you to see during this tour? (Note: 1 indicates the type of marine wildlife that is most important for you to see. 6 indicates the type of marine wildlife that is least important for you to see.)

Fish	☐	Dolphin	☐
Whale	☐	Porpoise	☐
Seabird	☐	Seal	☐

24. Do you believe that you'll see a whale during this tour?

Yes	☐
No	☐
I don't know	☐

If "don't know," please skip to question 25.

If "no," can you please specify why you do not believe that you'll see whales on this tour? Please check as many as apply.

Didn't see a whale on a previous trip	☐
I heard from word of mouth that it's difficult to locate/see whales	☐
Bad weather	☐
Other (please specify) _____	☐

If "yes," can you please specify why you do believe that you'll see whales on this tour? Please check as many as apply.

Saw whales on a previous trip	☐
I heard from word of mouth that there are lots of whales in this area	☐
Good weather	☐
T.V. and/or newspaper advertising	☐
Advertising on the internet	☐
Advertising in tourism booklets/brochures	☐
Assurances by the tour operator and/or tour employee	☐
Other (please specify)_____	☐

25. How important is it for you to see a whale?

	1	2	3	4	5	
Not at all important	☐	☐	☐	☐	☐	Very important

26. Which whale species would you most prefer to see during the tour? Please check only one.

Bowhead whale	☐	Finback whale	☐
Sperm whale	☐	Grey whale	☐
Humpback whale	☐	Beluga whale	☐
Orca (Killer) whale	☐	Minke whale	☐
I don't know	☐	I have no preference	☐

Other (please specify):_____

27. Which whale species do you expect to see during the tour? Please check as many as apply.

Bowhead whale	☐	Finback whale	☐
Sperm whale	☐	Grey whale	☐
Humpback whale	☐	Beluga whale	☐
Orca (Killer) whale	☐	Minke whale	☐
I don't know	☐	I have no expectations	☐

Other (please specify):_____

If you chose any of the whale species in the above question (# 27), why do you expect to see this whale species?

I saw this species on a previous tour	☐
I heard from word of mouth that this species can be found in this area	☐
T.V. and/or newspaper advertising	☐
Advertising on the internet	☐
Advertising in tourism booklets/brochures	☐
Assurances from the tour operator and/or tour employee	☐
I don't know	☐
Other _____	

28. Which type of whale behaviour do you expect to see during this tour? Please check as many as apply.

Whale blow	☐
Breaching	☐
Swimming	☐
Feeding	☐
Nursing/Care of young	☐
Diving	☐
Spy hop	☐
Pectoral fin slap	☐
Other (please specify): _____	
I don't know	☐

If you chose any of the behaviours in the above question (# 28), why do you expect to see this behaviour?

I saw this behaviour on a previous tour	☐
I heard from word of mouth that whales in this area exhibit this behaviour	☐
This behaviour was shown in a newspaper advertisement	☐
I've seen whale tours on television or film and this behaviour was shown	☐
Advertising on the internet	☐
Advertising in tourism booklets/brochures	☐
Assurances from the tour operator and/or tour employee	☐
I don't know	☐
Other _____	

29. What is the minimum number of whale sightings that you would consider to be satisfactory for this tour?

1- 5 sightings	☐
6-15 sightings	☐
16-25 sightings	☐
26-35 sightings	☐
35-50 sightings	☐
More than 50 sightings	☐
I don't know	☐

30. What is the minimum proximity to a whale that you would consider to be satisfactory for this tour?

Less than 5 metres/ less than 5.5 yards	☐
5-20 metres/ 5.5 -22 yards	☐
20- 40 metres/ 22-44 yards	☐
40- 60 metres/ 44-66 yards	☐
60-100 metres/ 66-109 yards	☐
More than 100 metres/ more than 109 yards	☐
I don't know	☐

YOU HAVE REACHED THE END OF THE PRE-TOUR QUESTIONS. THANK YOU FOR YOUR COOPERATION. PLEASE COMPLETE THE POST-TOUR SURVEY AS YOU ARE RETURNING TO DOCK.

PLEASE MAKE SURE YOU HAVE COMPLETED ALL 11 PAGES OF THE PRE-TOUR QUESTIONS BEFORE ANSWERING THE POST-TOUR QUESTIONS.

Post-tour

Customer experience

1.a) Did you see any whales during the tour you just completed?

Yes	☐
No	☐
Don't know	☐

If "no" or "don't know," please skip to question 9.

If "yes," which whale species did you actually see during the tour? Please check as many as apply.

