An Economic Impact Assessment of UNESCO World Heritage Designation in Eastern Canada

by

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Thesis submitted in partial fulfillment of the

requirements for the Degree of

Bachelor of Arts with

Honours in Economics

Acadia University

March, 2013

This thesis by Ethan Purdy

is accepted in its present form by the

Department of Economics

as satisfying the thesis requirements for the degree of

Bachelor of Arts with Honours

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Acknowledgments

There are a number of people that I would like to thank that have assisted in the completion of this thesis. My supervisors Dr. Burc Kayahan and Dr. Brian VanBlarcom have been essential to the process. Dr. Kayahan in particular aided in my progress along the way and I could not have done it without his guidance. He helped me overcome multiple barriers that we encountered throughout the process. He has mentored me throughout my entire undergraduate degree and I am extremely grateful for all he has done in the classroom as well as outside it. Dr. VanBlarcom helped to facilitate the process and assist me in my understanding of the tourism industry.

I would also like to thank my family. They provided encouragement throughout the process and helped keep me focused. They have also supported me financially for which I am incredibly grateful. Your support both during this year as well as throughout my entire undergraduate degree has meant more to me than I can put into words.

To all my friends, you have helped keep me sane throughout this process. It has been a long journey and the fun we have had over the years will be remembered forever. Listening to practice presentations or being there to bounce ideas off of has greatly helped make this process just a little easier and for that I am grateful.

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Abstract

As the tourism industry continues to grow and become increasingly competitive, destinations want to find ways of distinguishing themselves. One such option is a World Heritage designation. We investigate whether or not sites that have been added to the World Heritage List have realized positive economic benefits as a result of their World Heritage designation. This study focused on four sites in Eastern Canada: Old Town Lunenburg, Grand Pre National Historic Site, the Joggins Fossil Cliffs, and Miguasha National Park. Data from before and after the World Heritage designation was used to conduct regression analysis to quantify the impact of designation on visitation to the site. A net present benefit was calculated for each site using 16 years of benefits and 19 years of discounting. A positive net present value was found for all four of the sites, although The Joggins Fossil Cliffs and Miguasha National Park had smaller economic impacts than the others. We find that World Heritage does indeed have a positive effect; however, the overall impact for Natural sites as designated by UNESCO is less than Historical/Cultural sites.

Chapter 1: Introduction

In 2011, international tourism receipts accounted for over $1 trillion USD with almost a billion international tourists (UNWTO, 2012). Additionally, international tourism receipts grew at four percent in 2011 and international tourism arrivals grew at 4.6% over the same time period (UNWTO, 2012). Domestic tourism is a large industry as well. Nova Scotia has received an average of two million visitors to the province annually (Economic and Rural Development and Tourism, 2011). When Nova Scotia residents that are traveling within the province are included the number of tourists increases to approximately eight million annually from 2000 to 2011 (Statistics Canada, 2012).

As the tourism industry continues to grow, tourism destinations must search for a means to differentiate themselves from competitors in order to attract visitors. One potential option for historical, cultural, and natural sites is a World Heritage designation. 'World Heritage' is a site designation determined by the United Nations Educations, Scientific, and Cultural Organization (UNESCO) for sites that demonstrate 'outstanding universal value' ("The Criteria for Selection", 2013). According to UNESCO, a World Heritage designation should lead to an increase in tourism and global awareness (The World Heritage Convention, 2013). Therefore, sites that receive designation, and their local economies, should benefit.

We aim to quantify the economic benefit from a World Heritage designation for four World Heritage designated sites located in Eastern Canada. The sites included are: Old Town Lunenburg, Grand Pre National Historic Site, The Joggins Fossil Cliffs, and Miguasha National Park. The first three sites are located in Nova Scotia and Miguasha National Park is located in Eastern Quebec. Figure One shows all the World Heritage sites in Canada.

Figure 1: Existing World Heritage Sites in Canada[1]

The four sites were chosen for specific reasons. Grand Pre National Historic Site and Old Town Lunenburg are both historical and cultural sites that are similar in many aspects, including motivation for designation, type of site, and proximity to Halifax. These similarities allow for a comparison between the two. The Joggins Fossil Cliffs and Miguasha National Park were chosen as they are the two natural sites located in Eastern Canada for which reliable visitation data were available.

