

Economic Impact Assessment of the Potential For National Park Reserve Lands on Bowen Island

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Executive Summary

Background

Parks Canada has embarked on an assessment of the feasibility of establishing national park reserve lands on Bowen Island. The feasibility process will involve a number of different phases including an early-stage assessment of the economic costs and benefits of the proposed park. That is the purpose of this report.

The approach used in this assessment is to identify the economic effects of Parks Canada operations and increased visitation on Bowen Island, specifically in reference to businesses, community organizations, infrastructure and community services.

Community Profile

The population for Bowen Island Municipality (BIM) has grown from 2,975 at incorporation in 1999 to just over 3,605 in 2009 (BC Stats, 2010), representing an increase of 630 or 21.3 percent. The age profile of the population is uncommon in the BC context—larger proportions in the under 19 and 50-64 age categories are offset by smaller proportions of the 20 to 39 years and over 65 age groups. The recent Bowen Island Official Community Plan (OCP) process has projected relatively robust population growth on the Island over the next 25 years. The median growth scenario projects 5,100 residents by 2031 (BIM 2010).

Bowen Island's labour force, at just over 2,000 in 2006, is concentrated in two industries, construction and professional, scientific and technical services. The economy in general, and employment in particular, is oriented toward service activities. The resident labour force is relatively mobile as 44% travel elsewhere in the Greater Vancouver Regional District (GVRD) to their regular place of work. Median incomes of both male and female workers on the Island are well above the GVRD averages.

Statistics Canada estimates 535 business establishments on Bowen Island in 2008, with concentrations in construction services (102), accommodation and food/beverage service (16), arts and entertainment (21), transportation (13) and trade (41). The construction economy on Bowen Island is dominated by residential activity, which accounted for 96% of the total construction value between 2003 and 2009. The vast majority of this activity is for single detached homes.

Development Concept and Impacts of Parks Canada Spending

National park reserve lands on Bowen Island would be developed and managed to provide memorable opportunities for visitors to appreciate, understand and enjoy the Island environment in sustainable, low-impact ways. The existing range of day use visitor opportunities would be retained and access to park lands would continue to be primarily by walking, hiking, bicycling and horseback riding. The existing trail system, day use areas and picnic sites would be redesigned and, where necessary, expanded and rebuilt to national park standards and to improve the quality of the visitor experience. Other upgrades could include designated parking and trailheads, and the addition of multi-purpose trails to accommodate horseback riding and mountain biking. The overnight experience would provide primitive camping

opportunities, but not a vehicle accessible campground. Other overnight opportunities could be made available through the use of restored historic cabins in Snug Cove or other facilities, such as yurts, that are becoming a popular form of overnight accommodation in protected areas. All park visitors would be encouraged not to bring their vehicles to the Island and rely on alternative forms of transportation and access to the Island.

The estimated capital spending on the park would be \$10 million, with another \$2 million in annual operating expenditures. The impacts of these expenditures for Bowen Island are shown in the following table.

ES1 Economic Impacts of Parks Canada Capital and Operating Expenditures, Years 1 to 5

	Low	Medium	High
Spending	\$1,976,000	\$2,280,000	\$2,584,000
Employment (person years)	30.8	36.1	41.5
Employment Income	\$1,035,000	\$1,175,000	\$1,262,000

Park Visitation Forecast and Impacts

Visitation to Bowen Island is estimated at 79,000 in 2010, with approximately 15% of that accounted for by seasonal residents. Net visitation of approximately 69,000 visitors, comprised mainly of day-trip travellers, generates annual spending of approximately \$2.85 million. Growth in visitation (i.e. without the park) is expected to be about 27% over the next 15 years.

The anticipated visitor impacts associated with the proposed park are shown in Table ES2, with low, medium and high estimates of park visitation for years 5, 10 and 15. In Year 5, attendance is expected to range from a low of 317,000 visitors to a high of 322,000. The large majority of users (275,000) are Bowen Island residents. The incremental impacts of the proposed park, estimated in Year 5 to be between 2,000 and 7,200 new visitors, are therefore small in comparison. This level of visitation will generate employment of between one and four person-years and employment income of between \$32,000 and \$128,000. The impacts grow over time as visitation and spending increases.

Effects on Bowen Island

Private Business

The business impacts will generally be positive as construction contractors, tourism operators and companies supplying general goods and services will have the opportunity to do business with Parks Canada and cater to the increasing number of travellers coming to the Island.

In the first five years of development and operation, between 31 and 45 person-years of employment and an associated \$1.1 million and \$1.4 million in employment income will accrue to local businesses.

ES2 Economic Impacts of Park Visitors, Years 5, 10 and 15

	Base (2010)	Year 5	Year 10	Year 15
Visitors to Bowen Island (without park)				
Number	79,000	85,500	92,000	98,500
Expenditures	\$2,854,000	\$3,107,000	\$3,359,000	\$3,612,000
Projected Park Users - Low				
Total	301,961	316,870	329,800	345,510
Residents	275,461	286,270	296,740	310,070
Visitors	26,500	30,600	33,050	35,440
New (incremental) visitors		2,010	2,180	2,330
Spending		\$90,350	\$97,600	\$104,620
Employment (person-years)		1.1	1.2	1.2
Employment income		\$31,800	\$34,300	\$36,800
Projected Park Users - Medium				
Total	301,961	318,970	332,070	347,940
Residents	275,461	286,270	296,740	310,070
Visitors	26,500	32,700	35,330	37,870
New (incremental) visitors		4,310	4,660	5,000
Spending		\$198,380	\$214,300	\$229,730
Employment (person-years)		2.3	2.5	2.7
Employment income		\$69,700	\$75,300	\$80,800
Projected Park Users - High				
Total	301,961	321,590	334,900	350,980
Residents	275,461	286,270	296,740	310,070
Visitors	26,500	35,320	38,170	40,910
New (incremental) visitors		7,190	7,770	8,330
Spending		\$364,110	\$393,320	\$421,610
Employment (person-years)		4.3	4.7	5.0
Employment income		\$128,000	\$138,300	\$148,200

Non-Commercial Organizations

There are at least six non-commercial organizations on Bowen Island that would be affected by the proposed park because they use land that would be in the park or operate close by. These organizations include the Bowen Island Horse Owners and Riders Association, the Bowen Island Off Road Cyclists Association, the Bowen Island Museum, the Bowen Island Heritage Preservation Association, the Bowen Island Fish and Wildlife Club and the Bowen Island Memorial Garden Society. Except for the Museum, each of these organizations invests, maintains or otherwise contributes to infrastructure within the proposed park boundaries. Because none of these organizations engage in economic activities that would be significantly altered by a National Park, adverse economic effects are not anticipated.

Infrastructure

The major effects of the park are expected to be in the area of ferry services. In Year 5 of park operation (when demand from new park visitors will begin to level out) the growth in vehicle traffic on the ferry system will be in the order of 7% (low visitor estimate) to 26% (high visitor estimate) above base case growth. When measured against total annual demand on the Horseshoe Bay to Snug Cove route, this new demand (between 750 and 2,679) represents a 1% to 3% increment over current annual volume of 256,000 vehicles. The major issue with ferry services is not the magnitude of new demand but its timing. New demand may occur outside of peak periods, in which case the ferry system has ample capacity. However, weekends, particularly holiday summer weekends, are vulnerable. Overload data for the 2010 operating season shows that if incremental demand appears during these peak periods it will result in more overloads and wait times. In this event, the real effect of the park is to bring demand forward in time, thus prompting a service response from BCF and the provincial government sooner rather than later. The nature of that response is unknown at this time, but could involve a mix of demand-management measures and new servicing options.

As with ferry demand, incremental vehicle traffic on the Island would be relatively minor, in the order of 1% to 1.5% above current August traffic volumes on Miller Road. The effect would be to advance maintenance, or upgrades to a higher standard, on municipal roads linked to the park or its facilities. For now, roads do not conform to any consistent standards and would undoubtedly require enhancements. Measures to avert parking congestion at Snug Cover and Horseshoe Bay during peak summer periods would also be necessary.

The implications for Bowen Island's water and sewer system would most likely be via the increased use of commercial establishments in the Snug Cove area. This new demand could be accommodated by independent systems and would not be expected to accelerate or modify BIM's current plans for expanding their services. No water system would be directly affected by the park.

Other Public Services

The effects of the park on municipal administration, policing, ambulance, fire and safety, waste and health services were all evaluated. Increased administrative costs to the municipality are anticipated and these would be offset by payments-in-lieu of taxes (PILT) by Parks Canada, currently estimated at \$55,000 annually. The municipality does not receive any taxes or payments-in-lieu from the proposed park lands at this time.

Increased demand for police and fire services would likely occur as visitation to the Island increases. However, the presence of Park Wardens and Parks Canada park management procedures for fire and emergency situations would in fact represent an enhancement to service levels compared to today. In addition, Parks Canada is obligated to negotiate agreements with these service providers, the results of which are expected to be cost-neutral at a minimum.

In light of the proposed park's marginal contribution to Bowen Island's population growth, effects on the quality of health care services are not anticipated.

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Abbreviations

AADT	Average Annual Daily Traffic
AEQ	Automobile Equivalents
BCF	British Columbia Ferry Services Inc.
BIM	Bowen Island Municipality
BIVC	Bowen Island Visitor Centre
ha	hectares
EA	Environmental Assessment
ECOMM	Emergency Communications - 911
GINPR	Gulf Islands National Park Reserve
GVRD	Greater Vancouver Regional District
KIR	Key Resource Indicator
km	kilometres
MOT	Ministry of Transportation and Infrastructure
NPR	National Park Reserve
OCP	Official Community Plan
PILT	Payments in Lieu of Taxes
PY	Person-year
ROW	Right-of-Way
VEC	Valued Economic Component

1 Introduction

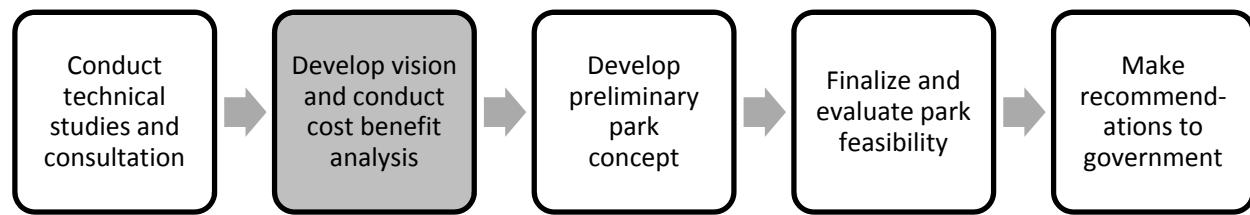
1.1 Background

Parks Canada has embarked on an assessment of the feasibility of establishing national park reserve lands on Bowen Island. The purpose of their assessment is twofold:

1. To determine, from Parks Canada's perspective, whether the lands and adjacent marine environment of Bowen Island offer sufficient potential for engaging greater Vancouver's urban audience in a memorable national park experience, and contribute sufficiently to the representation of the Strait of Georgia Lowlands Natural Region in the national park system, to warrant the establishment of national park reserve lands.
2. To determine, from Bowen Island's perspective, whether there is community support for the establishment of national park reserve lands on Bowen Island.

The feasibility assessment will involve a number of different phases and associated actions as outlined in Figure 1. In parallel with the initial public consultations to introduce the project on Bowen Island and in West and North Vancouver, Parks Canada will further assess the potentially available land base and adjacent coastal and marine environment of Bowen Island to determine whether they meet national park criteria, how they could support a range of visitor opportunities and experiences, and whether there are significant land use or other management issues that would need to be resolved.

Figure 1 National Park Reserve Feasibility Assessment Process



A second key component of the feasibility assessment process involves developing a vision for the prospective national park reserve, using as a foundation both Parks Canada's policies and the aspirations of the Bowen Island community as reflected through the recently updated Official Community Plan ("OCP"). The formulation of the vision will be followed by the development of optional and preliminary park concepts which would include a potential boundary, or optional boundaries, for national park reserve lands on the Island.

With the land quantum identified, Parks Canada would then work with the Bowen Island community to develop a more detailed picture of what national park reserve lands on the Island would look like, what visitor opportunities could be provided and how the lands would be managed within the national park

mandate. From this part of the process would emerge a set of key high level management strategies that would comprise a significant part of the preliminary national park concept. Extensive consultations will occur with the Bowen Island community, First Nations and stakeholders on these elements of the national park proposal.

1.2 Purpose

As indicated in the process diagram above, the economic costs and benefits of the proposed park reserve are to be determined early in the feasibility process. The results, along with those of the land analysis and the development of a vision and key management strategies, will be used to guide subsequent park planning.

The purpose of this study, therefore, is to analyse and estimate the possible economic costs and benefits for the Bowen Island community of the establishment of national park lands on the Island. Specifically, the analysis addresses the economic impacts, positive or negative, the establishment of national park reserve lands might have on local businesses and institutions, and what an estimated potential increase in visitation would mean for community services and infrastructure.

1.3 Study Terms of Reference

The Terms of Reference for this study are limited to economic effects—the “social and ecological costs and benefits of park establishment will be conducted separately”. Specifically, the following valued economic components (VECs) are addressed:

- Private businesses (mostly related to businesses directly affected by increased expenditures associated with the Project);
- Non-commercial institutions and organizations that contribute to the Island’s economy;
- Physical infrastructure, particularly roads and the ferry service ; and
- A range of municipal services.

Values not addressed in this study include the following:

- Effects on crown land tenures (e.g. forestry, mining and energy permits and licences); and
- Effects on lifestyle (e.g. due to changes in allowed uses such as hunting, berry-picking, firewood collection and off-road motorized vehicle).

The Terms of Reference also identified three anticipated effects that would be the focus of the assessment. They are:

- The potential increase in visitation to, and of visitor expenditures on, the Island;
- The infusion of capital into the community through direct investments by Parks Canada in staff, facilities, housing, offices and equipment and associated investments by the private sector based on establishment and operation of the national park reserve lands; and
- Payments in Lieu of Taxes (PILT).

This study looks at the different economic costs and benefits of the proposed Project from the perspective of Bowen Island residents, businesses and local government. It does not consider the implications of the proposed park from the perspective of Parks Canada, the province or society in general.

1.4 Methodology

The methodology employed in this report is similar to provincial and federal agency guidelines for projects undergoing a formal environmental assessment (EA) process. The process is as follows:

- The Project is described as a connected series of elements that might have economic implications;
- Key values and how these might interact with the Project are identified;
- Baseline conditions are documented;
- Base Case conditions in the absence of the Project are described; and
- The potential effects of the Project are identified according to the nature of change in key indicators.

The EA approach is based on an impact framework, not a social benefit-cost one. Benefit-cost analysis recognizes that because society has scarce resources to meet its needs, it should compare the increase in social income (i.e. benefits) to the social income foregone (i.e. costs) in deciding how those resources are allocated. The output of the analysis is usually a monetized stream of costs and benefits expressed as a net present value. Benefit-cost analysis is most often used by government for evaluating major infrastructure or program investment options.

Economic impact analysis examines the effects of a project or activity on the economy of a given area, in our case a proposed national park reserve on Bowen Island. Importantly, the analysis here is not from the perspective of society but from Bowen Island and its residents. The effects, which are characterized as changes in key indicators such as employment or local government revenues, are meant to inform decision-making by identifying where mitigation for dealing with adverse impacts might be warranted.

While the EA and the cost-benefit approaches use much of the same information, they are used to address different issues. Given the above, the values and expectations expressed in the Terms of Reference for the feasibility process are more fully answered using an impact analysis approach.

1.5 Report Structure

Chapter 2 provides a community profile of important demographic, labour force and economic characteristics as context for assessing Project impacts. **Chapter 3** introduces two causal factors that are expected to give rise to the majority of economic effects. First, the main elements of the park concept, as well as they can be defined at this stage of the feasibility process, are discussed. The anticipated costs of development by Parks Canada is included. This is followed by a visitor forecast that addresses how the park might change travel patterns on Bowen Island, and the implications this would have for tourism activity. **Chapter 4** presents the effects assessment for each of the four values outlined in the Terms of Reference. This begins with a review of base case conditions and a determination of the most likely affects of the Project. Supporting research, methodologies and data tables are presented in the appendices.

2 Community Profile

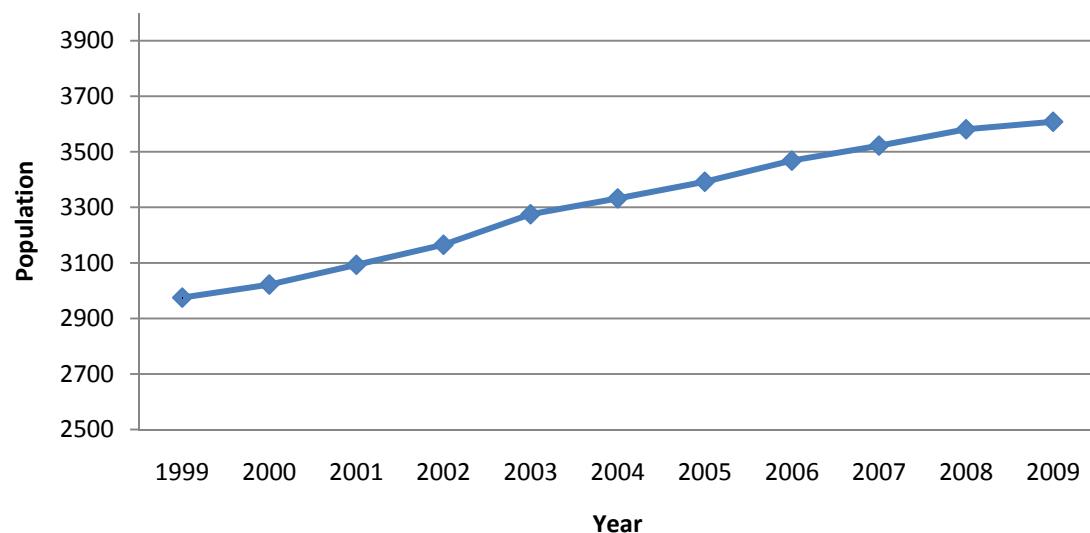
The following profile comprises key demographic, labour force and economic indicators that provide context for a discussion of how a national park reserve on Bowen Island might affect the community.

2.1 Population

2.1.1 Historical and Current Population

The population of Bowen Island Municipality (BIM) has grown from 2,975 at incorporation in 1999 to just over 3,605 in 2009 (BC Stats, 2010). This represents a population increase of 630 or 21.3 percent. In comparison, the Greater Vancouver Regional District has grown by 14.5 percent and the entire province by 11.1 percent over the same period.

Figure 2 Bowen Island Population, 1999 to 2009



Source: BC Stats (2010)

2.1.2 Age Characteristics

Table 1 presents population age data for Bowen Island, the GVRD and BC in 2006. Bowen Island has a significantly larger share of its population in the 50 to 64 age category but a lower share in the 65 and older age group. After 70 years of age, the proportions drop off rapidly, which may be indicative of better availability of senior care and other services in neighbouring municipalities.

Among the younger age groups, Bowen Island has a larger share of residents under the age of 19 years (24.6%), compared to the GVRD (22.9%) and BC (23.2%), but lower shares of adults aged 20 to 39 years (17.0%), compared to 28.4% in the GVRD and 25.8% in BC. This drop-off is typical of many rural and semi-rural communities in BC where young adults will leave either for to pursue education and training opportunities, or to take advantage of better labour market opportunities.

Table 1 Age Characteristics for Bowen Island, GVRD and BC, 2006

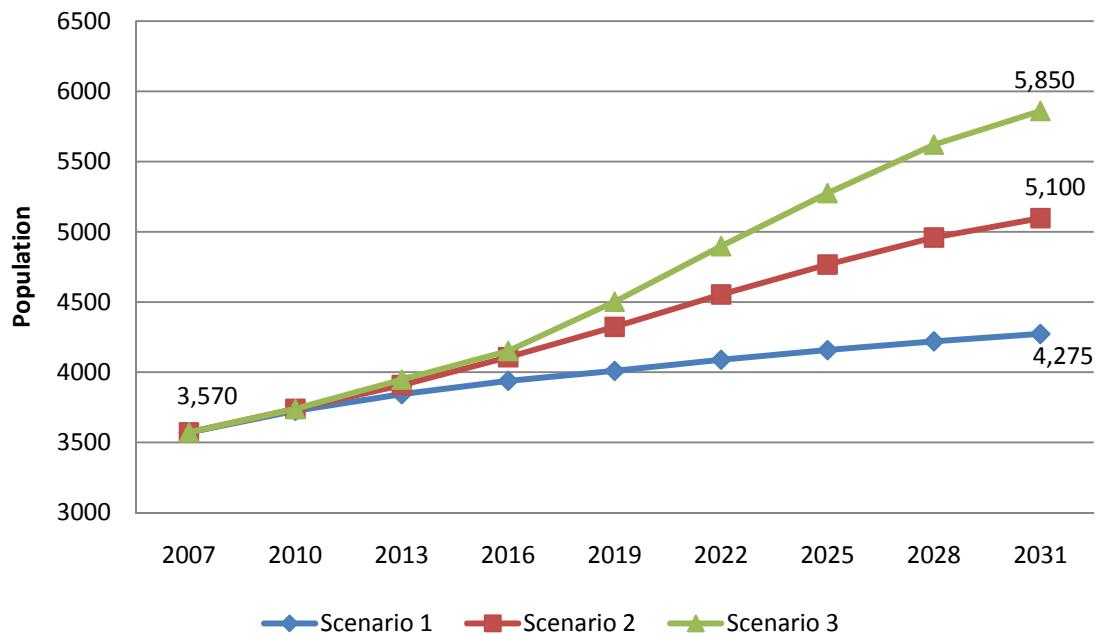
Age	Bowen Island		GVRD	BC
	(#)	(%)	(%)	(%)
Age 0 to 19 years	830	24.6%	22.9%	23.2%
Age 20 to 39 years	570	17.0%	28.4%	25.8%
Age 40 to 49 years	645	19.4%	17.0%	16.5%
Age 50 to 64 years	910	26.8%	18.8%	20.0%
Age 65 and Over	410	12.2%	12.9%	14.5%
Total	3,365	100.0%	100.0%	100.0%

Source: Statistics Canada (2006)

2.1.3 Population Projection

Figure 3 shows historical and projected populations for Bowen Island between 2007 and 2031, for three different growth scenarios. The projected population in Scenario 1 is 4,275 in 2031, a 20% growth over 2007. The population in Scenario 3 is 5,850, a 64% gain.