Bowhead whale	☐	Finback whale	☐
Sperm whale	☐	Grey whale	☐
Humpback whale	☐	Beluga whale	☐
Orca (Killer) whale	☐	Minke whale	☐
I don't know	☐	Other (please specify):_____	

1.b) Altogether, how many whale sightings did you actually experience during the tour (your best estimate)?

1- 5 sightings	☐
6-15 sightings	☐
16-25 sightings	☐
26-35 sightings	☐
35-50 sightings	☐
More than 50 sightings	☐
I don't know	☐

2. Which whale behaviours did you actually see during this tour? Please check as many as apply.

I saw whale blows	☐
I saw whales breaching	☐
I saw whales swimming	☐
I saw whales feeding	☐
I saw whales nursing/taking care of young	☐
I saw whales diving	☐
I saw the whales spy hopping	☐
I saw pectoral fin slaps	☐
I saw the backs of whales	☐
Other _____	
I don't know	☐

3. On average, how long were the individual sightings with the whales you saw on the tour?

Less than one minute	☐
1-3 minutes	☐
About five minutes	☐
5-10 minutes	☐
10-15 minutes	☐
More than 15 minutes	☐
I don't know	☐

4. Did you see the whale species you most wanted to see during the tour?

Yes	☐
No	☐
I had no preference	☐

5. Did you see the whale species you expected to see during the tour?

Yes	☐
No	☐
I had no expectations	☐

6. Overall, how well did your actual experience with the whales you saw during the tour match your expectations?

Well below my expectations	☐
Below my expectations	☐
Met my expectations	☐
Above my expectations	☐
Well above my expectations	☐
I don't know	☐
I had no expectations	☐

7. How well did your actual experiences regarding various types of interaction with the whales match your expectations?

	Fell below	Met	Exceeded	I had no expectations
Number of whales sighted	☐	☐	☐	☐
Length of the whale sightings	☐	☐	☐	☐
Proximity to whales	☐	☐	☐	☐
Nature of the whale sightings	☐	☐	☐	☐
Landscape	☐	☐	☐	☐
Seascape	☐	☐	☐	☐
Other _____	☐	☐	☐	☐

8. Is there anything you feel could have improved your interaction with the whales you saw during the tour?

Yes	☐
No	☐

If "no," please skip to question 9.

If "yes," which aspect of your interaction with the whales could have been better? Please check as many as apply.

More sightings	☐
Fewer sightings	☐
Longer sightings	☐
Shorter sightings	☐
Closer approaches	☐
Further approaches	☐
Type of whale behaviour seen	☐
Would have liked to touch the whales	☐
Fewer customers on the boat	☐
Better behaviour of the customers on the boat	☐
Better visibility	☐
Better weather, in general	☐
Fewer boats in the vicinity during a sighting	☐
Would have liked more information about the whales	☐
Other (please specify) _____	

9. Did you see any other marine life, besides whales on the tour you just completed?

Yes	☐
No	☐
Don't know	☐

If "no" or "don't know," please skip to question 14.

If "yes," what other marine life besides whales did you actually see during the tour? Please check as many boxes as apply.

Dolphin	☐
Porpoise	☐
Seal	☐
Seabird	☐
Fish	☐
Other (please specify) _____	
Don't know	☐

10. Besides whales, did you see other marine life you wanted to see during the tour?

Yes ☐
No ☐
I had no preference ☐

11. Besides whales, did you see other marine life you expected to see during the tour?

Yes ☐
No ☐
I had no expectations ☐

12. Besides whales, did you see any other marine life you did not expect to see during the tour?

Yes ☐
No ☐
I had no expectations ☐

If "yes," please name the marine life you did not expect to see but actually did see during the tour: _____

13. Overall, how well did your actual experience with the marine life other than whales match your expectations?

Well below my expectations ☐
Below my expectations ☐
Met my expectations ☐
Above my expectations ☐
Well above my expectations ☐
I don't know ☐
I had no expectations ☐

Perceptions of whale-watching management

14. Since taking the tour, do you now have concerns about the welfare of whales?

Yes ☐
No ☐

If "no," please skip to question 15.

If "yes," can you please briefly specify what it is about the tour you just completed that has now raised concerns about the welfare of whales?

_____

_____

15. Since taking the tour, has your concern for the welfare of whales changed?

Yes ☐
No ☐

If "no," please skip to question 16.

If "yes," how has your concern for the welfare of whales changed since taking this tour? Please check only one box.

I am definitely more concerned than before the tour ☐
I am a little more concerned than before the tour ☐
I am a little less concerned than before the tour ☐
I am definitely less concerned than before the tour ☐

If "definitely more concerned" or "a little more concerned," what is/are the main area(s) of your concern now?