One aspect of this research was to determine if there is a significant difference in the economic benefits between historical/ cultural sites and natural sites. Additionally, Miguasha National Park and Old Town Lunenburg are sites that have been designated as a World Heritage site for an extended amount of time, referred to as 'established' sites throughout this work. On

[1] Photo from Parks Canada. Source: "Canada's Existing World Heritage Sites." 2012. Map. Parks Canada. http://www.pc.gc.ca/progs/spm-whs/index.aspx.

the other hand, Grand Pre National Historic Site and The Joggins Fossil Cliffs are recently designated. We aim to determine if benefits are substantially different between established and recently designated sites. Distinguishing sites based on time of designation is important as the impact of a designation on visitation may decline over time as the novelty of the designation wears out. Distinguishing sites based on the type of designation is important because differences in the motivation of sites applying for a designation may also affect visitation. Therefore, these four sites are ideal for investigation as they cover the broad variations that are focused on in this research.

Old Town Lunenburg was designated a World Heritage site in 1995. It began the application process in 1993 at a cost of approximately $10,000 a year for three years (Haughn, 2009). Grand Pre National Historic Site began the application process in 2008 for three years at a total cost of $1.3 million and was designated in 2012 (Tourism Strategy Interpretation Framework, 2010). The Joggins Fossil Cliffs was designated a World Heritage site in 2008. The application for World Heritage designation began in 2006, lasted three years, and cost $250,000 (Boon, 2011). Miguasha National Park was designated in 1999; data is unavailable regarding the cost of the application and designation.

An economic impact analysis is an estimation of the incremental economic activity resulting from a specific event, or series of events, on a local region; in this case, the event is receiving a World Heritage designation. The first step in this analysis is determining changes in visitation due to designation. The second step is an estimation of average spending to determine the economic benefit of designation. Finally, a cost-benefit approach is taken to calculate net present benefit and value.

The first step was achieved by conducting a time series regression analysis to isolate for the impact of the World Heritage designation on visitation. The regression varied slightly for

each of the sites we investigated as visitation was affected by various factors that were not consistent across all sites. Furthermore, due to insufficient data, separate dependent variables were used as levels of visitation were unknown in some instances. Lastly, the time period over which the analysis was conducted varied depending on availability of data as well as when each site received its World Heritage designation.

The second step involved computing the economic benefit of designation. This was done by applying the World Heritage coefficient, calculated from the regression in the first step, to annual visitation to determine the number of individuals that visited due to the World Heritage site designation. Average daily spending per person was calculated using local surveys conducted at each of the sites at various dates. The overall annual economic benefits were computed by applying the average daily per person spending estimated to the change in visitation due to designation.

The third and final step used a cost-benefit approach to estimate the net present value of the benefits. This value is adjusted for inflation and discounted to determine the net present value of designation for each of the sites.

Overall, the findings show a positive economic impact for all sites. However, Lunenburg and Grand Pre benefited substantially more than Miguasha or Joggins. This appears to suggest that World Heritage sites that are historical and cultural realize more economic benefits than sites designated as natural sites. As a result, sites that aim to increase tourism revenues for the surrounding area should consider applying for a World Heritage designation, particularly if they are historical or cultural sites as they are expected to benefit the most from a World Heritage designation.

The following section involves a review of the relevant literature, World Heritage, and forecasting tourism demand. This is followed by a methodology that lays out the process

adopted in this study. Next is a detailed review of the results of the study and their implications. Lastly, a conclusion combines the important aspects of the research and poses questions for future work.

Chapter 2: Literature Review

2.1 Background Information

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is an agency of the United Nations that has roots dating back to 1945. UNESCO functions as a mechanism to promote international collaboration through education, science, and culture. In 1972 the Convention Concerning the Protection of the World Cultural and Natural Heritage was held. This convention laid the foundation for the basis of World Heritage designation. The resultant treaty was adopted by UNESCO and established the process for World Heritage designation, giving UNESCO the authority to designate World Heritage sites. These sites are considered to be of outstanding universal value to humanity and should be protected so that future generations can appreciate and enjoy them (UNESCO, 1972). Sites on the World Heritage list are divided into two categories: 1) historical or cultural and 2) natural. As of January 2013, there are a total of 962 sites that have been designated; of these 745 are cultural and historical, 188 are natural, and 29 are mixed (World Heritage List, 2013). The World Heritage list includes some prominent sites such as the Pyramids of Giza, the Great Wall of China, and the Colosseum and Ancient Forum of Rome. Within Canada there are a total of 16 World Heritage sites.