Figure 3 Population Projections for Bowen Island, 2007 to 2031



Source: Bowen Island Municipality (2010)

The projections were derived from work undertaken to support the recent update to the Bowen Island Official Community Plan (OCP) process. In *Background Paper #2* three different scenario forecasts are presented. Scenario 1 is based on work done by Urban Futures for BC Ferries in 2008 as part of their passenger volume modelling research. Scenario 3 is based on projecting the historical growth (1980 to 2010) rate for Bowen Island into the future, while Scenario 2 represents the mid-point between the high and low projections.

2.1.4 Education Attainment

Table 2 shows the education attainment for working age residents of Bowen Island, Greater Vancouver Regional District and the province. When compared to the GVRD or BC, a higher percentage of the Bowen Island residents age 25 to 64 have attained a university degree or diploma. In fact, in 2006, 71% of residents had some higher level of education compared to 66% for the GVRD and 52% for the province. Only 5% of Bowen Island had not completed grade 12 compared to 10% for the GVRD and 12% for the province.

Table 2 Education Characteristics for Bowen Island, GVRD and BC -2006 (age 25 to 64)

Age 25 to 64	Bowen Island		GVRD	BC
	(#)	(%)	(%)	(%)
No certificate; diploma or degree	105	5%	10%	12%
High school certificate or equivalent	445	23%	24%	26%
Apprenticeship or trades certificate or diploma	85	4%	9%	12%
College; CEGEP or other non-univ. certificate or dipl.	435	22%	19%	20%
Univ. certificate or diploma below the bachelor level	100	5%	7%	6%
University certificate; diploma or degree	800	41%	31%	24%
Total	1,970	100%	100%	100%

Source: Statistics Canada (2006)

2.2 Labour Force

2.2.1 Experienced Labour Force

Table 3 presents the 2006 experienced labour force¹ for the Bowen Island Municipality, the GVRD and BC. Bowen Island's goods producing labour force is concentrated in construction while the professional, scientific and technical labour force also account for a larger share when compared to the GVRD and BC.

Table 3 Experienced Labour Force for Bowen Island, GVRD and BC, 2006

	Bowen Island	GVRD	BC
Agriculture, Forestry, Fishing	20	0.9%	1.2%
Mining/Oil and gas	10	0.5%	0.4%
Utilities	10	0.5%	0.5%
Construction	275	13.0%	6.3%
Manufacturing	80	3.8%	8.4%
Total Goods Producing	395	18.7%	16.8%
Wholesale	30	1.4%	5.3%
Retail	130	6.1%	10.7%
Transportation & Warehousing	80	3.8%	5.6%
Info & Cultural Industries	115	5.4%	3.6%
Finance & Insurance	60	2.8%	4.8%
Real Estate & Rental/Leasing	35	1.7%	2.5%
Prof., Scientific & Tech. Service	285	13.4%	9.2%
Admin & Support, Waste Manag.	110	5.2%	4.8%
Education Services	195	9.2%	7.1%
Health Care & Social Assistance	150	7.1%	9.2%
Arts, Entertainment & Recreation	150	7.1%	2.3%
Accommodation and Food Services	160	7.5%	7.8%
Other Services (excluding public administration)	120	5.6%	5.0%
Public Administration	105	5.0%	3.8%
Total Services Sector	1,725	81.3%	81.7%
Unclassified	0	0	1.5%
Total Labour Force	2,120	100.0%	100.0%

Source: BC Stats (2010)

¹ An experienced worker is defined as someone fifteen years of age or older who worked for any or all of the period between January 1, 2005 and the week before census day (May 16, 2006).

2.2.2 Mobility of Employed Labour Force

Table 4 shows the place of work for the Bowen Island, GVRD and BC employed labour forces. Bowen Island has a significantly higher share of the labour force working from home than either the GVRD or BC.

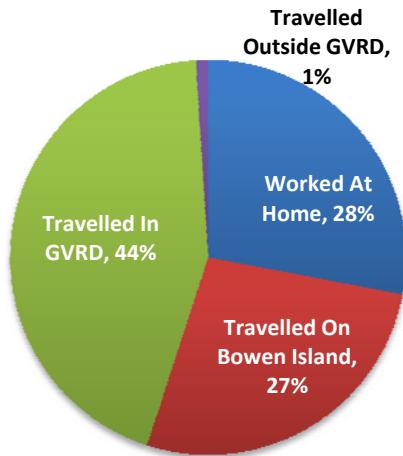
Table 4 Work Status for Employed Labour Force on Bowen Island, 2006

Characteristics	Bowen Island			(% Share For Total Employed)		
	Male	Female	Total	Bowen Island	GVRD	BC
Worked At Home	210	240	450	22%	8%	9%
Worked Outside Canada	10	0	10	0%	1%	1%
No Fixed Workplace Address	330	125	455	22%	12%	13%
Worked At Usual Place	550	620	1170	56%	79%	77%
Total Employed Labour Force 15 Years & Over	1,095	985	2,085	100%	100%	100%

Source: Statistics Canada (2006)

Figure 4 shows the location of work for the employed labour force on Bowen Island in 2006. Fifty-five percent worked at locations on Bowen Island while 45% travelled either within the GVRD or outside.

Figure 4 At Home and Usual Place of Work for Bowen Island Employed Labour Force, 2006



Source: Statistics Canada (2006)

2.3 Incomes

2.3.1 Median Income

Table 5 presents the median incomes for Bowen Island residents and the Greater Vancouver Regional District (GVRD) between 2004 and 2008. Incomes are higher in BIM, and they are growing faster, than the GVRD benchmark. In 2008, median incomes for males was 27% above the GVRD median, while for females, it was 18%.

Table 5 Median Income for Bowen Island and the GVRD Residents, 2004 to 2008

	Bowen Island		GVRD	
	Male	Female	Male	Female
2008	\$46,275	\$28,890	\$36,310	24,530
2007	\$46,300	\$28,790	34,910	23,445
2006	\$42,995	\$25,715	32,940	21,675
2005	\$39,555	\$24,150	30,905	20,410
2004	\$37,500	\$22,105	29,545	19,630
% Change (2004- 2008)	+23.4%	+30.7%	+22.8%	+25.0%

Source: BC Stats, Neighbourhood Income and Demographics (2006-2010)

2.3.2 Income Distribution

In 2008, Bowen Island residents reported total personal income of \$125.3 million. The distribution of income for Bowen Island residents is shown in Table 6.

Table 6 Income Distribution for Bowen Island and GVRD Residents, 2008

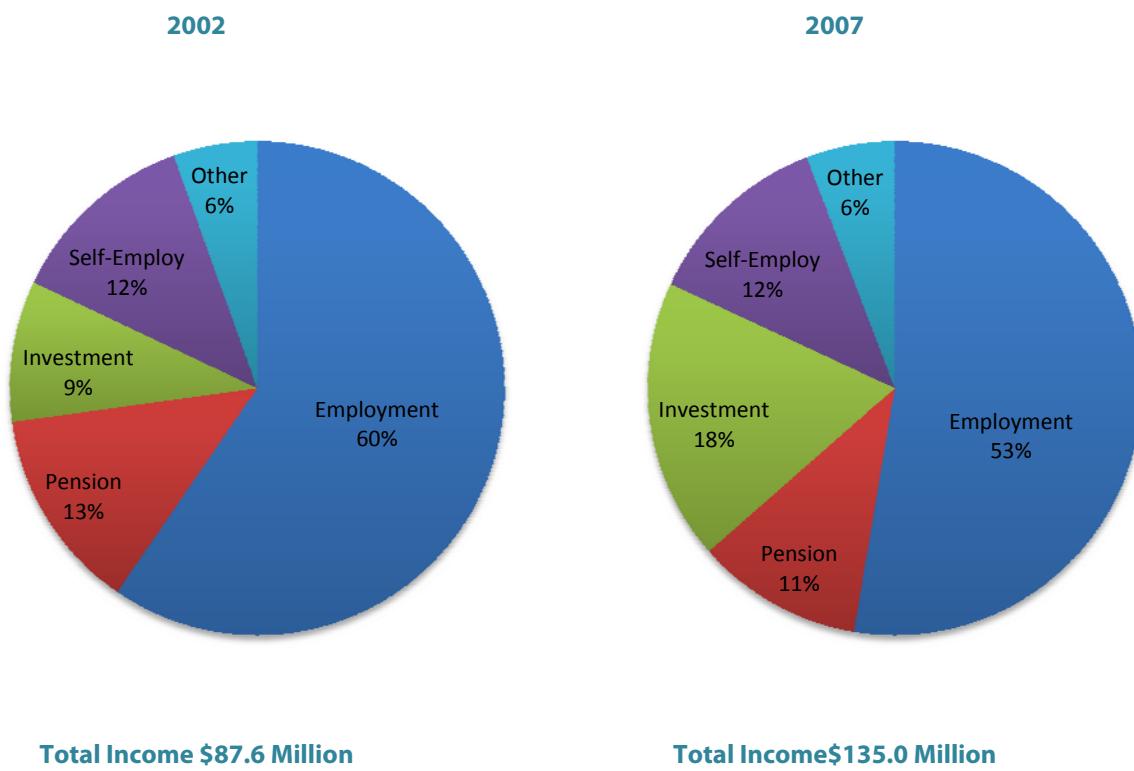
Income Distribution	(#)	(%)	(%)
With Total Income up to \$15,000	540	23%	29%
With Total Income up to \$25,000	330	14%	16%
With Total Income up to \$35,000	260	11%	12%
With Total Income up to \$50,000	350	15%	16%
With Total Income up to \$100,000	580	25%	21%
With Total Income greater than \$100,000	280	12%	7%
Total Returns with Income	2,340	100%	100%

Source: BC Stats, Neighbourhood Income and Demographics (2006-2010)

2.3.3 Income By Source

Figure 5 presents the personal income shares by income source for residents of Bowen Island for 2002 and 2007. Residents derive the majority of their income from employment income followed by investment income. The share of investment income grew sharply over the period while the proportion of employment and pension income declined. Self-employment and income from other sources remained steady.

Figure 5: Bowen Island Income By Source, 2002 and 2007



Source: BC Stats (2010c)

2.4 Business Indicators

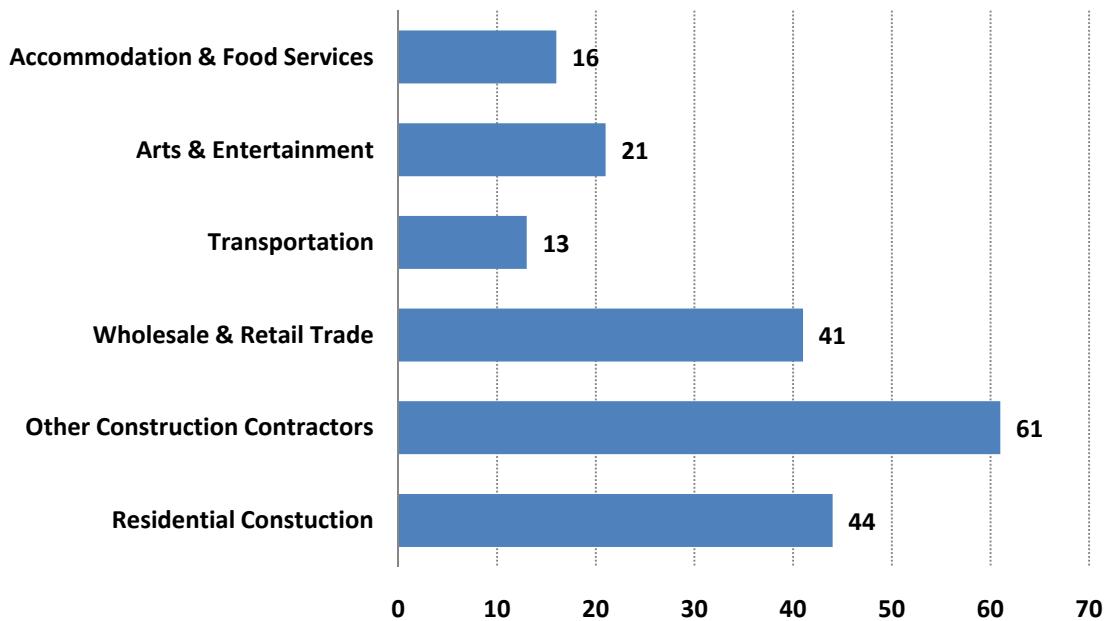
2.4.1 Establishment Counts

Statistics Canada estimates of the number of business establishments on Bowen Island in June, 2008 are summarized in Figure 6 for those business classes that are believed to be most impacted by the NPR (More detailed establishment count data is available in Appendix E).

A total of 535 establishments were documented in 123 industries. The establishments most likely to be affected by the park include accommodation and food/beverage service (16), arts and entertainment (21), transportation (13), trade (41), residential construction (44) and “other” construction (61).

These estimates only provide a partial picture of the actual business activity and capacity on Bowen Island as they are establishment counts only; they do not provide insights into where those businesses deliver their services. For example, the number of construction companies on Bowen Island exceeds construction employment, which would suggest that some contractors are active off-Island. The establishment counts also tend to underestimate those sectors where there are many levels of informal services. An example would be in the accommodation and food and beverage sector—Statistics Canada estimates a total of 16 establishments, when 50 is a likely count, based on operator listings in the Bowen Island Gold Pages.

Figure 6 Bowen Island Establishment Counts, June 2008



Source: Statistics Canada Business Register Data (2010)

2.4.2 Building Permit Values

Building permit values have been relatively steady on Bowen Island over the last five years (Table 7). Construction is driven by the residential sector which accounted for 96% (\$68.5 million) of total construction value between 2003 and 2009.

Table 7 Bowen Island Building Permit Values, \$000, 2003 to 2009

	2003	2004	2005	2006	2007	2008	2009
Residential	3,536	11,512	10,297	10,688	13,227	9,715	9,489
Commercial	201	895	70	1,153	90	3	52
Industrial	0	0	0	313	0	40	200
Institutional	0	0	10	0	0	0	0
Total Building Permits	3,737	12,407	10,377	12,154	13,317	9,758	9,741

Source: BC Stats (2010c)

2.4.3 Residential Dwelling Construction

Table 8 presents the residential housing units constructed on Bowen Island between 2003 and 2009. Activity is focused on single family dwellings.

Table 8 Bowen Island Residential Dwelling Units, Number, 2003 to 2009

	2003	2004	2005	2006	2007	2008	2009
Single Dwelling Units	15	40	34	28	29	20	15
Row Dwelling Units	0	0	0	0	0	0	0
Apartment Units	0	0	0	0	0	3	4
Total Residential Units	15	40	34	28	29	23	19

Source: BC Stats (2010c)

3 Project Definition and Economic Impacts

3.1 Introduction

The definition of the Project is an important consideration of this analysis because it drives the impacts that will lead to economic effects on Bowen Island. This includes the land area being considered for the park reserve, proposed changes in land use, facility development, the timing of development and expected incremental visitor use.

The park reserve concept was provided to the consultants by Parks Canada for the purposes of this assessment and is based on the best understanding of the park proposal at this time. The park proposal will become more refined and could change in the future in light of new information. Such changes may have implications with respect to the economic effects assessment presented here.

The consulting team was responsible for producing a forecast of park attendance and estimated the associated economic impacts.

3.2 Definition of the Project

3.2.1 Potential Park Reserve Properties

Figure 7 shows a preliminary list of land components that would be considered for the park reserve on Bowen Island. There are seven blocks of Crown land, in addition to Crippen Regional Park, Apodaca Provincial Park, Apodaca Mountain Ecological Reserve, Islands Trust Fund lands and some Municipal lands. The total area of these properties is approximately 2178² hectares.

Private lands could eventually be considered as part of the park reserve, for example through third party purchase or donation. However, Parks Canada has not identified nor is contemplating specific private lands in its preliminary concept.

3.2.2 Description of the Properties

From a visitor use perspective, Bowen Island has potential to enable Parks Canada to reach a substantial urban audience. The focus of the opportunity on the Island is Crippen Regional Park which draws approximately 275,000 visitors each year, a total which likely underestimates use of backcountry areas, including hiking on Mount Gardner. Most of these visitors remain in the Crippen Park/Snug Cove/Killarney Lake area where Parks Canada could effectively focus its communications efforts, especially if an arrangement could be made to access the original USC store, now the community library, for interpretative programming. A summary of major properties and their recreation use/potential is provided in Table 9.

² Excludes consideration of private lands and off-Island provincial marine parks.

Figure 7 Potential National Park Reserve Properties of Interest

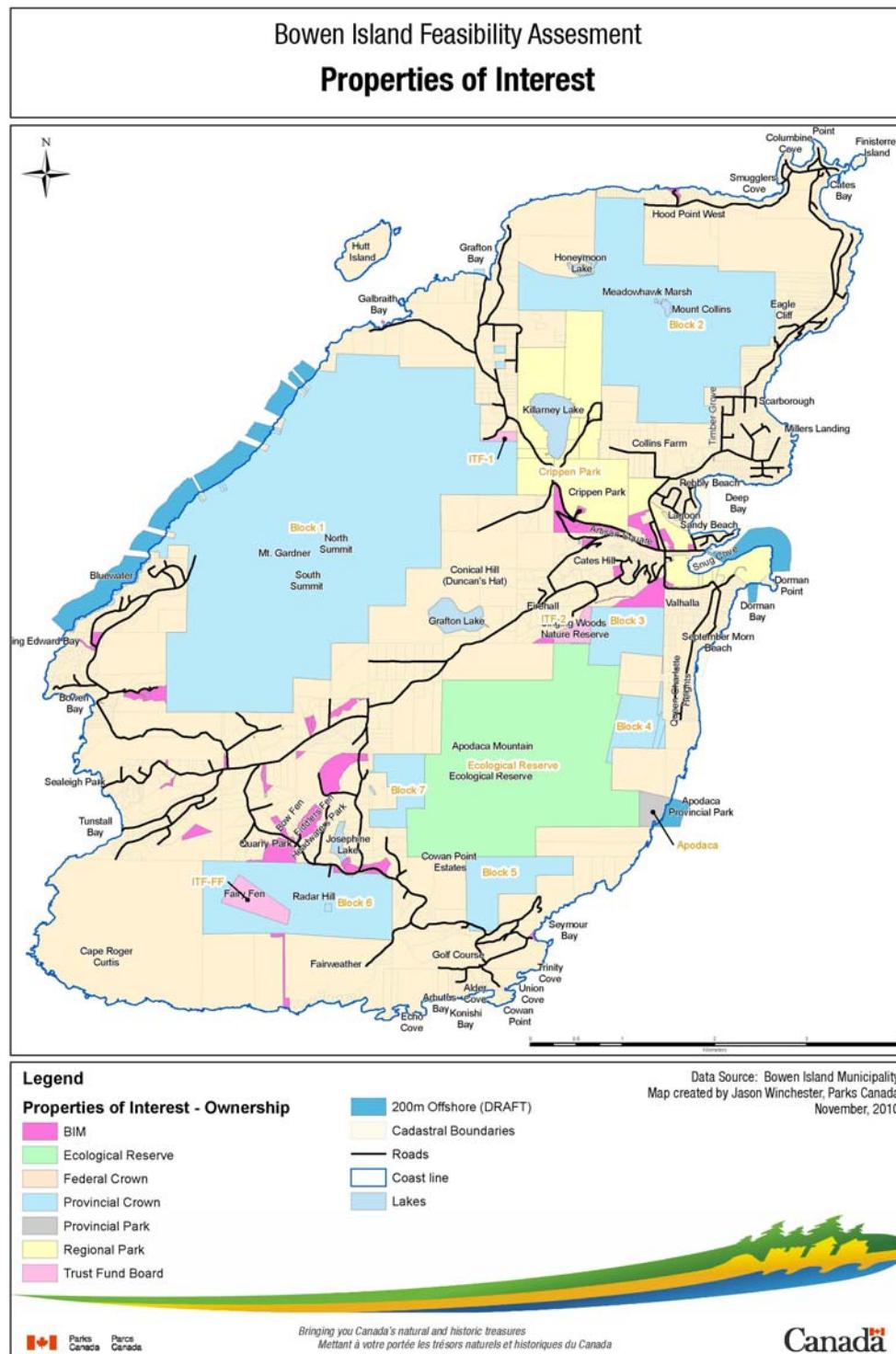


Table 9 Recreational Attributes of Proposed Park Areas

Unit	Visitor Opportunities
Block 1 Mount Gardner	<ul style="list-style-type: none"> • Most extensive and most challenging hiking opportunity on the Island • Some opportunities for kayaking and bird watching • Opportunity for ecological and outdoor learning programs
Block 2 Collins Ridge-	<ul style="list-style-type: none"> • Moderate hiking opportunities, but access and viewscapes are limited
Blocks 3 and 4 Snug Cove	<ul style="list-style-type: none"> • Some hiking opportunities but limited by steep slopes
Block 5 Cowan Point	<ul style="list-style-type: none"> • Moderate hiking opportunities, some limited viewing opportunities
Block 6 Crown Marsh (Fairy Fen)	<ul style="list-style-type: none"> • Moderate hiking opportunities, with Fairy Fen as a destination • Provides important connectivity to other open spaces and trails to Mount Gardner and Crippen, linking ecosystems at all elevations.
Block 7 Little Josephine Lake (Hen Cloud Forest)	<ul style="list-style-type: none"> • Moderate hiking opportunities, limited viewing opportunities.
Crown Islets	<ul style="list-style-type: none"> • Visitor use discouraged due to ecological sensitivity
Crown Shoreline Reserves	<ul style="list-style-type: none"> • Very limited to no opportunities
Apodaca Mountain Ecological Reserve (#48)	<ul style="list-style-type: none"> • Visitor opportunities likely to remain limited to some hiking
Apodaca Provincial Park	<ul style="list-style-type: none"> • No facilities in Apodaca, lack of access • Some day use and primitive camping but use levels low • Opportunities for viewing, photography, nature study and shore-based fishing with the potential to provide a unique walk-in or kayak-in camping and picnicking experience.
Crippen Regional Park	<ul style="list-style-type: none"> • High use levels for day use activities including picnicking, hiking and nature appreciation. • Along with Snug Cove, central to Bowen Island visitor experience • Picnic ground, heritage orchard, some original United Steamship Company cottages • Network of well marked trails • Central feature is the 1.6 km trail to Killarney Lake which links up with a 4 km trail circling the lake.
Singing Woods Nature Reserve	<ul style="list-style-type: none"> • Limited potential for casual walking and nature appreciation
David Otter Nature Reserve	<ul style="list-style-type: none"> • Limited potential for casual walking and nature appreciation
Bowen Island Municipal Lands	<ul style="list-style-type: none"> • Limited potential for casual walking and nature observation

Source: Henwood (2010)

The other Bowen properties offer similar opportunities to Crippen and Mount Gardner but to a more limited extent.

The education market is also a consideration in assessing the merits of Bowen Island for urban engagement. There is potential on Bowen for offering outdoor field programs to compliment the curriculums of the almost 300,000 students in K-12 in greater Vancouver. Out-of-school learning experiences are in high demand in Vancouver.