Oil spills ☐
Marine litter ☐
Survival of young ☐
Commercial Whaling ☐
Entanglement in fishing nets ☐
Disturbance from whale watching activities ☐
Disturbance from offshore oil activities ☐
Disturbance from military activities ☐
Other _____

Reduction in available food supply ☐
Pollution ☐
Low numbers/Extinction ☐
Aboriginal Whaling ☐

Can you please briefly specify what it is about the tour you just completed that has caused your concern about the welfare of whales to change?

_____

_____

16. During the tour you just completed, did the conduct of the vessel you were on and/or other vessels in your vicinity raise any concerns at all about the welfare of the marine life being viewed?

Yes ☐
No ☐

If "no," please skip to question 17.

If "yes," which vessel's conduct concerned you?

The conduct of the vessel I was on but not the other vessels in the vicinity ☐
The conduct of the vessel I was on and the other vessels in the vicinity ☐
The conduct of the vessels in the vicinity but not the vessel I was on ☐

If "yes," which type of vessel conduct concerned you? Please check as many as apply.

Vessels too close to wildlife	☐
Too many vessels viewing wildlife at one time	☐
Noise of the vessels	☐
Vessel presence seemed to disturb whales	☐
Vessels chasing the wildlife	☐
Vessels following the wildlife	☐
Too much time spent viewing the wildlife	☐
Vessel approaching wildlife too fast	☐
Other _____	

17. Overall, how well do you feel the tour you just completed was managed by the tour operator, in terms of the welfare of the wildlife being viewed?

	1	2	3	4	5	
Very poorly managed	☐	☐	☐	☐	☐	Very well managed

Customer Satisfaction

18. How would you rate the quality of the information you may have received about the wildlife being viewed during the tour?

Very poor	☐
Poor	☐
Neither poor nor good	☐
Good	☐
Very good	☐
Didn't receive any information about the wildlife being viewed	☐
I don't know	☐

19. Is there anything specific that you would have liked more information about?

Yes	☐
No	☐

If "yes," please specify:_____

20. How would you rate your overall experience on this tour?

Very dissatisfying	☐
Dissatisfying	☐
Neither dissatisfying nor satisfying	☐
Satisfying	☐
Very satisfying	☐
I don't know	☐

21. Based on your experience on this whale-watching tour, are you likely to go whale-watching again?

Definitely no	☐
Probably no	☐
I don't know	☐
Probably yes	☐
Definitely yes	☐

22. Based on your experience on this whale-watching tour, are you likely to return to this particular tour operator for another tour?

Definitely no	☐
Probably no	☐
I don't know	☐
Probably yes	☐
Definitely yes	☐

23. Based on your experience on this whale-watching tour, would you recommend whale-watching, in general?

Definitely no	☐
Probably no	☐
I don't know	☐
Probably yes	☐
Definitely yes	☐

24. Based on your experience on this whale-watching tour, would you recommend this particular tour operator?

Definitely no	☐
Probably no	☐
I don't know	☐
Probably yes	☐
Definitely yes	☐

25. Has your experience on this tour changed your outlook on whales and whale-watching in anyway?

Yes	☐
No	☐

If "no," please skip to question 26.

If "yes," how has your experience on this tour changed you? Please check as many as apply.

Influenced my attitudes on the environment/conservation of wildlife ☐
Influenced me emotionally ☐
I learned more about whales and marine life in general ☐
Influenced my attitudes on whale-watching as a business ☐
Other _____

26. How would you compare the cost of this trip with your experience?

The experience was definitely not worth the cost of the trip ☐
The experience was somewhat not worth the cost of the trip ☐
I don't know ☐
The experience was somewhat worth the cost of the trip ☐
The experience was definitely worth the cost of the trip ☐

General Information

27. Which one of the following best describes you?

Local resident ☐
Visitor ☐

If "local resident," please skip to question 36.