The criterion used for determining which sites are to be designated has varied over time. A site must be of "outstanding universal value". Additionally, there are a number of other criteria that sites must fulfill to be added to the World Heritage list. Sites must meet at least one of ten criteria that apply to both types of sites as defined by UNESCO. These criteria include requirements such as: a site must demonstrate an outstanding example of a particular aspect of tradition, history, or architecture, represent creative genius, contain a natural phenomenon, be an area of exceptional natural beauty, contain significant and important natural habitats, or represent significant ecological or biological processes of evolution ("The Criteria for Selection",

2013). If at least one of these requirements is met in combination with the demonstration of "outstanding universal value" a site may be selected for a World Heritage designation.

2.2 Benefits of the UNESCO Designation

The literature relating to UNESCO World Heritage designation primarily focuses on the benefits of designation. These benefits can be broken down into two categories: 1) non-economic such as civic pride, conservation, and education and 2) economic such as additional tourism spending in the region. From the early days of designation, sites and UNESCO focused on the non-economic benefits to designation. Sites were motivated to apply and originally designated for purposes of protection and education. In fact, these sites were obliged to protect and educate the public (UNESCO, 1972; Rebanks Consulting Ltd and Trends Business Research Ltd, 2009). One example of such a site is Hadrian's Wall in the United Kingdom which was motivated primarily for protectionary reasons. This was common for sites designated up until the late 1980s as virtually all of them were motivated by these non-economic reasons. (Rebanks Consulting Ltd and Trends Business Research Ltd, 2009).

It was not be until the mid-1990s that a significant number of sites applying for designation would be motivated by economic reasons. For example, Collegiate Church, Castle and Old Town of Quedlinburg in Germany were designated in 1994. The site and town had been neglected. The town of Quedlinburg used World Heritage as their strategy by applying for designation with the expectation that they would use their designation for socio-economic purposes while also saving the site (Rebanks Consulting Ltd and Trends Business Research Ltd, 2009). In the two decades since, the number of sites motivated by these socio-economic reasons has been a steadily growing minority (Rebanks Consulting Ltd and Trends Business Research Ltd, 2009). Examples analyzing the economic impact of World Heritage designation include Hall and Piggin (2001), Van der Aa (2005) and VanBlarcom and Kayahan (2011).

Many studies investigating the socio-economic impact of World Heritage designation have focused specifically on the impact of tourism to the site and surrounding area. Due to the fact that a UNESCO World Heritage designation is provided for outstanding universal value, sites that receive designation are recognized as culturally, historically, or naturally important. Designated sites are seen as desirable destinations because of this recognition. Hence, intuition suggests that a site will see an increase in the level of visitation after designation (VanBlarcom and Kayahan, 2011). From this, the link to economic impact is clear; more visitors will lead to increased economic activity, assuming all else remains constant.

2.3 Early Literature

The early literature on the economic benefit of a World Heritage designation supports this intuition. Ashworth and Turnbridge (1990) argue that designated sites have used their World Heritage branding as a tool to draw international tourism in a competitive market. They claim that a World Heritage designation is enough to separate designated sites from similar, non-designated sites in terms of popularity with visitors. Hence, World Heritage designation has a positive impact on visitation. In a competitive market, a factor that gives one specific site an edge over its competition could result in significant changes in visitation. Drost (1996) argues that countries specifically publicize World Heritage sites because of their ability to attract tourists. Cook (1990) claims that one way in which this is done is the increase in public visibility due to designation. Sites that become designated receive attention in the media and their information is spread by the World Heritage Committee on their website and in publications. Shackley (2000) argues that this publicity, which occurs once a site is added to the World Heritage list, is "virtually a guarantee that visitor numbers will increase." Sites that have been designated are "magnets for visitors" because of their immense ability to draw in visitors from all over the world (Shackley, 2000). World Heritage is a powerful brand name that is marketable

on the international level which is what causes these sites to be “magnets” that draw tourists (Hall and Piggin, 2003). These studies represent the early research in investigating the economic and tourism benefits to World Heritage designation. However, it should be noted that these studies rely purely on theory and economic intuition rather than empirical observation.