Bowen Island is also a popular weekend get-away for residents of Greater Vancouver. The Island continues to offer a relatively close natural, scenic and quiet environment for rest and relaxation, where other locations formerly offering similar opportunities have now been lost to development.

Approximately 43% of the Island is public land that offers varying levels of protection, including BC Crown land, a provincial park, an ecological reserve and a regional park. The Bowen properties under consideration in this assessment include all public lands on the Island, whether they are in provincial, regional or municipal ownership, as well as two reserves owned by the Islands Trust Fund.

3.2.3 Development Concept

National park reserve lands on Bowen Island would be developed and managed to provide memorable opportunities for visitors to appreciate, understand and enjoy the Island environment in sustainable, low-impact ways. The existing range of day use visitor opportunities would be retained and access to park lands would continue to be primarily by walking, hiking, bicycling and horseback riding. The existing trail system, day use areas and picnic sites would be redesigned and, where necessary, expanded and rebuilt to national park standards and to improve the quality of the visitor experience. Other upgrades could include designated parking and trailheads, and the addition of multi-purpose trails to accommodate horseback riding and mountain biking.

The day use experience would be augmented with an overnight experience with opportunities for walk-in, boat-in or bicycle-in primitive camping. Parks Canada would not provide a vehicle based campground. Other overnight opportunities could be made available through the use of restored historic cabins in Snug Cove or other facilities, such as yurts, that are becoming a popular form of overnight accommodation in protected areas. All park visitors would be encouraged not to bring their vehicles to the Island and rely on alternative forms of transportation and access to the Island.

A national park reserve on Bowen Island would place a focus on interpretation and educational programming to raise awareness of the natural and cultural heritage of Bowen Island and of the system of national parks, national historic sites and national marine conservation areas in Canada. Parks Canada would provide interpretation facilities catering to a broader audience, including school groups as well as park visitors, with year round programming. Interpretive and educational programs could be designed to ensure that visitors learn from and enjoy their experience through active participation, and partners could be sought to deliver appropriate recreational and educational experiences on national park reserve lands. Parks Canada would market and promote the park reserve to Parks Canada's target audiences in Vancouver.

In a national park reserve, Parks Canada would also provide a high level of protection and ecologically sound resource and park management practices to park lands, to help maintain and where necessary, restore ecological integrity and ensure the continued health and productivity of the Island's watersheds.

3.2.4 Estimated Expenditures by Parks Canada

Parks Canada has provided an estimate of the capital and operating costs associated with the development concept, as outlined in Table 10. The capital costs are mainly for development of park facilities, and amenities and amount to \$10 million. The timing of these expenditures is unknown but would likely occur in the first five years after park designation.

Operating expenditures are for payroll, other operating costs and payments-in-lieu of taxes to BIM. All these would accrue on an annualized basis and amount to \$2.05 million.

These estimates are preliminary in nature and should not be viewed as a commitment for funding of park operations. Park planning still has to proceed through other consultations with stakeholders and cannot specify the exact land base, service levels or the opportunities that would be publicly available. Nevertheless, Parks Canada does consider the expenditures realistic in light of development elsewhere in the national park system and in line with the proposed visitor experience.

Table 10 Estimate of Total Capital and Annual Operating Expenditures by Parks Canada

Capital Investment (total)	\$10,000,000
Operations (annual)	
Employment (person-years)	12
Payroll	\$960,000
Other expenditures	\$1,040,000
Payments in lieu of taxes	\$55,000
Total	\$2,055,000

Source: Parks Canada (2010)

Note: The timing of the capital investment is unknown but for the purposes of this assessment is assumed to be evenly distributed between years 1 through 5.

3.2.5 Economic Impacts

The economic impacts of the NPR are the sum of the direct impacts plus the “multiplier” employment and income as the direct expenditures circulate through the local economy. Expenditures by the NPR will stimulate economic through new demand for labour, goods and services on and off-Island. Not all that spending will accrue to Island residents and businesses, but the level of capture remains uncertain. Based on the experience of the Gulf Islands National Park Reserve (GINPR) we have estimated high, medium and low estimates of spending going to local businesses and workers.

The two key assumptions are that local contractors received anywhere from 40% to 60% of construction contracts for park development. The proximity to the Lower Mainland would undoubtedly attract competitive bidding on most tenders but local companies and workers would still be expected to participate in those contracts. Anywhere from 65% to 85% of PC employees are assumed to reside on the Island, in keeping with Parks Canada policy that encourages (but cannot mandate) local residency.

Table 11 shows estimates of annual employment and income accruing to the local economy in the first five years of operation and development, given the expenditures provided in Table 10. Total employment of between 24 and 32 person-years of employment will generate employment incomes of between \$1.09 million and \$1.26 million. The economic model used to quantify the impacts is presented in Appendix A.

Table 11 Economic Impacts of Parks Canada Operations on Bowen Island, Years 1 to 5

	Low	Medium	High
Average Employment (person-years)			
Construction			
Direct	5.2	6.5	7.8
Indirect	1.4	1.8	2.2
Total	6.6	8.3	9.9
Operations			
Direct	21.7	25.1	28.4
Indirect	2.4	2.8	3.1
Total	24.1	27.8	31.6
Average Annual Employment Income (\$2010)			
Construction	\$560,000	\$571,000	\$581,000
Operations	\$528,000	\$604,000	\$681,000
Local Government Revenues (\$2010)			
	\$55,000	\$55,000	\$55,000

Note: All impacts are for Bowen Island only and do not account for expenditures flowing off-island.

3.3 Park Visitation Forecast

If the NPR were established, it could reasonably be expected to affect visitor levels on Bowen Island. The degree to which visitation varies from current conditions, and more importantly from expected future conditions in the absence of the project, will directly influence the effects considered in Chapter 4.

The visitor forecast is based on the preliminary concept provided in 3.2. The full extent of the proposed park experience will be determined through the management planning, policies and programs that Parks Canada would set forth once park planning is completed. This would be done in consultation with the community.

The marketability of the Island would be enhanced because of increased exposure in travel literature regionally, nationally and internationally. Visitor interest would be stimulated by interpretive programs and recreation opportunities, as facilities and amenities are developed. There would be constraints on new demand for the park as well, such as travel costs, the relative significance of in-park features and the availability of substitute experiences within the region. While many popular outdoor activities such as hiking and camping are valued experiences of the national park system, other activities that may now be occurring on Crown land on Bowen Island (for example off-road motor vehicle use) may not be allowed in the proposed park.

This section of the report analyses three important dimensions of visitation and its effects on the community: baseline and base case conditions, an attendance forecast and the expected incremental

visitation to the Island that can be expected of the park and the impacts associated with that incremental visitation.

Data sources, data tables and assumptions related to this analysis are presented in Appendix B.

3.3.1 Base Case Conditions

An assessment of economic impacts of the proposed NPR requires a base case benchmark against which the Project case can be compared. The key indicators for such an assessment are the number of visitors and visitor spending, the latter of which is correlated to the length of time spent in the community. Unfortunately, a reliable estimate of baseline conditions on Bowen Island for these indicators does not exist.³

The only consistent and reliable measure of visitation to and from Bowen Island is traffic data from BC Ferries. Our estimates of visitation and expenditure levels in 2010, with forecasts for the next 15 years, are provided in Table 12. Visitation in 2010 is estimated at 79,000, with approximately 15% of that accounted for by seasonal residents. Net visitation of approximately 69,000 visitors is comprised mainly of day-trip travellers. Total spending of these visitors (excluding seasonal residents) is \$2.85 million. As noted in the table, overall growth in visitation is expected to be about 27% over the next 15 years.

Table 12 Base Case Forecast of Annual Visitors and Visitor Spending on Bowen Island

	Base year	Year 5	change from base	Year 10	change from base	Year 15	change from base
Total visitors	79,000	85,500	108%	92,000	116%	98,500	125%
Seasonal residents	10,200	10,700	105%	11,200	110%	11,700	115%
Net visitors	68,800	74,800	109%	80,800	117%	86,800	126%
Day-trip	48,800	52,800	108%	56,800	116%	60,800	125%
Overnight	9,000	10,000	111%	11,000	122%	12,000	133%
Boaters	11,000	12,000	109%	13,000	118%	14,000	127%
Total expenditures	\$2,854,000	\$3,107,000	109%	\$3,359,000	118%	\$3,612,000	127%

Note: Expenditures are for net visitors, and exclude seasonal residents.

In addition to current visitation levels, estimates of the proportion currently using the proposed park properties are needed to determine visitor impacts. Table 13 shows our estimate of the proportion of current and future visitors who would use either the existing parks or other lands. Our estimate of off-Island park property visitors in 2010 was 26,500 generating expenditures of over \$1.1 million. This was determined based on information gathered at the Bowen Island Visitor Centre (BIVC) which showed that 42% of all visitors to Bowen Island ask for park or outdoor recreation information when speaking to a travel counsellor. In other words, we have assumed that slightly less than one in two visitors (one in four boaters) actually visit the park properties today.

³ The lack of baseline data was noted in a 2006 study of the Bowen Island tourism sector by Tourism BC (Young 2006).

Table 13 Base Case Forecast of Annual Visitors and Visitor Expenditures to Bowen Island Using the Proposed Park Properties

	Base year	Year 5	change from base	Year 10	change from base	Year 15	change from base
Visitors	26,500	28,700	108%	31,000	117%	33,300	126%
Day-trip	20,400	22,100	108%	23,700	116%	25,400	125%
Overnight	3,800	4,200	111%	4,600	121%	5,000	132%
Boaters	2,300	2,510	109%	2,720	118%	2,930	127%
Expenditures	1,111,600	1,209,900	109%	1,304,200	117%	1,402,500	126%
Day-trip	791,000	857,000	108%	919,000	116%	985,000	125%
Overnight	237,000	262,000	111%	287,000	121%	312,000	132%
Boaters	83,600	90,900	109%	98,200	117%	105,500	126%

3.3.2 Visitor Forecast and Effects

The visitor forecast for the proposed NPR is shown in Table 14. It is presented in two parts, the first a projection of total park attendance and the second an estimate of incremental visitation. It is the latter that generates the economic impacts of the park.

The central issue of the incremental visitation estimate is the identification of the proportion of visitors that would not come to Bowen Island if the NPR did not exist. It would be incorrect to calculate the impacts of the NPR based on total anticipated park attendance, because we know that many visitors would come to the Island even if the NPR were not there. If they were to visit friends and relatives, use Crippen Park or mountain bike on Mt. Gardner, irrespective of the existence of the NPR, then we cannot say that they are new or incremental visits once the park is established.

The experience of GINPR serves as an example. Residents and most visitors counted as attending the park would have conducted their activities even if the park did not exist. In fact, since GINPR does not charge day-user fees, many non-resident visitors are unaware that they are even in a national park. In any case, incremental visitors are the segment of total visitors who will come specifically because of the national park—our impact estimates are based on these “new” visitors.

We also considered a secondary effect based on the assumption that establishing a park might alter visitor behaviour by extending stays or increasing spending. For example, even if someone came to Bowen Island anyway (and therefore was not an incremental visitor), they may extend their stay because of the park in order to take advantage of interpretive opportunities or improved facilities and access.

National park research in North America and abroad was used to help understand how the NPR would attract new visitors and spending over and above what would be anticipated in the absence of the project. High, medium and low increments to the existing visitor base were estimated.

As seen in Table 14, park attendance in Year 5 after park creation ranges from a low of 317,000 to a high of 322,000. By Year 15, attendance ranges from 346,000 (low) to 351,000 (high). Excluding residents, this

would put the NPR in a similar attendance category as Gulf of Georgia Cannery National Historic Site (NHS), Fort Rodd Hill/Fisgard Lighthouse (NHS) and Georgian Bay Islands National Park.

Table 14 Forecast of Annual Visitors to the NPR

	2010 Baseline	Year 5	change from base		change from base		change from base
			Year 10	Year 15	Year 10	Year 15	
Low - 7% Increment							
Park Attendance		316,870		329,800		345,510	
Residents	275,461	286,270		296,740		310,070	
Day-trip	20,400	23,680		25,570		27,410	
Overnight	3,800	4,410		4,760		5,100	
Boaters	2,300	2,510		2,720		2,930	
Incremental Visitation		2,010	7.6%	2,180	8.2%	2,330	8.8%
Day-trip		1,550	7.6%	1,670	8.2%	1,790	8.8%
Overnight		290	7.6%	310	8.2%	330	8.7%
Boaters		180	7.8%	190	8.3%	210	9.1%
Medium - 15% Increment							
Park Attendance		318,970		332,070		347,940	
Residents		286,270		296,740		310,070	
Day-trip		25,450		27,490		29,450	
Overnight		4,740		5,120		5,490	
Boaters		2,510		2,720		2,930	
Incremental Visitation		4,310	16.3%	4,660	17.6%	5,000	18.9%
Day-trip		3,320	16.3%	3,590	17.6%	3,840	18.8%
Overnight		620	16.3%	670	17.6%	720	18.9%
Boaters		380	16.5%	410	10.8%	440	11.6%
High - 25% Increment							
Park Attendance		321,590		334,900		350,980	
Residents		286,270		296,740		310,070	
Day-trip		27,660		29,880		32,020	
Overnight		5,150		5,570		5,960	
Boaters		2,510		2,720		2,930	
Incremental Visitation		7,190	27.1%	7,770	29.3%	8,330	31.4%
Day-trip		5,530	27.1%	5,980	29.3%	6,400	31.4%
Overnight		1,030	27.1%	1,110	29.2%	1,190	31.3%
Boaters		630	27.4%	680	29.6%	730	31.7%

3.3.3 Economic Impacts

The economic impacts of the NPR are shown in Table 15 on an annualized basis, with estimates given for spending, employment and employment income. Spending is allocated separately to day-trip visitors and overnight visitors because daily expenditures tend to be much higher for the latter group due to accommodation needs.

Table 15 Annual Visitor Spending, Employment and Employment Income Impacts

	Year 5	Year 10	Year 15
Low			
Incremental spending	\$90,300	\$97,600	\$104,600
Day-trip	\$64,400	\$69,500	\$74,500
Overnight	\$19,300	\$20,900	\$22,300
Boaters	\$ 6,700	\$ 7,200	\$ 7,800
Employment (person-years)			
Direct	1.00	1.08	1.16
Indirect	0.07	0.08	0.08
Total	1.07	1.15	1.24
Employment Income			
Direct	\$29,600	\$32,000	\$34,300
Indirect	\$2,200	\$2,300	\$2,500
Total	\$31,800	\$34,300	\$36,800
Medium			
Incremental spending	\$198,400	\$214,300	\$229,700
Day-trip	\$141,600	\$152,900	\$163,900
Overnight	\$ 42,500	\$45,900	\$ 49,200
Boaters	\$14,300	\$15,500	\$16,700
Employment (person-years)			
Direct	2.19	2.37	2.54
Indirect	0.15	0.17	0.18
Total	2.35	2.53	2.72
Employment Income			
Direct	\$65,000	\$70,200	\$75,300
Indirect	\$4,700	\$5,100	\$5,500
Total	\$69,700	\$75,300	\$80,800
High			
Incremental spending	\$364,100	\$393,300	\$421,600
Day-trip	\$261,700	\$282,700	\$302,900
Overnight	\$78,500	\$84,800	\$90,900
Boaters	\$23,800	\$25,800	\$27,800
Employment (person-years)			
Direct	4.02	4.35	4.66
Indirect	0.28	0.30	0.33
Total	4.31	4.65	4.99
Employment Income			
Direct	\$119,300	\$128,900	\$138,100
Indirect	\$ 8,700	\$9,400	\$10,100
Total	\$128,000	\$138,300	\$148,200

For employment and employment income, the indirect as well as direct impacts are estimated. Direct impacts derive from the spending of tourists. Indirect tourism jobs result from any local spending by the tourist industry itself. Induced impacts, which arise from the local spending of incomes earned by both direct and indirect tourism workers, are not calculated.

Other effects such as those experienced by the business community are discussed in Chapter 4.

The low visitor estimate generates modest incremental spending of approximately \$90,000 in Year 5, with an associated one person-year of employment and about \$31,000 in pre-tax employment income. By Year 15 these annual impacts would have increased slightly.

In the medium estimate spending is estimated at \$198,400 in Year 5, growing to \$229,700 by Year 15.

Over two person-years of employment and between \$70,000 and \$80,000 in employment income is maintained during this period.

The high estimate generates the most impacts, with new spending of \$364,100 in Year 5 leading to 4.3 person-years of employment and \$128,000 in employment income. By Year 15, spending rises \$421,600, generating five person-years of employment and \$148,200 in employment income.

3.4 Consideration of Population Effects

Population change is an important variable in economic impact analysis because it will have consequences for the quality and quantity of municipal services and infrastructure, particularly ferry services. The NPR could affect the population of Bowen Island from three different pathways: increased tourism employment, new Parks Canada employment and new amenity migration⁴ that might occur because of the existence of the park and its features.

In the absence of the NPR, future population growth is based on the most recent forecast prepared for BC Ferries by Urban Futures (2008). These forecasts are reproduced in section 2.1.3.

The anticipated effects from each pathway are as follows:

- As discussed in section 3.2.5, an estimated 65% to 85% of Parks Canada staff would reside on Bowen Island. Parks Canada policy is to encourage local residency for management and personnel. Some of these staffing opportunities are expected to be taken by existing residents while others will reside off-Island. The third group (i.e. new staff who will move to BIM) will increase population and housing demand but the magnitude of change will be minor (compared to total population and future expected growth).
- The tourism employment discussed in section 4.1.2 is not anticipated to boost local residency beyond what can be detected in the normal variation of in and out-migration. Resident workers will be the beneficiaries of this increased spending, taking new jobs or putting in more hours on existing positions.

⁴ Amenity migration is the movement of people into areas principally for the actual or perceived environmental, cultural or other benefits (i.e. amenities). The term was coined to describe the urban-to-rural migration phenomena, notably into US mountain regions, in the 1990s.

- The role amenity migration might play in local population change is beyond the resources of this study. However, it is our understanding that settlement on Bowen Island was, and continues to be, linked to the amenity migration phenomena and that the effects are already evident in base case conditions. Based on the GINPR experience, there does not appear to be a strong basis for expecting a wave of new in-migration strictly because of the existence of the park. Even if people were inclined to move to the community to be near the park, the cost and availability of real estate and ferry travel would have an off-setting influence.

For these reasons, we conclude that the NPR's population effect is likely to be small in light of future expected growth in the absence of the project, but still incremental.

4 Effects Assessment of NPR

The Terms of Reference for this study identified private business, non-commercial organizations, infrastructure and public services as the four values most likely to be impacted by the NPR. The following paragraphs evaluate each of these components against the base case conditions described in Chapter 2.

4.1 Private Business

The NPR would have implications for commercial businesses on Bowen Island both as the result of spending by Parks Canada on facilities and operations and spending by visitors. The main issue addressed here is how that increased spending filters through the local economy and how anticipated benefits might be manifested. Tourism and transportation businesses may reposition, promote and develop park-related tourism infrastructure and products in response to the park. Perhaps business, incentive travel and education markets could be attracted to the Island because of proximity to the NPR. In these situations, industry may perceive the NPR as an opportunity to diversify and expand their marketing efforts and, by extension, the tourism economic base on Bowen Island. Construction and service businesses hoping to conduct business directly with Parks Canada would also have new opportunities as the level of physical development and ongoing programming does not exist on the Island at this time.

The following profile and assessment is limited to those businesses that could be expected to directly benefit from NPR establishment, that is tourism operators, transportation providers, construction companies and businesses supplying services to Parks Canada operations.

4.1.1 Baseline Conditions

The number of businesses on Bowen Island and employment by industry and occupation were presented in Chapter 2. They show Bowen Island to be a service-oriented economy with little manufacturing or primary resource activity. The local economy is dominated by small businesses and many owner-operated establishments. A good portion of community income is earned by residents who work elsewhere in the Lower Mainland and by a wide variety of independent businesses, many of them professionals and artists, who may work locally but in fact sell their goods or services off-Island. The local economy is almost entirely dependent on off-Island sources of incomes and export-based services that are then re-circulated into the local service sector (e.g. retail, personal services, residential construction).

Tourism on Bowen Island is predominantly boaters, ferry visitors and some air charter passengers who come to the Island to visit friends and relatives, conduct business and for leisure purposes. Key market, product and destination characteristics are as follows:

- According to the Bowen Island Visitor Centre, visitors are mainly from BC (57%), Europe (12%), US (5%), other Canada (4%), local (10%) and other international (8%).
- Day visitors account for 84% of all visitors—the other 16% would be staying with friends and relatives or with local accommodators.
- Popular activities include hiking, kayaking, golfing, boating and nature observation. Weddings are also a noted trip purpose. Most visitors sightsee at Snug Cove as well.

- During the summer months Bowen Island is a very popular destination for transient boaters that stay for a day or in many cases overnight. There are two marinas, with the Union Steamship being the largest. Bowen Island attracts upwards of 11,000 boat nights during the cruising season, most of which come from the Lower Mainland. There are also many overnight boaters at Deep Bay but most will not dock or stay on land. Some spending on provisions accrues to this segment but reliable estimates are not available. The main issue is capacity, with the vast majority of boaters requesting weekend moorages and the volume being concentrated in the summer months. Transient moorages for boaters in the Lower Mainland is a coast-wide issue.
- Visitor services are provided by the Bowen Island Chamber of Commerce, which operates the BIVC in Snug Cove. The BIVC has operated year round in the past but is currently closed in the Winter.
- As noted in section 3.3.1, we estimate current annual visitation (excluding seasonal residents) at approximately 69,000, which generates an estimated \$2.85 million in revenue and between 40 and 45 person-years of employment for on-Island businesses.
- Businesses directly catering to visitors, either accommodators, tour operators, marinas and resort/retreat facilities, number about 50. Another 50 businesses, although they cater mainly to residents, would also derive some of their revenues from visitors—this group includes retailers, food services, gift stores and transportation. There are few “full-time” tourism businesses on Bowen Island—most are seasonal or derive their revenues from other sources (such as residents).

The construction industry is a major component of the Bowen Island economy. The experienced construction labour force on Bowen Island in 2006 was 275, and some would be working in the Lower Mainland. Most local construction activity is in the residential sector, with few projects in the commercial or industrial classes. For the seven year period ending in 2009, 95% of all permit values were for residential construction, with an annual value of just under \$10 million (see Table 7). When total construction spending is considered, the annual direct employment is estimated at about 70 person-years. The ratio of inferred local construction employment to the local construction labour force is therefore in the range of 25%.