28. From where have you travelled to come to St. Andrews or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

From within New Brunswick ☐
From elsewhere in Atlantic Canada
_(Newfoundland and Labrador, Nova Scotia, or PEI) ☐
From Quebec ☐
From Ontario ☐
From Western Canada
_(Manitoba, Saskatchewan, Alberta, British Colombia) ☐
From Northern Canada (Yukon, Nunavut, NWT) ☐
From Northeastern U.S. ☐
From U.S., but not Northeastern region ☐
Other _____

29. Have you previously visited St Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Yes ☐
No ☐

If "yes," please indicate the number of times you have previously visited St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?: _____

30. What is the length of your current visit to St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Less than a day ☐
1-3 days ☐
4 days-1 week ☐
1-2 weeks ☐
More than 2 weeks ☐

31. Is this whale-watching tour the primary purpose of your visit to St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Yes ☐
No ☐

32. Were you aware that whales were present in the Bay of Fundy before arriving in St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Yes ☐
No ☐

33. Were you aware that whale-watching opportunities in the Bay of Fundy existed before arriving in St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Yes ☐
No ☐

34.a) From which source did you first become aware of whale-watching opportunities in St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Friends/family	☐	T.V. advertising	☐
Internet advertising	☐	Local press	☐
National press	☐	Tourism booklet/brochure	☐
Word of mouth	☐	Previous trip	☐
Travel agent	☐	Hotel/motel	☐
Tourist travel centre	☐	Walking/driving past tour businesses	☐

Other _____

34.b) From which source did you first become aware of this particular tour operator?

Friends/family	☐	T.V. advertising	☐
Internet advertising	☐	Local press	☐
National press	☐	Tourism booklet/brochure	☐
Word of mouth	☐	Previous trip	☐
Travel agent	☐	Hotel/motel	☐
Tourist travel centre	☐	Walking/driving past tour business	☐

Other _____

35. Did you book this tour before arriving in St. Andrews and/or the Fundy Isles (Deer Island, Campobello Island, Grand Manan Island)?

Yes ☐
No ☐

36. Please check the box that best describes the structure of your group for this tour. (Note: "child" means anyone less than 18 years of age)

1 adult, no child(ren)	☐
2 adults, no child(ren)	☐
More than 2 adults, no child(ren)	☐
1 adult, with child(ren)	☐
2 adults, with child(ren)	☐
More than 2 adults, with child(ren)	☐

37. In which age group are you?

18-30 ☐
31-55 ☐
Over 55 ☐

38. What is the highest level of education that you have completed?

Primary school	☐
Secondary school	☐
College	☐
Undergraduate university	☐
Post-graduate university	☐

39. Which of the following best describes the area (e.g. city, town) in which you currently live?

Urban ☐
Suburban ☐
Rural ☐

40. Did you get the chance to vote in the last federal/national elections in which you were eligible to vote?

Yes	☐
No	☐
Not eligible to vote	☐

YOU HAVE REACHED THE END OF THE QUESTIONNAIRE. PLEASE MAKE SURE YOU HAVE COMPLETED ALL 22 PAGES OF THIS ENTIRE QUESTIONNAIRE. PLEASE MAKE SURE TO RETURN THE COMPLETED SURVEY TO THE RESEARCHER WHEN YOU LEAVE THE BOAT. THANK YOU FOR YOUR COOPERATION.

APPENDIX C

Table A6. Examples of conservation and ecosystem monitoring efforts in the Bay of Fundy, Gulf of Maine and Scotian Shelf (modified from Tyrrell, 2005. p 6-7)

Name of Organization	Comment
Atlantic Reference Centre	- Sponsored by the Huntsman Marine Science Centre in St. Andrews, NB and the DFO - stores a collection of marine life; conducts research in marine taxonomy, biodiversity and ecology
Bay of Fundy Ecosystem Partnership	- a "virtual," multidimensional organization that encourages communication and cooperation between all persons and organizations interested in the Bay of Fundy - works with various groups on a number of conservation issues (sublittoral ecology and habitat conservation)
Conservation Law Foundation and WWF Canada Marine Conservation Project	- a joint habitat-mapping project for the Gulf of Maine and Scotian Shelf using physical and biological information to identify important areas for conservation
Cooperative Research Partners Initiative (CRPI)	- a partnership between the National Marine Fisheries Service in the U.S. and the New England Fisheries Management - their goal is to produce improved scientific data for fishery management decisions and to facilitate communication and collaboration among New England's commercial fishermen, marine scientists and fishery managers
Gulf of Maine Mapping Initiative	- a multi-year project to map the entire sea floor of the Gulf of Maine to better inform decision-making for management of ocean resources
Gulfwatch	- a chemical-contaminants monitoring program under the Gulf of Maine Council on the Marine Environment involving scientists and managers from universities and agencies near the Gulf of Maine - uses blue mussels as an indicator species of pollutants in coastal waters
Northeast Channel Coral Conservation Area	- a joint effort between the DFO and the fishing industry to address the possible impacts of fisheries on deep-sea corals - management initiatives (e.g. restrictions on bottom-fishing gear) were imposed in 2002 in an area of the Northeast Channel

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