2.4 Empirical Literature

In the late 1990s more locations began to realize that a World Heritage designation had the possibility to provide significant socio-economic benefits and the number of tourist destinations motivated to apply by this reasoning increased significantly. Accordingly, the research focus shifted as well. Literature regarding the economic benefits of designation began to adopt an empirical approach. This work often involved quantitative analysis of changes in visitation, shifting visitor demographics, and changing tourism revenues. Empirical work has seen mixed results with regard to the impact of designation on visitation.

Some studies have found minor but positive visitation increases as a result of World Heritage designation. Hall and Piggin (2001) and Van der Aa (2005) found that at least 40% of sites surveyed observed an increase in visitation of approximately one to five percent after designation. However, one should be careful when interpreting these results. Van der Aa (2005) claims that famous international sites such as the Pyramids of Giza or the Great Wall of China are less affected by the World Heritage designation. The logic behind this claim is that many of these prominent sites were already known internationally and thus benefit less from additional publicity. Furthermore, Nicot and Ozdirlik (2008) found that visitors to prominent historical sites often decide whether or not to travel to these destinations based on reputation rather than World Heritage status. Thus, the change in the percentage of visitation before and after designation for these types of sites is expected to be smaller than less prominent ones. World Heritage designated sites that are located in remote areas are likely to see a greater change in

visitation after designation because UNESCO World Heritage is a powerful brand capable of drawing visitors as well as the fact that designation will generate publicity for the site. Van der Aa (2005) argues that visitation changes appear to be inversely correlated with the global profile of the site with larger sites seeing less of an increase in visitation as a percentage of total visitation due to designation.

PricewaterhouseCoopers (2007) used survey data from 17 World Heritage sites in the United Kingdom. The authors determined that sites saw a zero to three percent increase in visitation upon receiving designation. Additionally, Galvin (1997) reported that from 1990 to 1995 national parks in the United States with a World Heritage designation had 5.2% greater visitation than non-designated sites.

Given the previous findings, there does appear to be empirical evidence suggesting, at the very least, a correlation between visitation and a World Heritage designation exists. This evidence supports the earlier claim of an increase in visitation due to designation found in the early literature. There is also evidence that a World Heritage designation may alter the visitor profile for sites. According to Van der Aa (2005), World Heritage sites tend to attract international tourists, who tend to spend greater lengths of time at the site as well as within the local area, and they tend to spend more when they are there.

Hall and Piggin (2001), Van der Aa (2005), and PricewaterhouseCoopers (2007) found positive effects of a World Heritage designation on visitation and overall economic impact. However, other research has not found these positive effects. The Rémy Prud'homme Report (2008) compiled three separate studies investigating the socio-economic impact of World Heritage Site status. The three studies come to the conclusion that the impact of World Heritage Site inclusion on local development is exaggerated (Prud'homme, 2008). According to the study,

the brand of 'UNESCO World Heritage Site' is insufficient to spur economic activity to the extent previously believed. Prud'homme looks at the extent of local development affected by World Heritage designation and determines that the perceived impact of World Heritage is overblown.

The first study used in Prud'homme's report was undertaken by Maria Barbara and Gravari Sebastien Jacquot (2007) and reviewed relevant literature. Specifically, they looked at the way and extent a heritage site became more attractive as a tourist destination if it were a World Heritage site. Based on their findings they concluded that the link between economic development and World Heritage status is "uncertain and probably quite tenuous" (Barbara & Jacquot, 2008).

The second study that Prud'homme investigates is one by Talandier (2008). Talandier uses an econometric analysis to determine the impact of World Heritage designation on site visitation. The purpose of this approach is to account for the impact of external factors unrelated to World Heritage designation. This study looked at five World Heritage Sites within France. The findings were that the impact of World Heritage designation was statistically insignificant.