Statistics Canada estimates more than 100 construction establishments on Bowen Island, but the Bowen Island Gold Pages only lists 20 or so construction contractors. The difference may be explained by independent sub-contractors and trades people who are self-employed and sell their services in sub-contract arrangements. The local construction sector consists of design firms, five general contractors, several firms specializing in home renovations and a number of excavating, road and paving contractors.

4.1.2 Project Effects Assessment

The Project will create new opportunities for businesses on Bowen Island, especially for tourism operators and construction companies during the early years of development leading up to build out of in-park facilities. The quantifiable impacts presented in Chapter 3 for Parks Canada spending and incremental visitor spending are summarized in Table 16. Construction spending is assumed to end in Year 5 once major facilities are built.

Table 16 Summary of Parks Canada and Visitor Employment and Employment Income Impacts on Bowen Island, Years 1-5

	Low	Medium	High
Employment (person-years)			
Parks Canada			
Construction	6.6	8.3	9.9
Operations	24.1	27.8	31.6
Tourism	1.1	2.3	4.3
Total	31.8	38.5	45.8
Employment (\$2010)			
Parks Canada			
Construction	\$560,000	\$571,000	\$581,000
Operations	\$528,000	\$604,000	\$681,000
Tourism	\$31,800	\$69,700	\$128,000
Total	\$1,119,800	\$1,244,700	\$1,390,000

Notes: Excludes spending and employment from Parks Canada expected to flow off-Island.

All tourism spending is assumed to flow to local operators.

As previously noted in section 3.3.3, the estimates for Parks Canada construction and operations shown in Table 16 are from the perspective of Bowen Island and account for the leakage of some spending off-Island. The impacts would ultimately depend on the ability of local contractors to secure bid projects directly, or to sub-contract with larger construction companies in the Lower Mainland. Parks Canada would be unable to give preferential consideration to local contractors as it is obligated to abide by competitive procurement policies.

The business impacts will generally be positive as construction contractors, tourism operators and companies supplying general goods and services will have the opportunity to do business with Parks Canada and cater to the increasing number of travellers coming to the Island. The scale of impacts obviously rises if local businesses increase their capture of Parks Canada spending. In the low and medium estimates, increments to annual construction activity on the Island is between 2% and 4%, while new visitor spending is between 1% and 2%. It is unlikely new businesses would be created but certainly employment opportunities will be measurable.

The tourism impacts will also emerge differently for businesses depending on the seasonality of incremental visitation. Demand appearing during the peak summer season would likely create new employment and possibly investment in services, whereas if it is distributed in the shoulder season and off season it would increase utilization of existing capacity (although some new facilities might still be built).

In the high estimate, we believe there would be evidence of new business activity emerging on Bowen Island, even though the incremental gain compared to the baseline still represents a relatively small portion of the markets these businesses already serve.

Long term, the research is mixed on the economic development effects Canadian national parks have on nearby communities. In Canmore, it is apparent that new tourism investments might not have occurred without the town being a gateway to Banff National Park (Byfield 1997). It is also true that Canmore has

location characteristics (e.g. situated on Highway 1) that may have influenced the feasibility of tourism development and overall economic diversity. Pacific Rim National Park and the protection of Clayoquot Sound may have stimulated tourism and economic development in Tofino and Ucluelet. However, given the outstanding nature of the physical, recreation and aboriginal cultural assets of the area, some level of development would likely have proceeded without the protected status. Communities that serve as gateways to US national parks in the western mountain region have generally experienced economic growth but not necessarily more diversification. This is particularly true of former forest and mine-dependent communities that were able to make a transition to tourism (i.e. dependence on one sector was replaced by dependence on another) (McMahon, 1998).

We also recognize that businesses serving the education market, of which there are several on Bowen Island, may well benefit from the park although the nature and extent of those benefits are uncertain.

There could also be negative outcomes for individual businesses on Bowen, although these would be very difficult to quantify until park planning is further advanced. Any in-park service such as accommodation that directly competes with the private sector may raise concerns about how benefits are being distributed. From an Island perspective, an overall increase in visitation, spending, employment and employment income accruing would be a net benefit, even though individual operators may be better or worse off depending on who actually gets the business. If the business community has concerns about these effects, then mitigation measures negotiated with Parks Canada may be required.

4.2 Non-Commercial Organizations

Non-commercial organizations could be affected by the proposed NPR if they are current land users or if some aspect of their operation might otherwise interact with park operations. Inasmuch as these organizations are non-commercial, the economic impacts are likely to be not substantial. The effects from a socio-community perspective, for example the case of an organization now using lands proposed for the park losing that right in the future, may be more potentially significant than any monetary loss. As this study is limited to economic impacts, the focus is on the financial implications for non-commercial organizations. The social implications of the park for these organizations and their members or guests are not covered in this report.

A number of non-profit and community groups use lands that may eventually form part of the National Park or are currently undertaking activities which may interact with Parks Canada activities. The four groups profiled in this section include:

- Bowen Island Horse Owners and Riders Association;
- Bowen Island Off road Cyclists Association;
- Bowen Island Museum; and
- Bowen Island Heritage Preservation Association.

We recognize two other groups, the Bowen Island Fish and Wildlife Club, which operates the Bowen Island Hatchery in Crippen Park and the Bowen Island Memorial Garden Society, which maintains a two-acre memorial garden also in Crippen Park. Both organizations are made up of volunteers, although the

Fish and Wildlife Club receives training and the majority of its operating funding from the Department of Fisheries and Oceans Canada (Bowen Island Fish and Wildlife Club 2011).

4.2.1 Bowen Island Horse Owners and Riders Association

Baseline Conditions

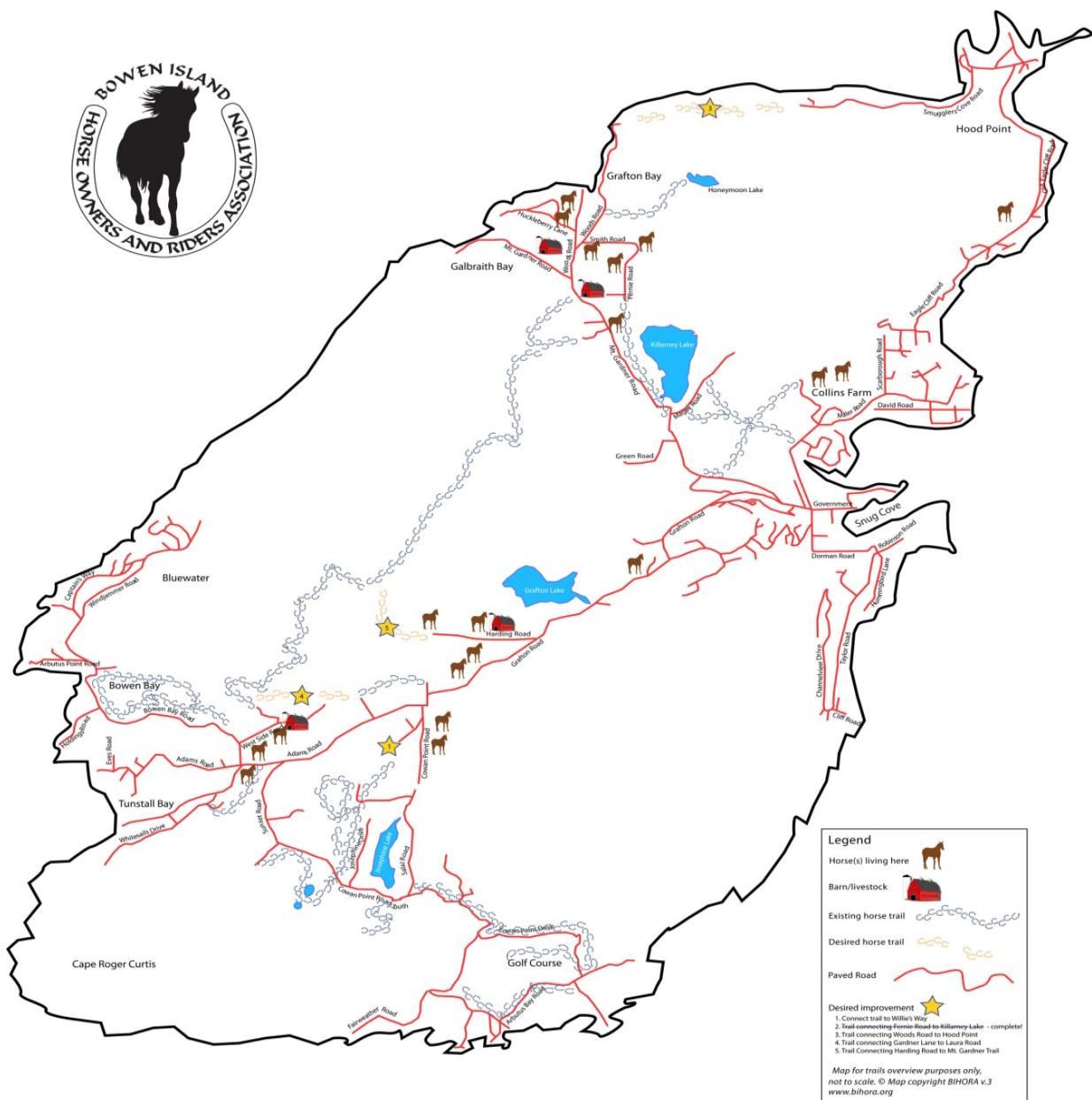
The Bowen Island Horse Owners and Riders Association (BIHORA) was founded in 1983 and represents a number of horse enthusiasts on Bowen Island. As seen in Figure 8, the association uses several trails on the Island and has plans for additional trails in the future. It also maintains the Equestrian Ring (The Meadows) in Crippen Park, which has historically been used for horses and trail rides dating back to the days of the Union Steamship Hotel in the 1920s (Bowen Island Horse Owners and Riders Association 2010).

Collectively the riding trails and riding ring represent a considerable investment of volunteer effort and donated materials to build and maintain. While the Association has been actively participating in building and maintaining the trails and riding ring, others in the community have also been involved, including BIM.

Project Effects Assessment

Portions of the existing trail system fall within the proposed park. Under the administration of Parks Canada, horseback riding on trails would continue to be permitted and Parks Canada would assume responsibility for maintenance. Where trails interact with sensitive ecosystem habitat they may be relocated. The equestrian riding ring (The Meadows) would also fall within the park and Parks Canada would likely issue a License of Occupation to BIHORA for continued use. Assets such as the Riding Ring are common in other National Parks and there is a history of developing these agreements with stakeholders (Bourque 2010, pers. comm.).

Figure 8 Bowen Island Horse Owner and Riders Association Trail Map



4.2.2 Bowen Island Off Road Cyclists Association

Baseline Conditions

There are several recognized mountain biking trails on Bowen Island including (Tourism BC 2010):

- **Quarry Park** which opened in 2005 as Bowen Island's first municipal park. The restored quarry sits at the top of Sunset Road south of Adams Road, near Cape Roger Curtis. It has a shared-use, gravel-based trail that offers a 2 kilometre round-trip with some steep terrain to negotiate.
- **Killarney Lake** provides a 4 kilometre loop shared with hikers and features forested and marshy habitat, as well as a board walk.
- **Mount Gardner** is Bowen Island's highest peak at 762 metres. Bike access to the peak is via an 11 kilometre skid trail but there are multiple bike routes, primarily on the north east side. Numerous man-made structures have been built as well. In total, there are approximately 30 kilometres of single track (Cowan, 2010 pers. comm.).
- **Bowen Island Bike and Skills Park** constructed in 2006 is located in Crippen Regional Park at the south end of Killarney Lake. This community run facility provides mountain bikers with an array of wooden ramps, bridges, and teeter-totters.

Project Effects Assessment

Mountain biking would be allowed in the park, and impacts on the bike community are not anticipated if park use includes existing mountain bike trails and infrastructure. However, it is unclear what trails would be allowed and to what standard the trails would need to meet in order to remain accessible to cyclists (Cowan 2010, Pers. Comm.). This would be a matter of negotiation between the riding community and Parks Canada.

4.2.3 Bowen Island Museum

Baseline Conditions

The Bowen Island Historians have been collecting material related to the history of Bowen Island since 1967 (Bowen Island Historians 2010, Internet Site). They operate two small museums at 1014 Millers Road, and offer historical photos and archives related to Bowen Island's history. There are rotating exhibits on topics like the defunct Western Dynamite Company and Christmas on the Island. The Museum includes Bertie Higgins Logger's Cottage that was built in 1948 and the main museum collection. The museum collection features over 3,000 photographs, artifacts, records of the Union Steamship Company Resort, biographical material and a complete run of the Island newspaper (Province of BC Tourism 2010, Internet Site). The museum typically receives several dozen tourists a day during the summer months but this can vary considerably.

Project Effects Assessment

Increased visitation to the park would also increase to the Museum as visitors take advantage of the interpretation opportunities and close proximity to park facilities. The opportunities for cooperative marketing and programming with the Park would allow the Museum to potentially expand its programming and exhibits and diversify its revenue base.

4.2.4 Bowen Island Heritage Preservation Association

Baseline Conditions

Bowen Island Heritage Preservation Association was formed to save the historic Davies Orchard in Snug Cove's Crippen Park. The lands were destined to be cleared of the cottages that have housed visitors to Bowen Island since the early 1900s. The Orchard, which was planted between 1890 and 1910, had become over grown with native shade trees. In the 1920s the area became a popular tourism destination under the operation of the Union Steamship Company. At its peak, cottages, a hotel, swimming pool and other recreation facilities occupied the site. The Association has worked with the community and Metro Parks to protect and restore the Orchard and its cottages (Gedye 2010, pers. comm.).

Davies Orchard consists of the authentic restoration of four heritage cottages, a careful pruning of a dozen old fruit trees and planting new scions of old varieties. The Association has also developed a small museum in Cottage #10 and a nearby information kiosk about the history of the Union Steamship Company. Also on the Orchard site is a bronze statue of children at play and a demonstration community garden, while Cottage #20 serves as the Association's office. The Association along with partners from other community groups participate in four annual events (Bowen Island Heritage Preservation Association 2010, Internet Site). Part of the Association's vision is to secure financing of approximately \$1 million to upgrade and refurbish the remaining cabins so that they can be rented out to visitors.

Project Effects Assessment

Under the development concept, Crippen Park and Davies Orchard would fall under the administration of Parks Canada. Parks Canada would likely issue a licence of occupation to the Association in order to allow the Association to continue its work at Davis Orchard. There is also the potential for some coordinated planning with Parks Canada that would allow cabin refurbishment and future use for accommodation.

4.3 Infrastructure

The infrastructure addressed in this section includes marine transportation, roads, sewer and water services. The common issue to be addressed is that the infrastructure has capacity that is intended to deliver a target service level to system users. Use levels beyond the capacity of the system may cause a deterioration of services, which at some point would trigger an investment to expand capacity to restore the desired service level. Over time, an expanding population will generally be correlated with an expansion of infrastructure capacity. The effect of the park, as discussed in Chapter 3, will be to increase visitations to Bowen Island and marginally increase the number of permanent residents. The matter addressed here is how this increase in temporary and permanent population might increase the demand for selected services and the need to expand capacity sooner than would otherwise be the case.

The decision to expand capacity will depend on a host of factors including the nature of the infrastructure, the cost of expanding the system, demand management alternatives, and financial constraints of the operator. As well, capacity may be measured by total annual use/consumption, monthly, peak day or even peak hour usage. Depending on which measure of capacity is breached and the “malleability” of the infrastructure, the service provider’s response may differ. For instance, water taxi companies could readily respond to increased demand for their services during the busy summer months if visitation levels warrant. In contrast, in order to meet increase water demand, a system expansion may require considerable forward planning and a substantial investment in new pipe and ancillary facilities. For services on Bowen Island, it also matters where the incremental demand is located since the Island is not served by one unified system.

This assessment uses the available information to characterize the likely development of the respective systems in the absence of the NPR, and given the population implications of the development concept. There are data gaps with respect to characterizing the existing system and future expansion plans as well as specific system demand characteristics of park visitors. Nevertheless, tentative conclusions are drawn, and the decision may be to examine the matter further as the proposal proceeds.

4.3.1 Marine Transportation

Baseline Conditions

Bowen Island is served by BC Ferries (BCF) and two private water taxi operators.

BCF operates year-round ferry service between Snug Cove and Horseshoe Bay (Route 8). It is one of 25 routes for which the company is obligated to provide coastal ferry services. The route is three nautical miles in length with a crossing time of 20 minutes. It is in the Minor Route group, along with 17 other routes.⁵

The vessel Queen of Capilano presently serves Route 8. The vessel's car capacity is 85 automobile equivalents (AEQ) and is licensed to carry up to 457 passengers and crew. Scheduled service is daily and year around. In the 2010 fiscal year, BCF completed a total of 5,563 round trips with a capacity to transport 971,380 AEQs⁶ (BC Ferries, 2010).

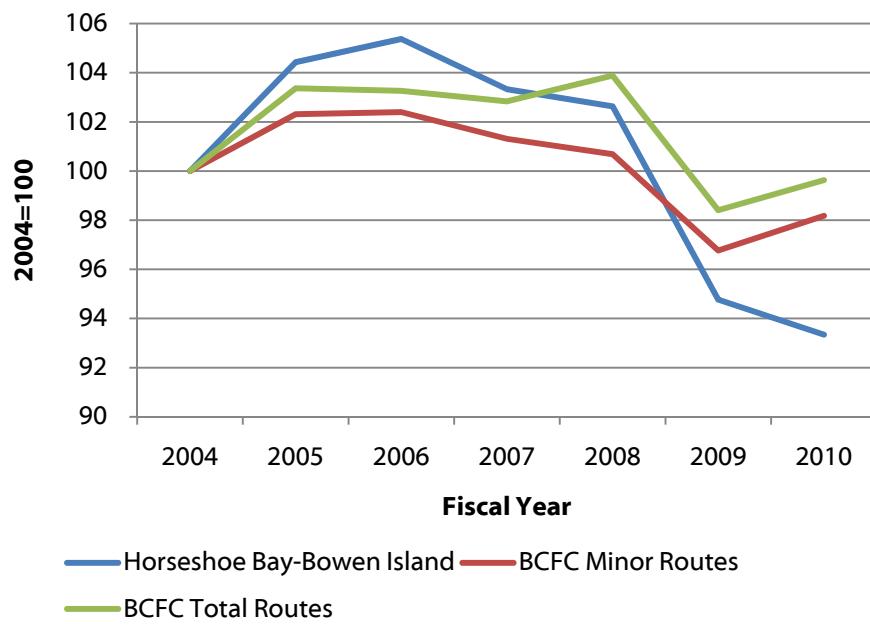
In fiscal year 2010, a total of 497,889 AEQ's and 1.13 million passengers were transported on Route 8 (BC Ferries, 2010). Route 8's traffic flow is the largest of the minor routes. Recent trends in Route 8 traffic and passenger volume is shown in Figure 9 and Figure 10. For comparison purposes, the corresponding trends of all minor routes and the total BCF routes are also shown in the figures. A 2004 base year was adopted and the figures show the change in respective route traffic to 2010.

From 2004-2006, Route 8 showed relatively stronger growth in both vehicle and passenger volumes. After about 2006 all of the indices were either stable or declining, reflecting falling traffic volumes that continued to 2009. Recently, the minor routes and the total system traffic volumes have begun growing, but have yet to return to 2004 values. Route 8 vehicle and passenger indices shows the greatest decline, with 2010 volumes about 6% below the respective 2004 level.

⁵ The other two route groups are Major (4 routes) and Northern (3 routes). BCF provides services under the Coastal Ferry Services Contract with the Provincial government which identifies the routes and the required level of service, among other things.

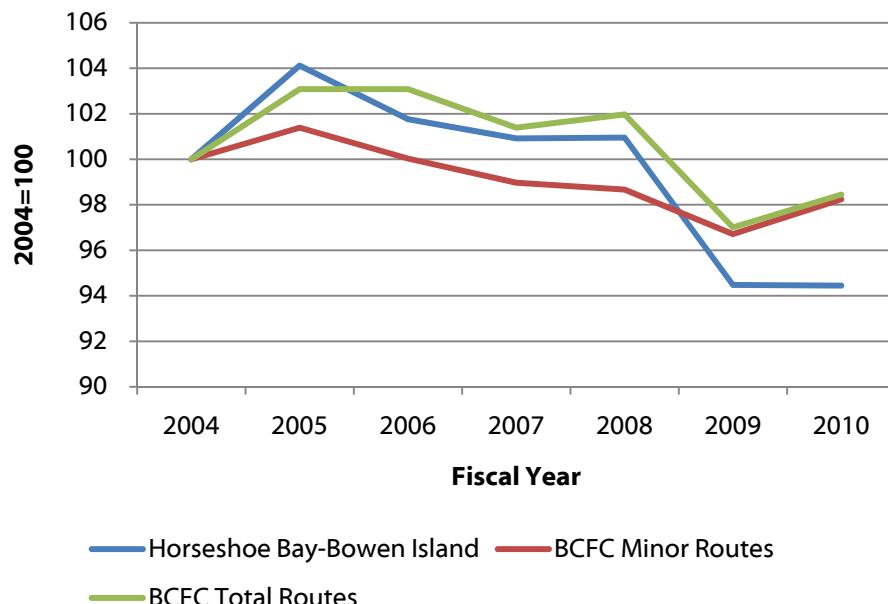
⁶ AEQ is the vessel capacity occupied by the vehicle as represented by the number of under height vehicles it displaces. For example, one bus is equivalent to 3 AEQ's.

Figure 9 Index of Annual Vehicle Traffic, Selected Routes 2004-2010



Source: BCF (2010)

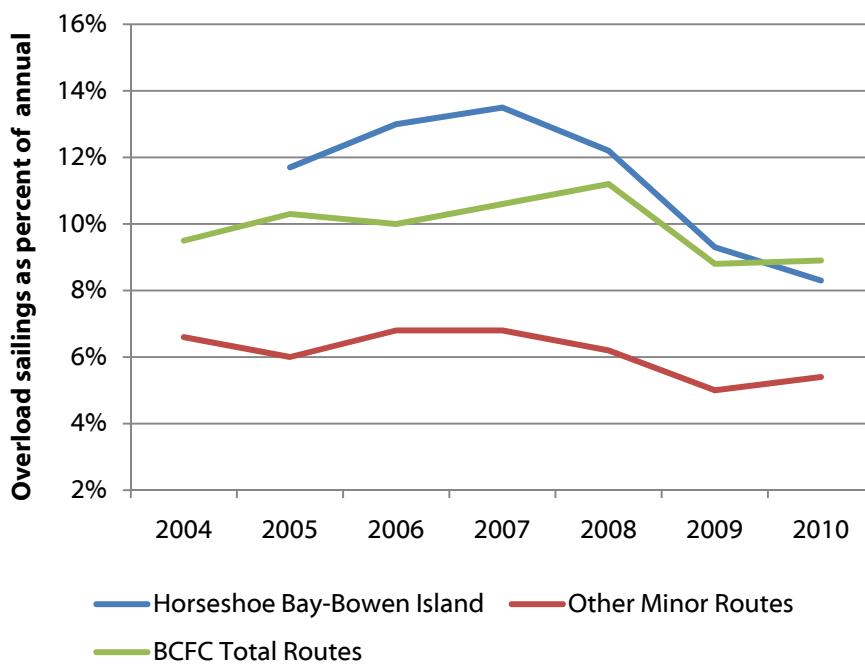
Figure 10 Index of Annual Passenger Volume, Selected Routes 2004-2010



Source: BCF (2010)

On an annual basis, the capacity utilization on Route 8 has ranged between 50% to 58%, which is about average for the BCF system. Nevertheless, the frequency that vehicles are left behind on Route 8 is typically greater than other minor routes, or the BC Ferries' system average (Figure 11).