The third study is one conducted by Nicot and Ozdirlik (2008). The study compared four heritage sites in Turkey; two were World Heritage sites and the other two were not. Of the four sites, two were archeological Ottoman sites: Troy was designated and Pergamum was not and two were Ottoman cities: Safranbolu was designated and Beypazari not. The two sets of sites were similar in size, location, and type of site. The study found that Troy and Safranbolu were successful in preserving heritage; however, they failed to trigger development. Contrastingly, Beypazari focused on an economic development program that proved more capable at fostering economic development than Safranbolu, which did not have a comprehensive economic

development program. These findings suggest that a development program, rather than World Heritage designation, is capable of fostering economic development. Therefore, Safranbolu, which was designated but did not have a comprehensive development plan, experienced none of the perceived economic benefits of World Heritage designation. The inability of UNESCO World Heritage designation to have a positive economic impact is inconsistent with intuition and previous research.

One possible source of the discrepancies between the studies in the Prud'homme Report (2008) and earlier work relates to the motivation behind a site's application for a World Heritage designation. Locations that apply for protection or celebration reasons are less likely to use their designation to attract new visitors. This is especially true for those sites that apply for a designation to protect their site by minimizing harm done by visitors. It would be counterproductive for these types of sites to then take action to increase visitation. Contrastingly, sites that apply for a World Heritage designation for marketing or economic reasons are more likely to take direct action to attract visitors. For example, sites may promote their designation to draw visitors to them. Furthermore, they may expand facilities in order to handle a greater number of visitors. This idea of motivation behind designation was investigated by Rebanks Consulting Ltd. and Trends Business Research Ltd. (2009). This research explored if a World Heritage designation could lead to economic growth and increased profits for tourism destinations. Their report separated all World Heritage sites into four categories:

1. A 'Celebration' Designation- these sites use their World Heritage designation as a type of celebration for maintaining the historical, cultural or natural heritage of the site. They use designation as global recognition of their site and its heritage, and consider a World Heritage designation as a reward.

2. A Heritage 'SOS' Designation- the primary motivation in this case is for the maintenance and preservation of the site. These types of sites apply for a designation when their site faces an emergency. This emergency is often the result of abuse or overuse by visitors. This type of designation is motivated by a desire to draw global attention to the site, which will increase the probability of investment to preserve the site.
3. A Marketing/Quality Logo/Brand- these are sites that view a World Heritage designation as a strong brand name and use it as a marketing tool. Therefore, they take direct action to draw publicity to the site with the intent of increasing the number of visitors. Thus, the motivations for these types of sites are educational and tourism related.
4. A 'Place Making' Catalyst- these sites are ones that have determined that a World Heritage designation can operate as a catalyst for economic development. They use the designation as a mechanism to spur economic activity and therefore are motivated by the economic impact of receiving designation.

Rebanks Consulting Ltd. and Trends Business Research Ltd. (2009) argued that when World Heritage designated sites are broken into these four categories patterns begin to emerge with regard to visitation and economic impact. Small or nonexistent impacts of designation, as per Prud'homme (2008), are the result of sites studied which are motivated by celebratory or SOS purposes (Rebanks Consulting Ltd and Trends Business Research Ltd., 2009). Sites motivated by either celebration or SOS are unlikely to see much of an impact from their designation. The reasoning is simple; these types of sites are not attempting to draw visitors and in SOS cases are actually attempting to limit the number of visitors. In contrast, sites motivated by marketing or place making actively use their designation to draw visitors. Some locations are more likely to see increases in visitation, economic activity, and economic development as a result of designation. Additionally, the majority of sites fall within the first two categories.

Hence, any attempt to determine the impact of designation on visitation or economic activity is likely to be offset by sites that are not attempting to use their designation for these purposes. Therefore, any study that attempts to measure economic impact or the impact on visitation should investigate the rationale for designation focusing primarily on World Heritage sites that were motivated by marketing or "place making" which try to maximize the economic benefits of designation (Rebanks Consulting Ltd and Trends Business Research Ltd., 2009).

2.5 Recent Literature

The more recent literature in the field attempts to isolate the impact of World Heritage designation on visitation by controlling for extraneous variables as seen in Talandier (2008). These econometric models are modeled after tourism forecasting models where numerous factors influence an individual's decision to travel and where to go. The focus of these models is to account for the impact of all extraneous travel factors which will isolate for the impact of World Heritage designation on visitation. In building these econometric models, the use of variables that capture push and pull factors relating to tourism is recommended (Song and Witt, 2000; Frechtling, 2001; Yang et al., 2010). Push factors are reasons which cause individuals to travel whereas pull factors are those that draw in visitors to a location for a specific reason. Including as many of these variables into econometric models allows for more precise modeling and a more accurate estimate of the impact of any particular factor on visitation (Song and Witt, 2000). Some of these push and pull factors include:

- Price of tourism in destination
- Price of tourism in substitute destinations
- The level of income in the country of origin
- The price of travel

- Advertising expenditure on tourism by destination in country of origin
- Consumer tastes and preferences in the country of origin
- A particular event or attraction occurring in either the destination or the origin

These factors are typically used for international tourists; however, they can be modified for domestic tourists. Predictably, some factors are more applicable than others. For example, consumer tastes, while still variable, may be more consistent across tourists than otherwise due to the fact that people are already traveling. Additionally, tourists typically consume specific types of goods and services while traveling. For example, tourists typically spend money on accommodations, food and beverages in restaurants, museum admissions, and souvenirs. However, consumer tastes within these categories may vary widely. Nevertheless, these push and pull factors build the basis for determining independent or explanatory variables when conducting econometric analysis (Song and Witt, 2000).

VanBlarcom and Kayahan (2011) conducted a regression analysis to isolate for the effect of a World Heritage designation on Lunenburg and Grand Pre, both of which are located in Nova Scotia. Their model includes independent variables with a dummy variable for the World Heritage designation, a dummy variable for events, and variables for the United States-Canada exchange rate and the inflation rate for gasoline. VanBlarcom and Kayahan (2011) found that World Heritage designation led to a 1.24% increase in the share of visitors to Nova Scotia that went to Old Town Lunenburg, a UNESCO World Heritage site. They concluded that the UNESCO designation led to a 6.2% increase in visitors to Lunenburg. Performing a cost-benefit analysis the authors determine that the net present value of the World Heritage designation from 1993 to 2009 is $36 million at a discount rate of four percent. The authors projected their findings for Grand Pre, Nova Scotia which had recently applied for World Heritage designation to determine

the forecasted net present value of designation over a 25 year period. Their conclusion using "base case" visitation and a four percent discount rate was that Grand Pre could expect a net present value of anywhere from $20,000 to $1.35 million over the 25 years (VanBlarcom and Kayahan, 2011). This broad range is due to different techniques in forecasting future visitation in Grand Pre.

While VanBlarcom and Kayahan (2011) provide some important insights there are some shortcomings in their methods. Their model covers some of the push and pull factors laid out by Song and Witt (2000). However, it excludes other important ones such as trends in the business cycle and the overall cost of travel at competing destinations. These exclusions may skew the impact of World Heritage designation as external factors may be captured by the World Heritage designation coefficient in the regression when other factors are the source of variation in visitation.

Additionally, their model uses only out of province visitation data which is likely to underestimate actual visitation to Lunenburg since they exclude intra-provincial tourists. The exclusion of intra-provincial tourists is important as Lunenburg visitation data is derived from accommodation statistics from Lunenburg. However, these accommodation statistics do not differentiate between out-of-province visitors and intra-provincial visitors. Thus, the authors are making the assumption that all individuals who stay in accommodations in Lunenburg are out-of-province visitors, which is unlikely to be the case. The study suffers from a small sample size due to limited data at the time of writing. Lastly, the dependent variable in which they used consisted of data both for residents and non-residents while they are only attempting to calculate non-resident changes. Their dependent variable is computed using the following equation:

$$NR\ Visitors\ to\ Lunenburg = \frac{Rooms\ Nights\ Sold_{TOTAL}}{Average\ Party\ Size_{NR}} * ALS_{NR} *\ \ V\ to\ OV_{NR}$$

Where room nights sold is the total number of hotel and motel rooms sold to all visitors. Average party size is the average party size of only non-resident visitors. ALS_{NR} is the average length of stay of only non-resident visitors. V to OV_{NR} is the visitors to overnight visitors ratio for exclusively non-resident visitors. Hence, when calculating the number of non-resident visitors to Lunenburg their calculation includes room nights sold to residents and non-residents. This overestimates the number of non-resident visitors to Lunenburg because only a proportion of all room nights sold actually go to non-residents.

We aim to build on the work of VanBlarcom and Kayahan (2011) by following a similar methodology while improving the specification of the model, expanding the scope of visitors to include both out-of-province and intra-provincial visitors, increasing the sample size relative to the work of VanBlarcom and Kayahan (2011), and correcting the mistake in the dependent variable in the Lunenburg regression.