Figure 11 Overload Sailings As a Percentage of Total Sailings, Selected Routes 2004-2010



Source: BCF (2010)

Another indicator of excess demand relative to route capacity is the number of extra sailing BCF provides on the route in addition to the mandatory number required under contract. In recent years there have been few extra sailings recorded on Route 8. In contrast, Langdale/Horseshoe Bay had 77 extra sailings in 2010 fiscal year. The Denman/ Hornby Island route had the largest number of extra sailing of the minor routes at 274 trips in fiscal year 2010.

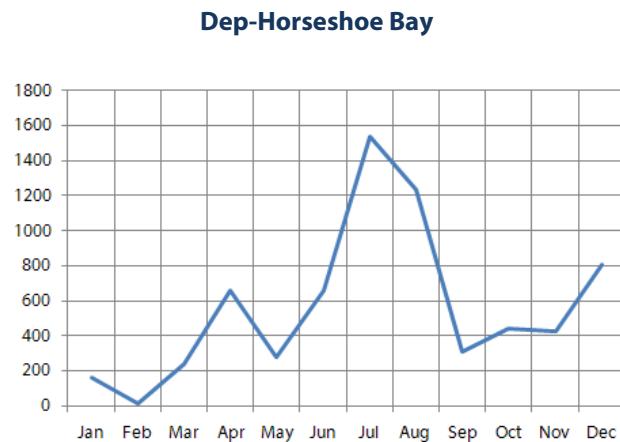
The overload volume on Route 8 is likely attributable to the fact that sailing frequency is already maximized on the route so extra sailings are not possible (Guenette 2010, pers. comm.). Thus, management options for responding to increases in demand appear to be limited to ferry capacity.

The proportion of overload sailings on Route 8 has fallen sharply in recent years, and may be correlated with the decline in vehicle traffic carried on the route.

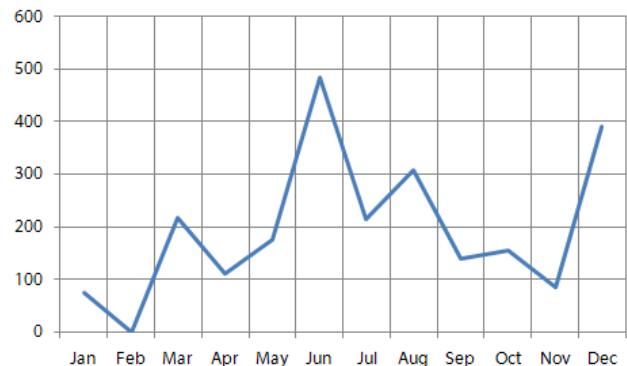
The distribution of vehicle overloads for Route 8 by month, day of the week and hour of the day for the operating year ending in March 31, 2010 is shown Figure 12. The data bear out what most residents already understand about commuter patterns, vehicles volumes and areas of concentrated demand.

Figure 12 Overload Profile for Route 8, April 1 2009 to March 31 2010

Monthly Distribution of Overloads by Number of Vehicles

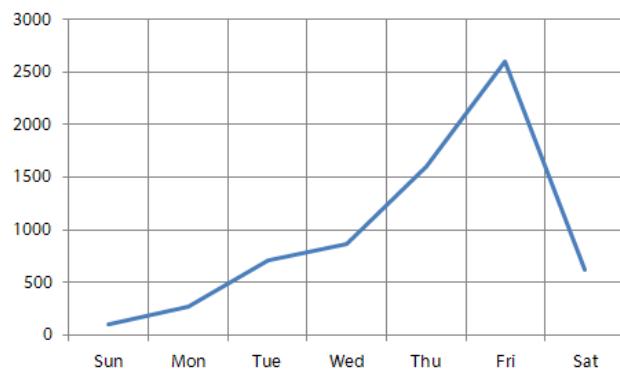


Dep-Snug Cove

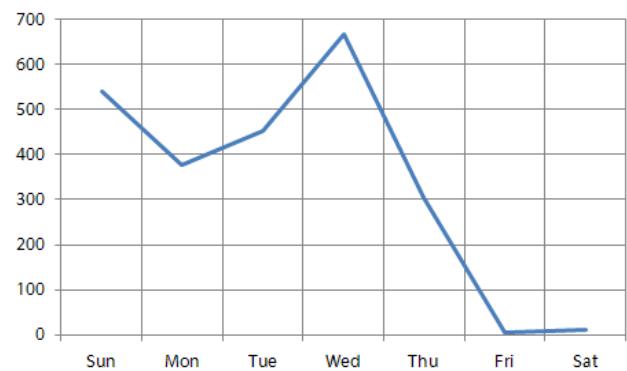


Daily Distribution of Overloads by Number of Vehicles

Dep-Horseshoe Bay

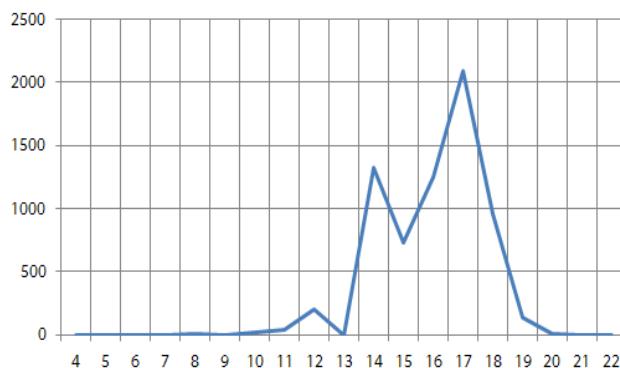


Dep-Snug Cove

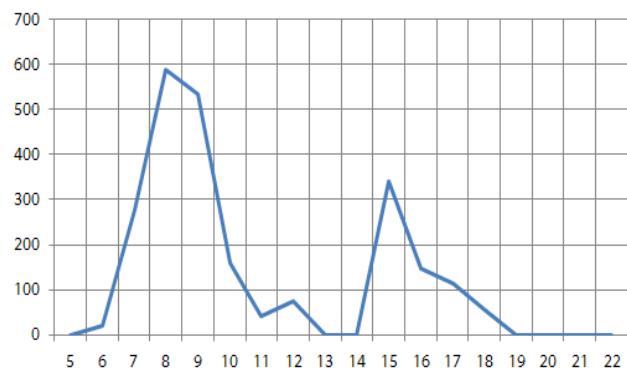


Hourly (24) Distribution of Overloads by Number of Vehicles

Dep-Horseshoe Bay



Dep-Snug Cove



Source: BC Ferries (2010)

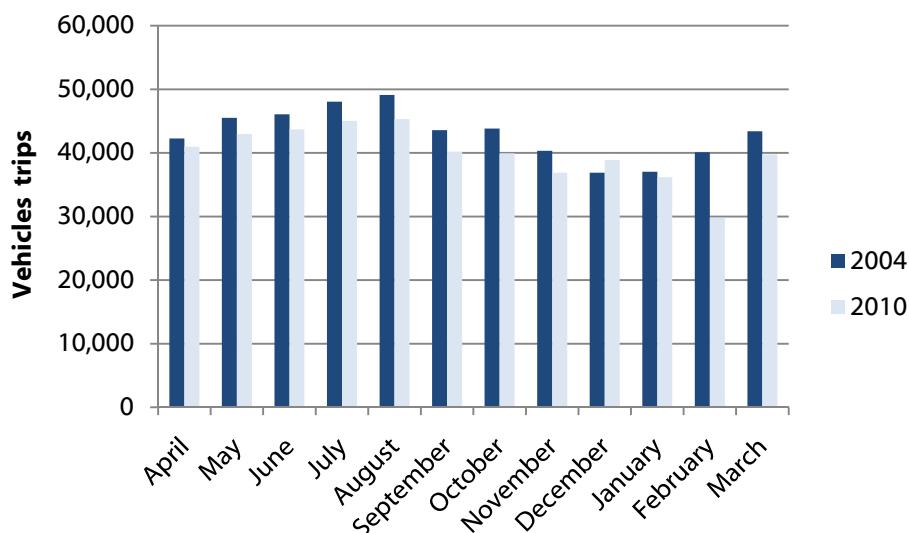
In general overload volumes tend to be much higher, roughly three times, for Horseshoe Bay departures than for those from Snug Cove. The monthly distributions are understandably concentrated in the peak summer months of June and July—overloads from Snug Cove have an additional peak during Christmas/New Year's.

Horseshoe Bay overloads are concentrated on Thursday and Friday, while Snug Cove overloads occur during the Sunday to Wednesday stretch. The Wednesday overloads are likely attributable to backups caused by hazardous goods shipments on the ferry (Morse 2010, pers. comm.).

The hourly overloads at Horseshoe Bay coincide with returning commuters with rush hour peaks between 4pm and 6pm, while at Snug Cove the overloads are in the morning.

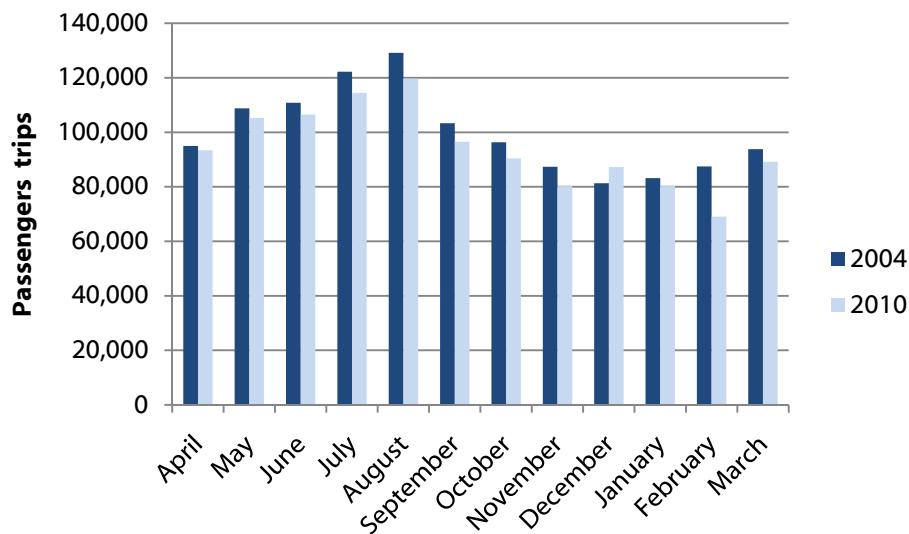
An indication of the seasonal distribution of ferry use is reported in Figure 13 and Figure 14, which summarize monthly statistics for 2004 and 2010. Vehicle and passenger volumes in 2010 are roughly 6% below the corresponding annual values in 2004. This decline is evident in every month except December⁷, suggesting the loss is concentrated in travel not related to seasonal considerations, such as commuting travel, and non-seasonal related travel by Bowen Island residents.

Figure 13 Monthly Vehicle Count on Route 8, 2004 and 2010



Source: BCF (2010a)

⁷ February 2010 vehicle counts are believed to be lower than anticipated due to service changes during the 2010 Olympics.

Figure 14 Monthly Passenger Count on Route 8, 2004 and 2010

Source: BCF (2010a)

Even though ferry traffic to and from Bowen Island is dominated by resident commuter volumes, the vehicle, passenger and overload data do show seasonal patterns, with the peak periods in the summer months when seasonal residents and tourists are more likely to visit. A measure of the degree of seasonality used in traffic analysis is the ratio of August volume to March volume, on the assumption that March represents maximum local volumes without the interference of visitor traffic. This approach is often utilized in traffic studies and is acknowledged as an acceptable methodology for determining non-resident activity by BC Ferries (Guenette 2010, pers. comm.)

The ratio for travel on Route 8 is about 1.15 for vehicles and 1.35 for passengers, which is a moderate seasonal profile. The corresponding passenger ratio for the southern Gulf Islands is around 1.7, indicating a higher proportion of summertime visitors (BCF, 2010a).

Our interpretation of the seasonality exhibited by the BCF data has played a central role in the preparation of the visitation forecasts. Specifically, the data were used to apportion the traffic into regular system users (i.e. mostly BI residents as well as commercial traffic) and visitors to BI. This was done by assuming that March traffic is composed entirely of commuter/BI resident traffic that remains relatively constant throughout the year. The difference between the August and March ridership is interpreted as the number of “visitors” in that month. This value was grossed up to an annual value based on the proportion of August visitors to annual visitors. Rather than one year of data, the base year is the average for the most recent five years of reported arrivals at Snug Cove. Readers should note that in our estimates visitors included day-use, overnight and non-permanent residents.

Given base year estimates of resident and visitor passenger, vehicle and walk-on values, the next step is to forecast future values given reasonable assumptions. The “model” and list of assumptions used in the forecast and the annual forecasted values is presented in Appendix C. Two key assumptions are that the

resident travel is assumed to grow at the same rate as the Bowen Island population⁸, and visitor numbers grow at the rate discussed in Section 3.3 (i.e. at the same rate as projected GVRD population growth). Table 17 highlights the model's results for selected years.

Table 17 Base Case Forecast of Arrivals at Snug Cove (Route 8)

Indicator	Base year	% of base		% of base		% of base	
		year 5	year	year 10	year	year 15	year
Annual Passengers	588,898	613,682	104%	639,721	109%	670,822	114%
Annual Vehicles	255,709	265,815	104%	276,501	108%	289,531	113%
Visitors, Seasonal Residents	68,000	73,500	108%	79,000	116%	84,500	124%
August Vehicles	24,308	25,269	104%	26,285	108%	27,523	113%

The table summarizes a traffic scenario on Route 8 in the absence of the national park proposal. At some point in time the growth would create increased congestion or extended wait times for ferry users. For example, ferry parking advisories in Horseshoe Bay are believed to be increasing in frequency. System performance is monitored by BCF to maintain service according to its contract and the company would be expected to consult with the Bowen Island Ferry Advisory Committee to identify a reasonable response. The current schedule is at maximum frequency and could not be expanded without changes to operating parameters (e.g. longer crew days, increased overtime, increased terminal operating hours). Since overloads are occurring at peak commuter sailing times, extending the operating day would not resolve the issue. A larger capacity vessel would help, but BC Ferries has no plan at this time for a replacement and has not negotiated with the Province for such in the next term of the contract. Increased sailings or a larger vessel would mean increase costs which would have to be offset either by increased fares, increased service fees or a combination of both. Without a service fee increase, BCF would likely resort to fare increases to cover the expected jump in costs. (Guenette 2010, pers. comm.) Other types of demand management measures may also be possible, including fare variations to encourage travel during slack periods and with smaller vehicles. Improved water taxi services could also be explored.

Marine transportation services are also provided to Bowen Island by privately-owned water taxis. These operations fill service niches not served by Route 8, that is, direct passenger service to downtown Vancouver and late night service to Horseshoe Bay. At the time of writing, two operators (Cormorant Marine and English Bay Launch) were making scheduled runs from Snug Cove. Coastal Link Ferries, which had operated a 70-passenger commuter service to Vancouver has ceased operations (Shaker 2010, pers. comm.). Cormorant Marine operates three vessels ranging in size from 12 passenger to 40 passenger vessels. It operates a late-night ferry service to Horseshoe Bay. Its primary clientele is charter

⁸ It is noted that since the Bowen Island population reportedly increased since 2004 while ferry traffic declined, the assumed positive correlation between the two for forecasting future ferry traffic may be questioned. Urban Futures (2008) has noted that the increasing age demographic likely coincides with declining ferry demand due to lower travel commitments. In this context, we feel our projections are conservative, since failing ridership essentially “frees” up capacity within the existing operating parameters hence more easily accommodates potential incremental visits associated with the proposed national park.

work in Howe Sound (Biddlecombe 2010, pers. comm.). English Bay Launch has three vessels and operates its 12 passenger vessel on scheduled service between Snug Cove, Granville Island and Coal Harbour. In the summer period, on average some 150 to 250 passengers are transported, with about three quarters of the passengers being visitors to Bowen Island (Shannon 2010, pers. comm.). The operators indicated that their ridership was seasonal and they adjusted sailings, scaling back sailings in the non-summer months and using smaller vessels in an effort to maintain financially viable operations.

In Snug Cove, there are three marina's providing moorage to private and commercial boaters. Two are private facilities and the third is operated by BIM. Visiting vessels may also anchor in Mannion Bay (adjacent to Snug Cove) and use a small boat to access the docks.

The Union Steam Ship Marine Resort is the largest of the three, having about 190 moorage slips. About 60 slips are available in the summer season (May 1 to October 15) for day and overnight visitors. During the prime boating season, most of the overnight slips are occupied on the weekends and holidays, but typically space is available during the week (Dyke 2011, pers. comm.). The Bowen Island Marina is smaller, with 45 slips. All of the moorage space is permanently assigned, however a relatively small volume of overnight moorage is made available when the permanent tenant is away. This may result in the order of 30 overnight visitors per year (Dallas, 2011, pers. comm.). The BIM has 600 feet of dock space, with about 450 feet available from September 15 to May 15 for day and overnight visitors, or roughly 12 to 15 vessels (Zimmerman, 2011, pers. comm.). Typically, most of the slips are occupied in the summer period. In 2010, about 2, 000 daytime visits and 370 overnight visits were recorded. (Buchanan, 2011, pers. comm.) The private water taxi's also land at the BMI dock. BMI also operates dock space (Mt. Gardner dock) in Galbraith Bay offering monthly moorage only.

Effects Assessment

Visitors to the NPR will include Bowen Island residents, visitors that would have visited Bowen Island in any case (i.e. "base case" visitors), and those that come to Bowen Island because of the NPR (i.e. incremental or new visitors). In terms of the NPR's effect on marine transportation services, it is only the incremental visitor that will create demand as compared to the base case forecast. For the purposes of the forecast, it was assumed that no incremental visitors would walk on the ferry. This maximizes the number of vehicles attributed to the NPR and therefore represents a "worst case" scenario.

The forecast of incremental visitors (over night and day use) was summarized for selected years in Chapter 3 (Table 14). The corresponding increment to ferry traffic (passengers and vehicles) is summarized in Table 18 with the complete results appearing in Appendix C. The tables show the absolute increase, and how much the increase attributed to the NPR adds to the increment expected to occur without the NPR (i.e. the base case). This is an important benchmark since it defines the magnitude of the effect of the NPR , relative to the general growth expected.

Table 18 Contribution of National Park Visitors to Base Case Arrivals at Snug Cove

Increment Arrivals at Snug Cove	year 5	change from base case	year 10	change from base case	year 15	change from base case
Low						
Annual Passengers (persons)	1,838	7.4%	1,985	3.9%	2,127	2.6%
Annual Vehicles (vehicles)	750	7.4%	810	3.9%	868	2.6%
August Vehicles	201	20.9%	217	11.0%	232	7.2%
Visitors by private vessels	180	7.1%	190	7.0%	210	7.2%
Number of Vessels	60	7.1%	63	7.0%	70	7.2%
Medium						
Annual Passengers (persons)	3,938	15.9%	4,253	8.4%	4,557	5.6%
Annual Vehicles (vehicles)	1,607	15.9%	1,659	8.0%	1,710	5.1%
August Vehicles	430	44.8%	417	21.1%	430	13.4%
Visitors by private vessels	380	15.1%	410	15.1%	440	15.0%
Number of Vessels	127	15.1%	137	15.1%	147	15.0%
High						
Annual Passengers (persons)	6,564	26.5%	7,089	13.9%	7,596	9.3%
Annual Vehicles (vehicles)	2,679	26.5%	2,893	13.9%	3,100	9.2%
August Vehicles	717	74.7%	775	39.2%	830	25.8%
Visitors by private vessels	630	25.1%	680	25.0%	730	24.9%
Number of Vessels	210	25.1%	227	25.0%	243	24.9%

For the purposes of this discussion, we will focus on Year 5 because the major jump in demand will occur during the early years of park operation. The increments to the baseline shown in Table 18 are much greater in Year 5 than in years 10 and 15. Therefore, it is during the early years of park establishment that a service response, if any, would be required.

In our low visitor estimate, the NPR might be expected to add 1,838 passengers and 750 vehicles, 7.4% more than the baseline. But because these trips are concentrated in the summer tourist season the increment to August demand will be much greater, 20.9%. Looked at another way, for every four vehicles that the system will have to carry in the baseline (i.e. without the park), a fifth vehicle would be added. The corresponding increments are roughly two for every four vehicles in the medium estimate and three for every four vehicles in the high estimate.

In reviewing baseline conditions, it is apparent that the timing and not the magnitude of demand will drive the effects on ferry service. The overload data in Figure 12 shows that if incremental demand appears during peak periods it will result in more overloads and potentially induce a change in service levels sooner than would occur in the base case. In this event, the real effect of the park is to bring demand forward in time, thus prompting a service response from BCF and the provincial government sooner rather than later. As already discussed, this might be through increased vessel size, demand management measures or efforts to increase complementary services such as water taxis. Any response in ferry service would need to be jointly agreed to by BCF and the provincial government, according to their service contract.

However, if demand occurs outside of peak periods, then the effects on commuters would be more manageable. For example, there is capacity available on the morning sailings between Monday and Friday for Horseshoe Bay departures and afternoon sailings between Monday and Friday for Snug Cove departures. Since the majority of new visitors are expected to be day users, it could be argued that the incremental demand for ferry service would run counter to commuter flows and thus avoid peak periods and overload conditions.⁹ Overnight visitors might still contribute to overloads if they coincided with commuter runs or during busy weekend periods.

The two water taxi operators felt it likely that the NPR would increase their summer passenger volumes, but they did not feel sufficiently informed about the NPR to estimate how substantial the growth might be. Nevertheless, they indicated they could use larger vessels and increase sailings to meet the likely increase in visitation that may arise with the establishment of the NPR.

The number of visitors arriving by private boat is expected to comprise a relatively small proportion of those electing to visit the Island and the NPR. Our discussions with the three marina's operating in Snug Cove indicated that on summer weekends typically all available overnight slips are occupied. However, moorage space is generally available during the week, perhaps in the order of 20 slips per night (Dyke 2011, pers. comm.). This is sufficient capacity to accommodate the increment in boaters if timing of the visit is diverted to the week day periods. Alternatively, measures to accommodate the increment may include improved efficiency (e.g. reservation system, rafting) as well as vessels anchoring in Mannion Bay.

4.3.2 Roads and Traffic

Baseline Conditions

The Public Works Department of BIM is responsible for the operation and maintenance of the municipal roads on Bowen Island. It maintains surface drainage systems such as ditches and storm sewer inlets. In some areas, roads are owned and maintained by private Strata corporations or private businesses or individuals.

The public road infrastructure consists of:

- 70 kilometres of paved primary roadways
- 60 kilometres of paved secondary roadways
- other unpaved roads (5 km) unmaintained road right of ways

Roads are maintained through a regular program that includes pothole patching and pavement repairs, vegetation slashing, sidewalk and sign maintenance. BIM has a schedule of maintenance for the roads it has responsibility for. There are no vehicle restrictions on the roads that would affect visitors - the restrictions on Bowen are related to single lane and rough conditions as one gets away from main roads and depending on eventual park entrances these types of roads would need improvement.

⁹ Sailings during dangerous cargo shipments on Wednesdays would be an exception.

For example, two roads, Mount Gardner Road and Miller Road, represent the two key access routes to Crippen Park. Currently Mount Gardner Road has narrow or no gravel shoulder and no designated walking or cycling path. The road is also used by equestrians. The current road configuration is already somewhat dangerous and equestrians rely heavily upon care and attention of motorists. Miller Road has a walking path on the east side of the road but there are no vehicle pull-outs between Snug Cove and Crippen Park and the route is too narrow to adequately accommodate cyclists.

Based on the results of radar traffic monitoring data collected between February 22 and March 9, 2010 on Miller Road near Melmore Road, an average of 1,900 vehicles a day pass this point in both directions (Hilsen 2010, pers. comm.). This monitoring site is located approximately 75 metres north of the Crippen Park parking lot.

Traffic congestion on the Island roads mostly occurs at Snug Cove related to vehicles arriving or departing by ferry added to General Store, Village Square, school and commuter traffic. On street parking in the Snug Cove area (i.e. free for a given time period) is at a premium most days during business hours, on the weekend in the summer it is very scarce. The municipality is investigating options and strategies to address this congestion (Ferry Marshalling Study). Parking around beach accesses and trail entrances generates some crowding during better weather at typical recreational hours (i.e. summer weekends, etc.).

Effects Assessment

The effect of the NPR would be to advance road maintenance, or upgrades to a higher standard, on municipal roads that are linking to the NPR or its facilities. For now, roads do not conform to any consistent standards and would undoubtedly require enhancements to accommodate ingress, egress, parking, overflows, roadside trails and the like. The significance of this effect will become more evident as planning proceeds on the NPR.

The second primary impact of the NPR is the added visitor traffic on Bowen Island's roads. Estimates of the incremental arrivals of visitors in cars at Snug Cove was presented in Table 18. In the context of total traffic volumes, both on the ferries and on local roads, the increments are small. If all projected incremental vehicles in the peak travel month of August in Year 5 were put on Miller Road, it would represent a 1.0% to 1.5% increase over and above current volumes.

While the magnitude of the effect appears small, there may be specific locations and certain times of the day when congestion and safety concerns may exceed base case conditions, in which case it may be necessary to mitigate issues through the appropriate traffic management tool (e.g. traffic control, left and right turn lanes, lane widening, widened shoulders).

Another issue is parking at Snug Cove by vehicles waiting for the ferry, conflicting with other traffic, pedestrians and detracting from the ambience of the village. While incremental park visitors arriving by vehicle exacerbate this issue, the contribution to baseline traffic in August, the peak visitation time, is between 200 and 700 vehicles per month.

Parking at Horseshoe Bay will also be an issue. In the summer of 2010, three "no parking available" advisories were issued by BC Ferries. An increase in the number and length of the advisories, especially

where they might coincide with overload sailings to Snug Cove, would be inconvenient and increase travel costs for visitors and residents.

The community will need to look at strategies for reducing the parking conflicts at Snug Cove with or without the NPR. The traffic contributed by the NPR is not large when compared to the base case, but if it occurs at existing peak congestion periods, then mitigation measures such as encouraging visitation to avoid peak congestion and by encouraging walk-ons would have to be considered. However this also depends on having parking available at Horseshoe Bay and convenient transit service on Bowen Island. A parking plan by Parks Canada and BIM that integrates Snug Cover, Crippen Park and other expected areas of use should also be prepared.

4.3.3 Water and Sewer System and Distribution

Baseline Conditions

Bowen Island Municipality reportedly has 38 km of water lines. Approximately half of Bowen Island homes are served from a municipal water system, with the remainder supplied by private communal water systems or utility, shared or individual wells. Other than as set out above, community systems are administered privately. The NPR is not expected to affect the privately operated systems, consequently they are not considered further here. The implications of the proposed NPR on watershed protection and water quality to satisfy existing user and OCP build-out requirements is not known at this time but would be addressed in the environmental assessment.

BIM owns and operates seven water systems situated around the Island, serving approximately 1,000 connections. The water systems listed on the municipality's website are listed below: (BIM, 2010)

- King Edward Bay Water System
- Blue Water Park Water System
- Bowen Bay Water System
- Cove Bay Water System
- Eagle Cliff Water System
- Hood Point Water System
- Tunstall Bay Water System

Among these water systems, the NPR is most likely to affect Cove Bay. The Cove Bay water system serves the Snug Cove area and has about 680 attachments. Most of these are private residents and some commercial establishments. There are plans to expand the system to accommodate the addition of about 100 new attachments over the next ten years. The cost of the expansions is estimated to be about \$4 million (Mahood 2010, pers. comm.).

BMI operates a sewage treatment and disposal system servicing the Snug Cove area only. It presently serves about 100 homes. This system is being upgraded to tertiary treatment and a tripling of the existing capacity (Hilsen 2011, pers. comm.).

Effects Assessment

The direct effect of the NPR on Bowen Island's water and sewer system would most likely be via the increased use of commercial establishments in the Snug Cove area. The high visitor estimate in particular may increase demand for water and waste disposal systems, but these could be accommodated by independent systems depending on the location of demand. For the purposes of this assessment, it is assumed that the NPR incremental demands on the Snug Cove water and sewer systems would be in proportion to the increase in tourist expenditure on Bowen Island.¹⁰ The estimate of economic impacts presented in the baseline indicate annual visitor expenditures of \$2.8 to \$3.6 million over 15 years (Table 12). Incremental spending varies with the low, medium and high visitation estimates (Table 15), ranging from roughly 3% of the baseline expenditure to 12%. An increase of this magnitude by commercial establishments, which make up a relatively small share of the system use, would not be expected to accelerate or modify BIM's current plans for expanding the respective systems. System capacity needs are driven primarily by domestic requirements and fire flows, and the influence of visitors on these factors would be too low to change design requirements (Mahood 2010, pers. comm.).

There is no water system that would be directly affected by NPR within the existing parkland. There is a right-of-way through Mount Collins provincial lands for the supply piping for the Hood Point system.

It is not known at this time if there would be any specialized NRP facilities away from the Snug Cove area or if there would be an impact on water or sewage system requirements.

4.4 Other Public Services

The public services addressed in this section include Bowen Island administrative services and planning, policing, ambulance, and fire and rescue services. These services are considered as they may experience a change in demand or operating procedures if a National Park is established on Bowen Island. At issue is whether park visitor or new resident use of services will exceed current capacity, potentially causing a deterioration service quality or trigger an investment to expand capacity. In addition it is also important to begin to understand how the resources provided by Parks Canada to administer and manage the National Park would interact with those services already in place.

4.4.1 Municipal Administration

Baseline Conditions

BIM staff compliment in 2009 was 27 full-time equivalents, comprised of 35 persons with several working seasonally or part time. Within this staff complement are 2.5 full-time equivalents dedicated to administrative support (Mahood 2010, pers. comm.). In 2009 BIM collected revenues of just over \$6.6 million (Ministry of Community, Sport and Cultural Development, nd).

¹⁰ This overstates the likely effect since the expenditure by Bowne Island residents in Snug Cove commercial establishment is not included, hence their contribution to system demand is attributed entirely to visitors.

Effects Assessment

It may be the case that establishment of a National Park will generate new administrative work for the BIM as it engages with Parks Canada. Park planning work to this stage has involved both Council and staff time. Given this, it is reasonable to expect additional BIM resources will be needed, but the requirements are not known at this time. If the proposal proceeds, this matter would be addressed by Parks Canada, which is presently estimated at \$55,000 annually to offset potential added administrative responsibilities.

4.4.2 Policing Services

Baseline Conditions

Policing services are provided by a RCMP detachment based on Bowen Island. The detachment consists of three officers. Policing strength and case load statistics for the years 2004 through 2009 is summarized in Table 19. Case loads per officer on Bowen Island are well below the GVRD average of 53.

Table 19: Bowen Island Policing Strength and Crime Numbers, 2004 to 2009

	2004	2005	2006	2007	2008	2009
Policing Strength (officers)	3	2	2	3	3	3
Case Load per Officer	43	75	62	36	44	43
Total Number of Criminal Code Offences	128	149	123	108	131	129
Number of Drug Crimes	6	10	8	2	10	7
Number of Assaults (note 1)	4	11	3	10	8	11
Motor Vehicle Theft	3	3	2	7	5	4

Source: Ministry of Public Safety and Solicitor General (nd)

Note 1: Included in total criminal code offences.

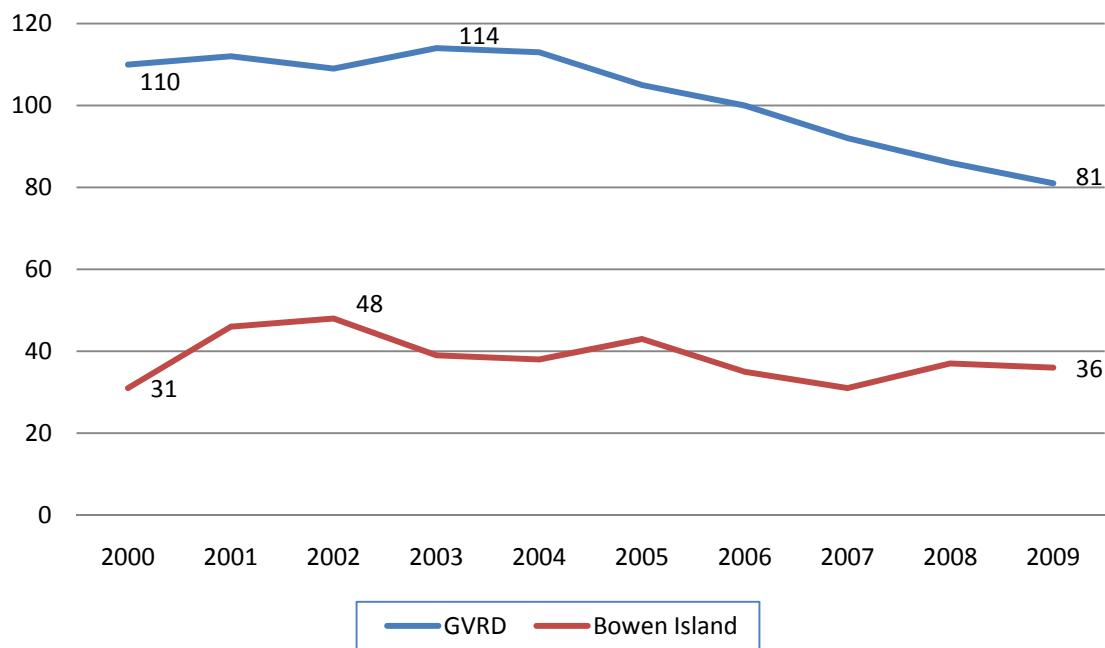
Figure 15 shows crime rates for Bowen Island and the GVRD between 2000 to 2009. The rate is defined as the number of criminal code offences per 1,000 population. Over the period Bowen Island has experienced much lower crime rates than the GVRD. Bowen Island's low crime rate may be attributed to its demographic profile, its visitor profile and to the fact that it is a small Island community.

Effects Assessment

The volume and characteristics of incremental visitors to the National Park would likely determine the impacts on police workloads and crime rates. The visitor forecast indicated that The NPR would bring in new visitors but the increments are minor compared to the base case and the prevailing demographic characteristics are not expected to change. Consequently significant effects on policing requirements or crime rates is not expected. Nevertheless, to the extent there is some increase in policing cost, Parks Canada is obligated to negotiate agreements with the RCMP to address the effect.

It is also noted that the Park Warden would enhance policing capabilities, addressing issues related to alcohol-related, anti-social behaviour among young adults in the park (Southern 2010, pers. comm.).

Figure 15 Crime Rates for Bowen Island and GVRD, 2000 to 2009



Source: Ministry of Public Safety and Solicitor General (nd)

4.4.3 Ambulance Service

Baseline Conditions

The British Columbia Ambulance Service (BCAS) maintains one ambulance (Station 225) staffed by paid on-call paramedics. The paramedics are from the Mainland and travel to the Island to be available for their on-call shifts (Biddlecombe 2010, pers. comm.).

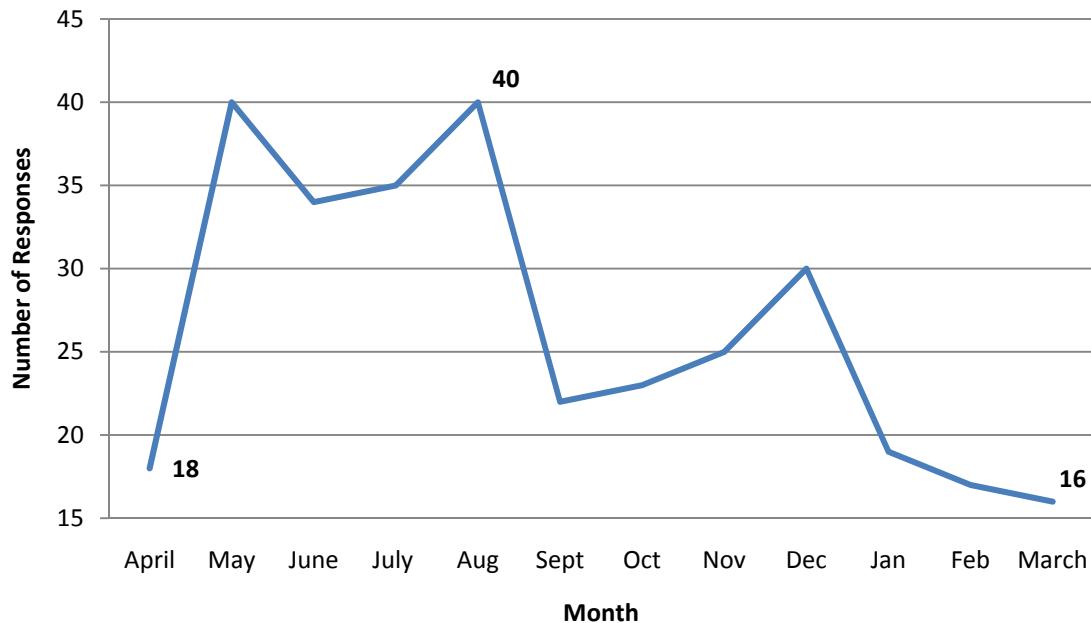
When patients require transportation off the Island the mode of travel will vary according to the severity of the injury or medical condition. The majority of routine calls have patients escorted by paramedics on a passenger-only water taxi from the government dock in Snug Cove to the government dock in Horseshoe Bay. From here, the patient is transferred by ambulance to hospital.

In a small number of cases, the ambulance will travel by BC Ferry from Snug Cove to Horseshoe Bay, where patients are again transferred to a waiting ambulance. More serious injuries or incidents may require an air ambulance for transfer to the nearest trauma centre (usually Vancouver General) (Scab 2010, Internet Site). There is no designated helicopter landing site on Bowen Island for air ambulance evacuation but several helicopter land sites are used for air evacuation to the mainland. The landing site used for a specific evaluation is selected by the helicopter pilot (Chick 2011, pers. comm.).

In the most recent fiscal year, the BCAS responded to 319 calls on Bowen Island, with the busiest period being between May and August. Calls between January and April make up less than half the number of

calls in August (Figure 16). In addition, 55% of the calls typically occurred during the weekend. Since 2006, the ambulance call outs have been rising by about 5% per annum (Chick 2010, pers. comm.).

Figure 16 Bowen Island Ambulance Responses for Fiscal Year 2009/2010



Source: BCAS (2010)

Effects Assessment

BC Ambulance Service has the flexibility to allocate an additional car to Bowen Island if required. This already happens in the Lower Mainland for special events such as concerts or festivals that draw large crowds that may require additional ambulance services. For Bowen Island, ambulance calls are growing at about 5% a year with demand concentrated in the summer months. With a growing resident and seasonal population, Bowen Island will require additional resources even without the park (Chick 2010, pers. comm.).

4.4.4 Fire Department

Baseline Conditions

The Bowen Island Municipality maintains an active fire department, consisting of a full-time fire chief and approximately 30 volunteer firefighters. It operates two water pumper trucks and one rescue truck. The fire department can access almost all areas of the Island in 20 minutes or less. In addition, the municipal fire department works closely with provincial fire services on fires on Crown land and park areas (Biddlecombe 2010, pers. comm.).

Between 1950 and 2005 there have been 124 fires on Bowen Island, of which 106 (85%) were human-caused and the remaining 18 (15%) caused by lightning strikes. All but one of the fires was smaller than

four hectares. The largest fire occurred in 1990 and was caused by lightening, burning an area of 6.5 hectares (B.A. Blackwell and Associates Ltd. 2007). Table 20 summarizes fire occurrences and their cause between 1950 and 2005.

Table 20: Summary of Fire Causes on Bowen Island (1950 to 2005)

	Lighting		Human Caused		Miscellaneous		Total
1950 – 1959	2	9%	18	82%	2	9%	22
1960 – 1969	1	3%	31	84%	5	14%	37
1970 – 1979	3	14%	16	73%	3	14%	22
1980 – 1989	1	5%	17	85%	2	10%	20
1990 – 1999	11	58%	7	37%	1	5%	19
2000 - 2005	0	0%	3	75%	1	25%	4
Total	18		92		14		124

Source: B.A. Blackwell & Associates Ltd. (2007)

Note 1: Miscellaneous fire causes refers to fires that were not determined or burning of building.

The Bowen Island volunteer fire and rescue department is also involved in a range of emergency rescues, search and rescues, and public assistance requests. Table 21 shows annual call-outs ranging from 133 to 168 between 2005 and 2009. Over half (58%) are medical responses and 7% have been associated with motor vehicle accidents and search and rescue assignments.

Table 21 Bowen Island Volunteer Fire and Rescue Call Outs, 2005 to 2009

Type of Call	2005	2006	2007	2008	2009
Medical	114	93	84	69	89
Motor Vehicle Accident	7	13	6	11	7
Lines Down	3	8	10	2	2
Search & Rescue	2	3	1	2	4
Public Assistance	3	9	2	2	5
Hazardous Material Response	0	0	0	0	1
Structure/Chimney & Vehicle Fires	7	7	6	8	11
Smoke Investigation	7	2	2	10	5
Illegal Burning	4	6	3	3	18
Boat Fires	1	0	2	1	0
Brush Fires	0	2	1	7	7
Miscellaneous Fires	8	3	16	8	7
Alarms	6	16	14	10	12
	162	162	147	133	168

Source: Bowen Island Municipality (nd.)

Effects Assessment

The establishment of the NPR could create new demand for firefighting services on Bowen Island from two principal pathways: forest and brush fires and search and rescues.

The effects of forest and brush fires are expected to be minimal, given that Parks Canada would be following or improving on current fire prescriptions and implementing interface fire hazard reduction efforts.

The incremental park visitors could create new demand for the Bowen Island fire department as they respond to more search and rescue and medical assistance call-outs. Even though the magnitude would likely be minor, handling new demand could become a challenge given that the fire department is a volunteer organization (Biddlecombe 2010, pers. comm.).

4.4.5 Solid Waste and Recycling

Baseline Conditions

BIM contracts with Bowen Waste Services to provide weekly residential garbage pickup. Private businesses with excess waste volumes are serviced by private contractors. All garbage collected is transported to the Greater Vancouver Regional District's North Shore Transfer Station.

Bowen Island Recycling Depot has been in existence for 20 years and is operated by volunteers. It is located on Mt. Gardner Road and is surrounded on three sides by Crippen Regional Park. The municipality collection system transfers approximately 700,000 kilograms of garbage and 250,000 kilograms of recycling annually from Bowen Island to the Lower Mainland (BIM 2010).

Effects Assessment

Economic impacts on solid waste services for Bowen Island residents are not anticipated. Parks Canada would make arrangements with the existing network of private contractors to have solid waste generated from the Park removed. There is concern that Parks Canada might include the Recycling Depot inside the Park boundaries; however, this has not been indicated by Parks Canada and would not happen without the appropriate consultations with BIM.

4.4.6 Health Care Services

Baseline Conditions

Health care services for Bowen Island are delivered through Vancouver Coastal Health Region with most facilities located on the mainland. Some programs and services are provided via mobile bases within the community. The community is also served by two family physicians and one office provides portable lab services and electrocardiography services one day per week.

A community volunteer operates the Equipment Loan Cupboard which gives residents access to equipment such as wheel chairs and crutches. There is one senior housing facility on Bowen Island, the 19 unit Bowen Court Seniors Housing Co-op (Bowen Island Municipality 2009).

Effects Assessment

The proposed NPR is not anticipated to create additional demand for health care services because only marginal population impacts are anticipated. Incidental demand for emergency health services that are not available on-Island may be required by day and overnight visitors.

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5.3 Personal Communications

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Katherine Beaulieu, Bowen Island Horse Owners and Riders Association, telephone interview, November 19, 2010.

Brian Biddlecombe, Cormorant Marine / Bowen Island Fire Department, several telephone discussions
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Wayne Bourque, Parks Canada, Gulf Islands National Park Reserve, telephone discussions and email
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Chris Buchanan, Bylaw Services Supervisor Bowen Island Municipality, telephone discussion, January 28, 2011.

Richard Chick, BC Ambulance Service, telephone interview, December 9, 2010, follow-up e-mails.

Norma Dallas, Manager, Bowen Island Marina, telephone discussion, January 27, 2011.

Dorothy Dike, Owner, Union Steamship Marine Resort, telephone discussion, January 28, 2011.

Dan Cowan, Bowen Island Off Road Cycling Association, email communications Dec ember 8, 2010.

Judi Gedye, Bowen Island Heritage and Preservation Association, telephone discussions November 18 and 19, 2010.

Darin, Guenette, Public Affairs Manager, BC Ferry Corporation, telephone discussions and emails,
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Wil Hilsen, Bowen Island Municipality, telephone discussion, December 6, 2010 and January 19, 2011.

Doug Hooper, Bowen Island Municipality, kickoff meeting, October 8, 2010.

Bruce Howlett, private citizen, personal meeting on November 3, 2010 and subsequent emails.

Jon, Kittmer, BC Parks, telephone discussions and emails October 25 and November 3, 2010.

Graham Lamb, Parks Canada Georgian Bay Islands National Park, telephone interview, November 3, 2010.

Steve Langdon, Parks Canada, personal meeting, November 24, 2010.

Brent Mahood, Bowen Island Municipality, kickoff meeting , October 8, 2010 and telephone discussions, November 18, 2010.

Alison Morse, Bowen Island Municipality, Telephone discussions and emails, November 5 to November 15, 2010.

Erin O'Brien, Tourism BC, email, October 19, 2010.

Laurie Peerenboom, Parks Canada GINPR, telephone discussion and email, October 26, 2010.

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Paul Rickett, Bowen Island Chamber of Commerce, personal interview, October 25, 2010.

Ehab Shaker, Coastal Link Ferries, telephone interview, October 14, 2010.

Mike and Wendy Shannon, English Bay Launch, telephone interview, October 14, 2010.

Don Southern, RCMP Bowen Island Detachment, telephone interviews, November 10 and 11, 2010.

Hap Stelling, Bowen Island Municipality, telephone interview, November 9, 2010.

Kristen Watson, Bowen Island Municipality, telephone discussion, November 10, 2010.

Dave Zevick, BC Parks, telephone discussion and email, October 18, 2010.

Silvaine Zimmerman, Wharfinger, BIM, telephone discussion, January 27, 2011.

Appendix A Park Capital and Operating Impact Methodology

Parks Canada's estimates of proposed capital and operating spending on the park were noted in Table 10, while the associated employment and employment income impacts were presented in Table 11. The key assumptions in determining the impacts were as follows:

- Capital investment is assumed to be expended evenly during the first five years of development and operation.
- Average before-tax earnings for parks personnel were taken from Parks Canada estimates for park operations.
- Average before-tax earnings for construction workers (\$47,790) was derived from Statistics Canada average weekly earnings survey, while all indirect employment earnings were based on an average non-basic wage of 28,000 (Horne 2009), updated to 2010 using the BC Consumer Price Index. The 2010 wage is \$29,088.
- After-tax employment incomes were converted from before-tax incomes using methodology recommended by Horne (2009).
- The high, medium and low estimates of local impacts were based on two variables, as follows:
 - Percent of Bowen Island businesses capturing construction spending and operating expenditures by Parks Canada—high (60%), medium (50%) and low (40%); and
 - Percent of Bowen Island residents capturing employment opportunities—low (65%), medium (75%) and high (75%).
- The indirect employment multiplier for all parks-related employment is 1.11 (Horne 2009).
- Direct construction jobs were estimated using expenditure multipliers from the BC Input-Output tables (Horne 2008).
- The indirect employment multiplier for all construction employment is 1.28 (Horne 2009).

Appendix B Visitor Projection and Tourism Impact Methodologies

This section outlines the methodology and assumptions used to make park visitor projections, as well as tourism impacts.

The following factors were considered in estimating visitor projections:

- The development of park infrastructure would likely happen gradually over time. For capital invested in establishing the park we have assumed a five year build-out.
- Visitation is generally correlated with the amount of infrastructure and services available within a park. In the federal and provincial park systems, parks with the highest attendance have purpose-built facilities and amenities meant to cater to these visitors, although access to complementary services in neighbouring communities is also a factor. Conversely, remote and wilderness parks with little to no development tend not to attract high attendance.
- Based on the experience of the BC and Canada park systems, new parks do not generate attendance spikes in their initial years but experience a gradual increases in the number of visitors as they achieve build-out of the development concept.
- Visitor projections are inherently uncertain because they are dealing with the future and with macro variables that are almost impossible to predict with confidence, such as resident travel trends, the value of the Canadian dollar and international border entries.

Baseline Methodology

1. Baseline estimates of the number of visitors to Bowen Island were derived from BC Ferries traffic data for Route 8. A description of this methodology is provided in the ferry transportation baseline section 0.
2. Visitors are assumed to include seasonal residents who may maintain a secondary residence on the Island but would have their primary place of residence elsewhere. Based on our interpretation of ferry data we estimate that seasonal residents account for about 15% of all visitor traffic.
3. The proportion of day-trip to overnight visitors was based on data from the Bowen Island Visitor Centre for the 2008-2010 period, which showed 84% of visitors were there for the day only.
4. Daily expenditures for day (\$39) and overnight (\$62) visitors were taken from a 2008 visitor exit survey of Sunshine Coast visitors conducted by Tourism BC (Tourism BC February 2009). The recent vintage of the survey and the fact that it focused on close by, predominately ferry-based visitor travel destination was considered a fair representation of the Bowen visitor experience.
5. Trip length for day visitors is assumed to be one full day, while for overnight visitors it is 2.7 days, based on Bowen Island Visitor Centre data. However, many overnight stays are by those visiting friends and relatives where accommodation, food and beverage and some other expenditures would be low. We estimate this sub-segment to be about half of the overnight market and have adjusted daily spending accordingly.
6. Our baseline estimate of 79,000 visitors and their related spending was cross-referenced to tourism related employment on Bowen Island and found to be within the expected range of error. Many

residents are unlikely aware of the activities of visitors. A Bowen Island resident perception study conducted in 2007 asked respondents to estimate how many visitors come to Bowen Island each year. The average was 16,902 estimated visitors per year to Bowen Island. The median (middle value) was 9,400 and the mode (most frequent response) was 10,000 estimated visitors. (Tourism BC 2007)

7. The number of visitors who already use the land and water base proposed for the park is an important factor in deriving incremental visitation because it represents the benchmark when comparing park attendance. Based on information requests for parks and outdoor recreation made at the Bowen Island Visitor Centre, 42% of all visitors to the Island are believed to now utilize those areas proposed for park status. An equally important assumption is that those use levels would continue in the future under the Park case.
8. Based on attendance data for Crippen Regional Park, the vast majority of current use is by residents and not off-Island visitors. For the three year period ending in 2009, we estimate resident attendance (use) of Crippen at 275,000. This works out to an average of 74 visits per full-time resident, or approximately 1.4 visits each week of the year by each resident.
9. Given the accessibility, facilities and infrastructure at Crippen, and the undeveloped nature of the other proposed park lands, we consider Crippen attendance to represent the vast majority of current resident and visitor use on the proposed park area. We recognize use does occur on the other properties such as Mt. Gardner and that that this might be heavy at times. Other properties, including Apodaca Provincial Park and the ecological reserve, are known to have very low use levels (Zevick 2010, pers. comm.). The absence of any reliable user data has led us to rely on Crippen attendance estimates as a benchmark for future National Park Reserve attendance.
10. The level of resident use only affects park attendance estimates—it does not affect the economic impacts in this study, which are calculated for non-resident visitors only.
11. Park visitation numbers were projected to 2025. The base year of the projections is 2010, but it is uncertain when and if park establishment would occur, so visitor projections are made for Years 1 to 15. The onset of Year 1 is unknown but for analytical purposes it is assumed to be 2011.

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Base Case Forecast of Annual Visitors to Bowen Island

Base Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	
Total visitors	79,000	80,300	81,600	82,900	84,200	85,500	86,800	88,100	89,400	90,700	92,000	93,300	94,600	95,900	97,200	98,500
Seasonal residents	10,200	10,300	10,400	10,500	10,600	10,700	10,800	10,900	11,000	11,100	11,200	11,300	11,400	11,500	11,600	11,700
Net visitors	68,800	70,000	71,200	72,400	73,600	74,800	76,000	77,200	78,400	79,600	80,800	82,000	83,200	84,400	85,600	86,800
Day-trip	48,800	49,600	50,400	51,200	52,000	52,800	53,600	54,400	55,200	56,000	56,800	57,600	58,400	59,200	60,000	60,800
Overnight	9,000	9,200	9,400	9,600	9,800	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600	11,800	12,000
Boaters	11,000	11,200	11,400	11,600	11,800	12,000	12,200	12,400	12,600	12,800	13,000	13,200	13,400	13,600	13,800	14,000
Total expenditures	2,854,000	2,905,000	2,955,000	3,006,000	3,056,000	3,107,000	3,157,000	3,208,000	3,258,000	3,309,000	3,359,000	3,410,000	3,460,000	3,511,000	3,561,000	3,612,000

Base Case Forecast of Incremental Annual Visitors to Bowen Island

Base Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	
Total visitors	26,500	26,940	27,380	27,820	28,270	28,710	29,250	29,690	30,130	30,570	31,020	31,560	32,000	32,440	32,880	33,330
Day-trip	20,400	20,700	21,100	21,400	21,700	22,100	22,400	22,700	23,100	23,400	23,700	24,100	24,400	24,700	25,100	25,400
Overnight	3,800	3,800	3,900	4,000	4,100	4,200	4,300	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	
Boaters	2,300	2,340	2,380	2,420	2,470	2,510	2,550	2,590	2,630	2,670	2,720	2,760	2,800	2,840	2,880	2,930
Expenditures	1,111,600	1,125,100	1,148,500	1,168,000	1,186,400	1,209,900	1,229,400	1,242,800	1,265,300	1,284,800	1,304,200	1,327,700	1,347,100	1,360,600	1,383,100	1,402,500
Day-trip	791,000	803,000	818,000	830,000	841,000	857,000	869,000	880,000	896,000	907,000	919,000	934,000	946,000	958,000	973,000	985,000
Overnight	237,000	237,000	244,000	250,000	256,000	262,000	269,000	269,000	275,000	281,000	287,000	294,000	300,000	306,000	312,000	
Boaters	83,600	85,100	86,500	88,000	89,400	90,900	92,400	93,800	95,300	96,800	98,200	99,700	101,100	102,600	104,100	105,500

Visitor Projection Methodology

Estimating the number of visitors who would come to the proposed park presented special challenges for this assessment due to Bowen Island's unique location characteristics.

An estimate could be based on a determination of total demand and the park's ability to attract that demand. BC Parks, Tourism BC, the Canadian Tourism Commission and Parks Canada all have visitor and consumer studies showing domestic and international park visitation patterns and interest levels. For example, Parks Canada's *Attitudes and Barriers* study (2010) shows that 41% of Vancouver respondents indicated they were interested in visiting a nearby national park in the next two years. If these results were extrapolated for the GVRD population, then visitation to GINPR and Pacific Rim National Park would be in the neighbourhood of one million visitors (sometime in that two year period). Actual park attendance falls well below these expressed interest levels so determining the reasons why become important inputs to the modelling exercise.

The same study offered some insights for the difference between interest levels and actual attendance. Transportation costs and time are two important factors as both nearby national parks require ferry travel. Perhaps a bigger driver is competition from provincial parks. In the GVRD, there are several major provincial parks, notably Golden Ears, Seymour Mountain and Cypress Mountain, with significant attendance levels and comparable features to the Bowen Island properties. Given the interaction of these variables, we found that a starting point based on an assumed penetration rate of the regional market could not be confidently made.

Our approach was to rely on revealed preferences, that is, what residents and visitors already do on the land base and then project forward what might occur if the park were established. The recent establishment of GINPR provides some benchmark for this approach, not so much for attendance as the two land bases are different, then at least for the extent of change from baseline conditions.

The first step was to project the base case, that is visitation or use of the proposed park properties that would have occurred if the NPR did not exist, then factor in an increment based on the assumption that national park status would increase the overall marketability of Bowen Island. "New" visitors would then spend money on products and services that would stimulate employment and employment income effects among those businesses receiving the spending. If the change in visitation and spending is large enough, tourism businesses would make new investments in their operations, hiring new personnel and perhaps building new facilities and amenities.

A literature review was undertaken to determine methodologies employed to estimate changes in visitation attributable to park designation. Although no Canadian studies were found, two international studies provided insights into possible park visitation effects.

- The first study by Colorado State University looked at several national monuments in the US that were re-designated as parks for evidence of changes in visitation. "Land re-designation of this sort should enhance the importance and interest in the site as a tourist destination. Changes in allowable uses, availability of services, and in the number of citations in promotions materials may influence these real or perceived differences in site quality or awareness. The effect of this

adjustment in public perception can be measured through changes in annual visitors to the site holding all other factors constant." (Seidl and Weiler 2001) The author's research determined that the Black Canyon of Gunnison National Park would experience a net gain in visitation of 12% when designated as a National Park.

- The second study conducted by the European Tourism Research Institute was based on findings from two different surveys of visitors to Fulufjället National Park in Sweden (one year before and one year after national park designation respectively). Visitors were specifically asked if they would have visited the park in the absence of park designation. "Under a hypothetical scenario of no national park in Fulufjället there will be a decrease in visitors in the range of 7–15 percent." Furthermore, "comparing the visitors that came the year before Fulufjället was designated a national park with those that came one year after show some interesting differences... In general, visitors are more positive toward national parks and it looks like about one in ten visitors came to Fulufjället only because the place was a national park. While it looks like a national park as such matters, changes identified here may partly be driven by improvements in infrastructure such as roads, visitor center, signs, trails – all of which took place during the study period." (Fredman 2004)

GINPR experience also provides some guidance. Visitation to affected islands is not believed to have changed dramatically since park formation with activities and use levels occurring much as they have in the past. But Bowen Island is much closer to GVRD markets and is proposing facility development (such as a visitor centre) that does not exist in the GINPR so it is equally clear that the potential for attendance would be greater for the proposed park.

Another key assumption in the attendance estimates is that there are no fees for day use, as is now the case with the GINPR. Any consideration of day use fees would substantially affect the following attendance estimates.

In consideration of the above research, and recognizing the differences between the areas studied and Bowen Island, we used the following coefficients to model incremental visitation.

- In the low estimate, a seven percent increase in visitors is projected while the medium estimate projects a 15% increase. The above-noted Sweden and Colorado studies were used to set this range.
- The high estimate more than a change in land management and awareness due to national park status, which was the focus of the international research. The proposed capital investments in facilities and operating programs would contribute toward Parks Canada's goal of increasing accessibility to urban audiences. In recognition of the proximity to the GVRD regional population, we raised our incremental visitation to 25%.
- In all cases, it is assumed that the proposed park would extend the stay or visitors who would come to Bowen Island even if the park did not exist. The increments are as follows:
 - Low - 2% of all overnight visitors for a quarter day;
 - Medium 2 – 6% of all overnight visitors for a quarter day; and
 - High - 11% of all overnight visitors for one half day.

Increments do not apply to day visitors since we have already assumed they visit and spend as though they were on the Island for a full day.

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Forecast of Number of Visitors to the NPR

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Low															
Park attendance	306,650	309,510	312,090	314,450	316,870	319,350	321,820	324,280	326,960	329,800	332,760	335,960	339,130	342,290	345,510
Residents	277,960	280,350	282,460	284,340	286,270	288,250	290,240	292,210	294,400	296,740	299,210	301,930	304,630	307,320	310,070
Day-trip	22,210	22,570	22,940	23,310	23,680	24,060	24,440	24,820	25,200	25,570	25,950	26,320	26,690	27,050	27,410
Overnight	4,140	4,200	4,270	4,340	4,410	4,480	4,550	4,620	4,690	4,760	4,830	4,900	4,970	5,040	5,100
Boaters	2,340	2,380	2,420	2,470	2,510	2,550	2,590	2,630	2,670	2,720	2,760	2,800	2,840	2,880	2,930
Incremental visitation	1,890	1,920	1,950	1,980	2,010	2,050	2,080	2,110	2,140	2,180	2,210	2,240	2,270	2,300	2,330
Day-trip	1,450	1,480	1,500	1,520	1,550	1,570	1,600	1,620	1,650	1,670	1,700	1,720	1,750	1,770	1,790
Overnight	270	280	280	280	290	290	300	300	310	310	320	320	330	330	330
Boaters	160	170	170	170	180	180	180	180	190	190	190	200	200	200	210
Medium															
Park attendance	308,620	311,510	314,120	316,520	318,970	321,480	323,990	326,480	329,200	332,070	335,060	338,290	341,500	344,690	347,940
Residents	277,960	280,350	282,460	284,340	286,270	288,250	290,240	292,210	294,400	296,740	299,210	301,930	304,630	307,320	310,070
Day-trip	23,870	24,260	24,650	25,050	25,450	25,860	26,270	26,670	27,080	27,490	27,890	28,290	28,680	29,070	29,450
Overnight	4,450	4,520	4,590	4,670	4,740	4,820	4,890	4,970	5,040	5,120	5,200	5,270	5,340	5,420	5,490
Boaters	2,340	2,380	2,420	2,470	2,510	2,550	2,590	2,630	2,670	2,720	2,760	2,800	2,840	2,880	2,930
Incremental visitation	4,040	4,110	4,180	4,250	4,310	4,380	4,450	4,520	4,590	4,660	4,730	4,800	4,860	4,930	5,000
Day-trip	3,110	3,160	3,220	3,270	3,320	3,370	3,430	3,480	3,530	3,590	3,640	3,690	3,740	3,790	3,840
Overnight	580	590	600	610	620	630	640	650	660	670	680	690	700	710	720
Boaters	350	360	360	370	380	380	390	390	400	410	410	420	430	430	440
High															
Park attendance	311,080	314,020	316,670	319,100	321,590	324,150	326,700	329,230	331,990	334,900	337,940	341,210	344,450	347,690	350,980
Residents	277,960	280,350	282,460	284,340	286,270	288,250	290,240	292,210	294,400	296,740	299,210	301,930	304,630	307,320	310,070
Day-trip	25,940	26,370	26,790	27,230	27,660	28,110	28,550	28,990	29,440	29,880	30,320	30,750	31,180	31,600	32,020
Overnight	4,830	4,910	4,990	5,070	5,150	5,240	5,320	5,400	5,480	5,570	5,650	5,730	5,810	5,890	5,960
Boaters	2,340	2,380	2,420	2,470	2,510	2,550	2,590	2,630	2,670	2,720	2,760	2,800	2,840	2,880	2,930
Incremental visitation	6,740	6,850	6,960	7,080	7,190	7,310	7,420	7,540	7,650	7,770	7,880	8,000	8,110	8,220	8,330
Day-trip	5,190	5,270	5,360	5,450	5,530	5,620	5,710	5,800	5,890	5,980	6,060	6,150	6,240	6,320	6,400
Overnight	970	980	1,000	1,010	1,030	1,050	1,060	1,080	1,100	1,110	1,130	1,150	1,160	1,180	1,190
Boaters	590	600	610	620	630	640	650	660	670	680	690	700	710	720	730

Tourism Impact Methodology

The incremental visitation was the base for generating estimates of incremental spending using regional data sources and coefficients, as follows:

- The per diem spending (\$62 for overnight and \$39 for day-visitor) (Tourism BC 2009) was then used to calculate incremental visitor spending. Normally, we would increase overnight visitor spending by their average length of stay (2.7 days), but as noted in our baseline discussion, this would over-estimate spending because it would not account for those visiting friends and relatives (who spend less than other overnight visitors). The imputed length of stay for overnight visitors, in determining spending, is therefore one full day.

Incremental spending was then used to determine employment and employment income impacts, using the following data:

- Proportion of accommodation spending to total visitor spending of 19% (Tourism BC 1998).
- Accommodation and food service multiplier per \$1million in spending of 14.76 (Horne March 2008).
- Direct tourism ratio (i.e. ratio of total tourism to accommodation employment) of 4.0. BIM was assumed to be similar to the Gulf Islands (4.18) and Sunshine Coast (4.59) (Horne March 2009), but with a slightly lower impact quotient given the absence of hotel, conference and other tourist facilities.
- Indirect employment multiplier of 1.07, the same as Gulf Islands and Sunshine Coast (Horne March 2009).
- Average wage in 2006 for accommodation and food and beverage occupations of \$29,636. (Statistics Canada 2006) A 2010 estimate of \$30,822 was calculated using the BC Consumer Price Index.
- Average wage on Bowen Island (all occupations) in 2006 of \$56,031 indexed by the CPI for a 2010 wage of \$58,272 (BC Stats 2007).
- Average weighted personal income tax rate for Bowen Island of 19.7% (BC Stats 2007).

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Tourism Impacts

Low	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Incremental spending	84,680	86,080	87,480	88,920	90,350	91,790	93,240	94,680	96,130	97,600	99,030	100,450	101,860	103,240	104,620
Day-trip	60,350	61,350	62,340	63,340	64,360	65,390	66,420	67,450	68,480	69,510	70,530	71,540	72,540	73,520	74,480
Overnight	18,110	18,400	18,700	19,000	19,310	19,620	19,930	20,230	20,540	20,850	21,160	21,460	21,760	22,060	22,350
Boaters	6,220	6,330	6,440	6,570	6,680	6,780	6,890	7,000	7,100	7,240	7,340	7,450	7,550	7,660	7,790
Employment (person-years)															
Direct	0.94	0.95	0.97	0.98	1.00	1.01	1.03	1.05	1.06	1.08	1.09	1.11	1.13	1.14	1.16
Indirect	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Total	1.00	1.02	1.03	1.05	1.07	1.09	1.10	1.12	1.14	1.15	1.17	1.19	1.20	1.22	1.24
Employment Income															
Direct	27,700	28,200	28,700	29,100	29,600	30,100	30,500	31,000	31,500	32,000	32,400	32,900	33,400	33,800	34,300
Indirect	2,000	2,100	2,100	2,100	2,200	2,200	2,200	2,300	2,300	2,300	2,400	2,400	2,400	2,500	2,500
Total	29,700	30,300	30,800	31,200	31,800	32,300	32,700	33,300	33,800	34,300	34,800	35,300	35,800	36,300	36,800
Medium	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Incremental spending	185,950	189,020	192,080	195,240	198,380	201,550	204,720	207,890	211,080	214,300	217,450	220,570	223,650	226,690	229,730
Day-trip	132,780	134,970	137,140	139,350	141,600	143,860	146,120	148,390	150,660	152,920	155,170	157,390	159,590	161,750	163,870
Boaters	39,830	40,490	41,140	41,810	42,480	43,160	43,840	44,520	45,200	45,880	46,550	47,220	47,880	48,520	49,160
Overnight	13,340	13,570	13,790	14,080	14,310	14,540	14,760	14,990	15,220	15,500	15,730	15,960	16,190	16,420	16,700
Employment (person-years)															
Direct	2.06	2.09	2.12	2.16	2.19	2.23	2.26	2.30	2.33	2.37	2.40	2.44	2.47	2.51	2.54
Indirect	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.18	0.18
Total	2.20	2.24	2.27	2.31	2.35	2.38	2.42	2.46	2.50	2.53	2.57	2.61	2.65	2.68	2.72
Employment Income															
Direct	60,900	61,900	62,900	64,000	65,000	66,000	67,100	68,100	69,100	70,200	71,200	72,300	73,300	74,300	75,300
Indirect	4,400	4,500	4,600	4,700	4,700	4,800	4,900	5,000	5,000	5,100	5,200	5,300	5,300	5,400	5,500
Total	65,300	66,400	67,500	68,700	69,700	70,800	72,000	73,100	74,100	75,300	76,400	77,600	78,600	79,700	80,800

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High	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Incremental spending	341,300	346,940	352,550	358,340	364,110	369,920	375,750	381,560	387,410	393,320	399,090	404,820	410,470	416,040	421,610
Day-trip	245,440	249,490	253,510	257,600	261,740	265,920	270,110	274,290	278,500	282,680	286,820	290,940	294,990	298,990	302,900
Overnight	73,630	74,850	76,050	77,280	78,520	79,780	81,030	82,290	83,550	84,800	86,050	87,280	88,500	89,700	90,870
Boaters	22,230	22,610	22,990	23,470	23,850	24,230	24,610	24,990	25,370	25,840	26,220	26,600	26,980	27,360	27,840
Employment (person-years)															
Direct	3.77	3.84	3.90	3.96	4.02	4.09	4.15	4.22	4.28	4.35	4.41	4.47	4.54	4.60	4.66
Indirect	0.26	0.27	0.27	0.28	0.28	0.29	0.29	0.30	0.30	0.30	0.31	0.31	0.32	0.32	0.33
Total	4.04	4.10	4.17	4.24	4.31	4.38	4.44	4.51	4.58	4.65	4.72	4.79	4.85	4.92	4.99
Employment Income															
Direct	111,800	113,700	115,500	117,400	119,300	121,200	123,100	125,000	126,900	128,900	130,700	132,600	134,500	136,300	138,100
Indirect	8,100	8,300	8,400	8,500	8,700	8,800	9,000	9,100	9,200	9,400	9,500	9,700	9,800	9,900	10,100
Total	119,900	122,000	123,900	125,900	128,000	130,000	132,100	134,100	136,100	138,300	140,200	142,300	144,300	146,200	148,200

Appendix C Route 8 Traffic Forecast Model

This appendix contains the assumptions and methods used in developing passenger forecasts that are consistent with the high, medium and low visitation estimates. All data is provided by BC Ferries. Assumptions and parameter values are:

- 588,898 Average Passengers arriving from Horseshoe Bay 2006-10 (see Bowen Island Visitor Analysis)
- 255,709 Average Vehicles arriving from Horseshoe Bay 2006-10 (see Bowen Island Visitor Analysis)
- 62,152 August Average Passengers arriving from Horseshoe Bay 2006-10
- 24,308 August Average Vehicles arriving from Horseshoe Bay 2006-10
- 3,900 Visitor and Seasonal Resident Vehicle Arrivals in Aug BI in 2010 (see Bowen Island Visitor Analysis)
- 26.8% August Visitors as % of total annual
- 9.5% Baseline Aug traffic to total annual baseline traffic
- 2.45 person per visiting car
- 1.6 residents and seasonal resident per vehicle (guess, try to verify)
- 4.46 base year coefficient of seasonal residents to seasonal resident car arrivals

Route 8 Arrivals at Snug Cove, Bowen Island

	Annual Values		March Values		August Values		August Less March Values	
Fiscal year	Total Vehicles	Passengers	Total Vehicles	Passengers	Total Veh.	Passengers	Total Vehicles	Passengers
2001	224,619	552,722	19,262	44,366	22,293	59,682	3,031	15,316
2002	239,165	568,580	19,149	44,444	22,661	57,878	3,512	13,434
2003	248,519	584,418	19,898	43,578	23,573	62,611	3,675	19,033
2004	257,302	601,479	21,727	47,086	24,538	65,505	2,811	18,419
2005	267,312	620,435	22,304	49,662	24,285	62,567	1,981	12,905
2006	270,129	608,262	22,060	46,901	25,481	63,908	3,421	17,007
2007	263,685	602,208	20,494	45,225	25,252	64,475	4,758	19,250
2008	261,901	603,497	21,006	45,957	25,252	63,099	4,246	17,142
2009	242,312	566,787	18,496	41,243	23,196	60,255	4,700	19,012
2010	240,519	563,734	19,985	44,546	22,360	59,023	2,375	14,477
Average (2006/2010)	255,709	588,898	20,408	44,774	24,308	62,152	3,900	17,378

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Route 8 Base Case Traffic Forecast (Arrivals at Snug Cove, Bowen Island)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Total Pass.	594,477	599,524	604,140	608,855	613,682	618,508	623,294	628,502	633,981	639,721	645,913	652,065	658,217	664,460	670,822
Total Cars	258,019	260,082	261,945	263,854	265,815	267,775	269,717	271,855	274,118	276,501	279,094	281,669	284,243	286,859	289,531
Passengers															
Residents Seasonal	525,377	529,324	532,840	536,455	540,182	543,908	547,594	551,702	556,081	560,721	565,813	570,865	575,917	581,060	586,322
Residents	10,300	10,400	10,500	10,600	10,700	10,800	10,900	11,000	11,100	11,200	11,300	11,400	11,500	11,600	11,700
Visitors	58,800	59,800	60,800	61,800	62,800	63,800	64,800	65,800	66,800	67,800	68,800	69,800	70,800	71,800	72,800
Vehicles															
Resident Seasonal	243,216	245,043	246,670	248,344	250,069	251,794	253,500	255,402	257,429	259,577	261,935	264,274	266,612	268,993	271,429
Residents	2,207	2,228	2,249	2,271	2,292	2,314	2,335	2,356	2,378	2,399	2,421	2,442	2,464	2,485	2,506
Visitor	12,597	12,811	13,025	13,239	13,453	13,668	13,882	14,096	14,310	14,525	14,739	14,953	15,167	15,381	15,596
Walk-ons															
Resident Seasonal	136,232	137,256	138,167	139,105	140,071	141,037	141,993	143,058	144,194	145,397	146,717	148,027	149,337	150,671	152,036
Residents	6,770	6,835	6,901	6,967	7,032	7,098	7,164	7,230	7,295	7,361	7,427	7,493	7,558	7,624	7,690
Visitor	27,939	28,414	28,889	29,364	29,839	30,314	30,789	31,265	31,740	32,215	32,690	33,165	33,640	34,115	34,591
August Vehicles	24,528	24,724	24,901	25,082	25,269	25,455	25,640	25,843	26,058	26,285	26,531	26,776	27,021	27,269	27,523
% for 2010	101%	102%	102%	103%	104%	105%	105%	106%	107%	108%	109%	110%	111%	112%	113%

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Route 8 NPR Incremental Traffic Forecast (Arrivals at Snug Cove, Bowen Island)

Low	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Passengers/yr	1,723	1,752	1,780	1,809	1,838	1,867	1,897	1,926	1,955	1,985	2,014	2,043	2,071	2,099	2,127
Vehicles/yr	703	715	727	738	750	762	774	786	798	810	822	834	845	857	868
Increment to Aug traffic	85.8%	46.1%	32.8%	25.5%	20.9%	17.8%	15.6%	13.7%	12.2%	11.0%	9.9%	9.0%	8.3%	7.7%	7.2%
Medium															
Passengers/yr	3,693	3,754	3,814	3,876	3,938	4,001	4,064	4,127	4,190	4,253	4,316	4,377	4,438	4,499	4,557
Vehicles/yr	1,507	1,532	1,557	1,582	1,607	1,633	1,659	1,684	1,710	1,736	1,761	1,787	1,812	1,836	1,860
Increment to Aug traffic	183.8%	98.7%	70.3%	54.7%	44.8%	38.1%	33.3%	29.4%	26.2%	23.5%	21.2%	19.4%	17.9%	16.6%	15.5%
High															
Passengers/yr	6,155	6,256	6,357	6,460	6,564	6,668	6,773	6,878	6,984	7,089	7,193	7,296	7,397	7,498	7,596
Vehicles/yr	2,512	2,554	2,595	2,637	2,679	2,722	2,765	2,807	2,850	2,893	2,936	2,978	3,019	3,060	3,100
Increment to Aug traffic	306.4%	164.5%	117.2%	91.2%	74.7%	63.5%	55.6%	49.0%	43.6%	39.2%	35.4%	32.3%	29.8%	27.7%	25.8%

Appendix D Provincial Park Attendance Trends

Parks	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Alice Lake Park	328,510	300,681	327,303	293,364	292,507	270,860	303,369	294,619	293,226	362,130
Birkenhead Lake Park	20,008	20,435	21,704	22,240	21,909	25,161	19,797	18,840	18,226	19,895
Blackcomb Glacier Park	808,738	698,439	227,794	188,192	260,299	258,314	250,656	273,210	293,878	287,025
Brandywine Falls Park	168,475	168,786	190,089	141,381	116,385	105,508	105,422	95,032	121,709	126,382
Bridal Veil Falls Park	140,077	133,396	148,362	153,881	127,726	118,832	131,264	120,918	114,769	121,216
Callaghan Lake Park	-	-	-	-	-	-	4,603	3,283	2,520	2,093
Chilliwack Lake Park	68,096	72,223	94,926	82,791	98,655	87,119	124,494	112,984	72,973	89,150
Coquihalla Canyon Park	106,712	90,755	93,737	110,929	91,980	72,013	108,532	93,657	69,580	103,786
Cultus Lake Park	546,155	536,810	564,866	603,245	224,359	457,907	569,867	550,273	515,659	812,693
Cypress Park	2,241,747	1,539,794	1,222,095	1,360,401	928,428	1,102,539	1,307,219	1,286,926	1,346,583	1,138,379
Desolation Sound Marine Park	16,077	17,325	-	13,331	32,461	33,808	32,928	23,290	15,008	41,334
Francis Point Park	-	-	-	-	-	-	378	7,343	8,876	15,817
Garibaldi Park	88,303	83,266	103,362	87,210	74,531	85,101	89,129	101,539	103,849	105,361
Golden Ears Park	726,410	805,189	872,152	480,785	604,823	561,874	534,974	536,376	509,042	745,740
Halkett Bay Park	1,814	1,472	1,629	1,366	1,277	-	-	355	230	438
Inland Lake Park	-	35,074	1,469	10,297	23,680	24,154	17,021	21,628	25,945	28,375
Joffre Lakes Park	44,100	43,054	44,079	50,082	50,222	50,019	65,587	64,162	58,405	65,156
Mount Seymour Park	776,495	869,477	663,206	795,057	645,402	770,325	759,859	763,467	690,463	696,520
Murrin Park	154,987	137,599	181,671	162,180	141,628	134,239	155,425	134,876	206,423	113,684
Nairn Falls Park	111,816	125,366	121,134	115,764	101,549	118,976	122,962	111,974	104,738	146,186
Nicolum River Park	2,646	2,112	2,518	1,219	1,805	2,202	2,045	1,808	-	-
Peace Arch Park	531,703	513,265	504,788	208,555	207,897	203,522	242,778	160,010	125,885	107,506

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Parks	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Plumper Cove Marine Park	14,069	15,751	14,247	12,778	14,159	6,909	11,186	7,722	8,312	10,561
Porpoise Bay Park	135,362	127,976	114,370	119,848	113,045	122,556	108,681	108,154	130,743	128,380
Porteau Cove Park	368,266	337,233	345,437	321,837	321,695	302,024	356,067	392,513	427,337	405,395
Princess Louisa Marine Park	33,738	40,769	-	7,506	-	15,262	17,834	11,590	8,946	13,439
Roberts Creek Park	59,888	53,924	47,473	46,068	48,033	43,480	41,883	36,988	42,997	49,891
Rolley Lake Park	144,353	136,879	122,071	70,540	96,241	98,872	95,468	97,359	96,169	117,498
Saltery Bay Park	58,470	59,018	36,598	35,196	46,578	107,319	57,718	50,892	65,629	57,819
Sargeant Bay Park	64,876	65,818	69,717	68,450	58,699	59,458	54,436	75,233	69,108	55,066
Sasquatch Park	243,800	288,007	288,501	267,722	245,972	218,949	265,878	250,822	235,361	296,997
Shannon Falls Park	502,145	572,352	531,944	388,175	412,216	218,407	243,359	144,498	123,753	199,563
Silver Lake Park	56,053	54,417	46,132	38,500	24,894	17,604	45,303	39,432	49,699	48,075
Skagit Valley Park	43,637	41,675	29,806	48,338	27,810	32,015	37,162	33,876	40,438	39,122
Skookumchuck Narrows Park	30,975	29,960	30,482	25,484	31,280	38,934	23,177	24,234	25,417	23,167
Smuggler Cove Marine Park	24,939	24,072	19,376	17,486	17,633	22,036	14,578	21,109	17,290	12,821
Stawamus Chief Park	298,338	343,386	385,705	364,697	283,261	290,795	447,467	364,199	400,779	203,663
Tetrahedron Park	1,960	1,908	655	319	3,059	1,078	1,715	2,174	1,582	1,967

Source: Ministry of Environment (2010)

Note: Includes day, camping and boating use.

Appendix E BC National Park and Historic Site Attendance Trends

	2005-06	2006-07	2007-08	2008-09	2009-10	Avg	Avg % change
National Parks							
Gwaii Hanaas & Haida Heritage Site	1,868	1,868	2,098	1,940	1,755		-1.2%
Kootenay	425,006	445,364	454,520	421,096	426,570	434,511	0.1%
Mount Revelstoke & Glacier	606,159	611,173	619,889	603,699	610,995	610,383	0.2%
Pacific Rim	768,621	759,462	775,158	747,091	802,569	770,580	0.9%
Yoho	581,309	609,395	606,397	543,424	527,501	573,605	-1.9%
Historic Sites							
Chilkoot Trail	2,645	2,236	2,296	2,371	2,419	2,393	-1.8%
Fort Langley	61,412	62,709	68,853	81,687	84,566	71,845	6.6%
Fort Rodd Hill/ Fisgard Lighthouse	46,450	42,107	40,486	42,547	44,221	43,162	-1.0%
Fort St. James	12,662	11,582	10,534	9,886	9,631	10,859	-5.3%
Gulf of Georgia Cannery	22,649	17,716	18,136	25,213	34,440	23,631	8.7%
Nan Sdins	1,623	1,706	1,692	1,666	1,390	1,615	-3.1%
Rogers Pass	416,116	420,472	427,758	413,930	413,930	418,441	-0.1%

Source: Parks Canada (2010)

Appendix F Business Establishment Counts

Bowen Island Establishment Count, June 2008

Industry	# Est.
Total	535
1123 - Poultry and Egg Production	1
1125 - Aquaculture	1
1132 - Forest Nurseries and Gathering of Forest Products	1
1133 – Logging	6
1141 – Fishing	1
1153 - Support Activities for Forestry	2
2131 - Support Activities for Mining and Oil and Gas Extraction	1
2212 - Natural Gas Distribution	1
2213 - Water, Sewage and Other Systems	2
2361 - Residential Construction	44
2362 - Non-residential Building Construction	2
2372 - Land Subdivision	19
2373 - Highway, Street and Bridge Construction	1
2381 - Foundation, Structure and Building Exterior Contractors	3
2382 - Building Equipment Contractors	8
2383 - Building Finishing Contractors	16
2389 - Other Specialty Trade Contractors	12
3113 - Sugar and Confectionery Product Manufacturing	2
3118 - Bakeries and Tortilla Manufacturing	2
3121 - Beverage Manufacturing	1
3152 - Cut and Sew Clothing Manufacturing	1
3256 - Soap, Cleaning Compound and Toilet Prep. Man.	1
3271 - Clay Product and Refractory Manufacturing	1
3272 - Glass and Glass Product Manufacturing	1
3321 - Forging and Stamping	1
3323 - Architectural and Structural Metals Manufacturing	2
3332 - Industrial Machinery Manufacturing	1
3359 - Other Electrical Equipment & Component Manufacturing	1
3366 - Ship and Boat Building	3
3371 - Household and Institutional Furniture and Kitchen Cabinet Manufacturing	1
3391 - Medical Equipment and Supplies Manufacturing	1
3399 - Other Miscellaneous Manufacturing	3
4131 - Food Wholesaler-Distributors	1
4142 - Home Entertainment Equipment and Household Appliance Wholesaler-Distributors	1

Industry	# Est.
4144 - Personal Goods Wholesaler-Distributors	1
4161 - Electrical, Plumbing, Heating and Air-Conditioning Equipment and Supplies Wholesaler-Distributors	2
4172 - Construction, Forestry, Mining, and Industrial Machinery, Equipment and Supplies Wholesaler-Distributors	3
4173 - Computer and Communications Equipment and Supplies Wholesaler-Distributors	1
4183 - Agricultural Supplies Wholesaler-Distributors	1
4189 - Other Miscellaneous Wholesaler-Distributors	2
4191 - Wholesale Electronic Markets and Agents and Brokers	5
4412 - Other Motor Vehicle Dealers	1
4413 - Automotive Parts, Accessories and Tire Stores	1
4431 - Electronics and Appliance Stores	1
4441 - Building Material and Supplies Dealers	1
4451 - Grocery Stores	2
4452 - Specialty Food Stores	1
4461 - Health and Personal Care Stores	3
4471 - Gasoline Stations	2
4483 - Jewellery, Luggage and Leather Goods Stores	2
4511 - Sporting Goods, Hobby & Musical Inst. Stores	6
4531 – Florists	2
4539 - Other Miscellaneous Store Retailers	1
4543 - Direct Selling Establishments	1
4831 - Deep Sea, Coastal and Great Lakes Water Transportation	2
4841 - General Freight Trucking	6
4842 - Specialized Freight Trucking	1
4851 - Urban Transit Systems	1
4872 - Scenic and Sightseeing Transportation, Water	1
4885 - Freight Transportation Arrangement	1
4921 - Couriers	1
5111 - Newspaper, Periodical, Book & Database Publishers	4
5112 - Software Publishers	2
5121 - Motion Picture and Video Industries	17
5122 - Sound Recording Industries	2
5179 - Other Telecommunications	1
5191 - Other Information Services	1
5221 - Depository Credit Intermediation	1
5222 - Non-Depository Credit Intermediation	1
5231 - Securities and Commodity Contracts Intermediation and Brokerage	1
5232 - Securities and Commodity Exchanges	1
5239 - Other Financial Investment Activities	14
5241 - Insurance Carriers	0
5242 - Agencies, Brokerages & Other Insurance Related Activities	1

Industry	# Est.
5311 - Lessors of Real Estate	11
5312 - Offices of Real Estate Agents and Brokers	12
5313 - Activities Related to Real Estate	7
5322 - Consumer Goods Rental	2
5411 - Legal Services	9
5412 – Acc., Tax Prep., Bookkeeping & Payroll Services	5
5413 - Architectural, Engineering and Related Services	19
5414 - Specialized Design Services	7
5415 - Computer Systems Design and Related Services	10
5416 - Management, Scientific & Technical Consulting Ser.	50
5418 - Advertising, Public Relations, and Related Services	5
5419 - Other Professional, Scientific and Technical Services	7
5511 - Management of Companies and Enterprises	15
5611 - Office Administrative Services	6
5614 - Business Support Services	4
5615 - Travel Arrangement and Reservation Services	2
5617 - Services to Buildings and Dwellings	10
5619 - Other Support Services	9
5621 - Waste Collection	2
5622 - Waste Treatment and Disposal	1
5629 - Remediation and Other Waste Management Services	0
6111 - Elementary and Secondary Schools	1
6112 - Community Colleges and C.E.G.E.P.s	1
6113 - Universities	1
6114 - Business Schools, Computer & Manag. Training	1
6116 - Other Schools and Instruction	7
6117 - Educational Support Services	3
6211 - Offices of Physicians	5
6212 - Offices of Dentists	1
6213 - Offices of Other Health Practitioners	1
6214 - Out-Patient Care Centres	1
6232 - Residential Developmental Handicap, Mental Health and Substance Abuse Facilities	1
6241 - Individual and Family Services	2
6243 - Vocational Rehabilitation Services	1
6244 - Child Day-Care Services	3
7111 - Performing Arts Companies	2
7112 - Spectator Sports	1
7113 - Promoters (Presenters) of Performing Arts, Sports and Similar Events	1
7114 - Agents and Managers for Artists, Athletes, Entertainers and Other Public Figures	1
7115 - Independent Artists, Writers and Performers	12
7139 - Other Amusement and Recreation Industries	4

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Industry	# Est.
7211 - Traveller Accommodation	2
7221 - Full-Service Restaurants	9
7222 - Limited-Service Eating Places	3
7224 - Drinking Places (Alcoholic Beverages)	1
8111 - Automotive Repair and Maintenance	1
8113 - Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1
8114 - Personal and Household Goods Repair and Maintenance	4
8121 - Personal Care Services	3
8129 - Other Personal Services	5
8131 - Religious Organizations	2
8134 - Civic and Social Organizations	3
8139 - Business, Professional, Labour and Other Membership Organizations	3
8141 - Private Households	7
9131 - Municipal Protective Services	3
9139 - Other Local, Municipal and Regional Public Administration	2

Source: Statistics Canada Business Register Data, prepared by BC Stats. October 25, 2010

Note: This data is produced semi-annually by Statistics Canada with June 2008 being the final period in which data for most BC communities was made available.

Appendix G Non-Business Organizations on Bowen Island

The table below outlines the active non-business organizations with infrastructure or assets that may be located in the proposed National Park boundaries on Bowen Island.

Organization	Purpose
Bowen Island Fish and Wildlife	Operates the Terminal Creek Salmon Hatchery and conducts stream quality assessments.
Bowen Island Heritage Preservation Association	Restores historic cottages in Davies Orchard (Crippen Park), maintains orchard plants new trees, maintain small museum in Cottage #10 and information kiosk.
Bowen Island Horse Owners and Riders Association	Enhances, promotes and protects opportunities for horse/rider enjoyment on Bowen Island. Maintains the riding ring in Crippen Park and riding trails throughout the Island.
Bowen Island Memorial Garden Society	Planning for development and operation of two-acre permanent garden park in Crippen Park.
Bowen Island Off Road Cyclists Association	Utilizes trails and roads on Bowen Island for off road mountain biking with Mount Gardner being the most popular mountain biking area on the Island.

Source: BowenOnline (2010)

A complete listing of community organizations on Bowen Island is located at the Bowen Island municipal internet site at: http://www.bimbc.ca/community_links.