Chapter 3: Methods and Data

The process of estimating and, in some cases, forecasting the economic impact of World Heritage designation is two-step and follows VanBlarcom and Kayahan (2011). The first step is to use regression analysis to isolate for the percentage of visitors coming to one of the designated sites due to its World Heritage designation. The second step is to use the calculated percentage of visitors coming to a site due to the World Heritage designation in order to determine the change in visitation and the economic benefits of designation. This step requires survey data for each of the sites targeted in this research to determine average spending which enables economic benefit to be calculated. This general process is consistent throughout the four sites that were targeted; however, due to various restrictions, the process had to be slightly adjusted for each of the sites.

By investigating these four sites we are able to make a comparison between established and recently designated sites, as well as between historical/cultural and natural sites. This distinction is important as economic benefits may vary across time as well as across the type of site. Benefits may vary across time because after a prolonged period in which a site has been designated the impact on visitation may be reduced. The distinction between historical/cultural and natural sites is important as sites may have different motivations for applying for a World Heritage designation.

3.1 Old Town Lunenburg

Old Town Lunenburg is located in Lunenburg, Nova Scotia. It is approximately 100 kilometers from Halifax, the capital and largest city in Nova Scotia. Lunenburg is a historical/cultural site as it is "the best surviving example of a planned British colonial settlement in North America" ("Old Town Lunenburg", 2013). The site, which was established in 1753, has maintained its appearance and identity by preserving the architecture of the

buildings. The town provides a superb example of a culture and community that is based on the Atlantic fishery. Located within the town is the Fisheries Museum of the Atlantic, the Lunenburg boat yards, and Lunenburg harbor all of which demonstrate the historical significance of the Atlantic fishery for the town. Old Town Lunenburg was designated as a World Heritage site in 1995; for the purposes of this study Old Town Lunenburg is considered an established designated World Heritage site.

For the regression step in the process of determining the economic benefit of designation on Lunenburg, the dependent variable, which is the share of visitors to Nova Scotia that go to Lunenburg was estimated for two groups of visitors, resulting in two separate specifications. This separation was necessary because the dependent variable consisted of limited and inconsistent data. There is no direct data that measures visitation to Lunenburg and therefore, it needs to be imputed from other sources of data. Annual room nights sold in Lunenburg, which is the total number of hotel or motel rooms sold to resident and non-resident visitors combined, was available as a source of data. This, however, only gave room nights sold and not actual visitation to Lunenburg. Hence, this data needed to be converted from the number of room nights sold to the number of visitors. To do this, the number of room nights sold was multiplied by the average length of stay for parties that stayed overnight. This converted the data into information on how long a party would stay in Lunenburg on average. This process was necessary because if a party comes to Lunenburg and stays for several nights the number of room nights sold increases but it does not affect the level visitation. This value was then divided by average party size to provide the number of visitors, rather than parties, that stayed overnight in Lunenburg. This conversion transformed the information on the number of room nights sold in Lunenburg to data on the number of visitors to Lunenburg that stayed overnight. This variable is still insufficient as it only provides data on the number of

overnight visitors and excludes day visitors. Therefore, the number of overnight visitors was multiplied by a ratio of visitors to overnight visitors to provide the total number of visitors to Lunenburg annually. This is shown in the equation below where ALS is the average length of stay:

$$Visitors\ to\ Lunenburg = \frac{Rooms\ Nights\ Sold}{Average\ Party\ Size} * ALS * \ \ Visitors\ to\ Overnight\ Visitors$$

The reason for the classification of the visitation among two different populations is due missing data. The number of rooms nights sold includes rooms sold to both residents and non-residents as hotels and motels do not distinguish between the two groups. Average party size, average length of stay, and the visitors to overnight visitors ratio are values that are obtained from the Nova Scotia Exit Survey (Nova Scotia 2005; Nova Scotia 2011). The Nova Scotia Exit Survey is a survey conducted every four to six years that asks non-residents leaving the province questions about their trip in Nova Scotia such as where they went, how long they stayed, and how many people were in their party. This survey excludes intra-provincial tourists in Nova Scotia. Consequently, part of the equation used to generate the main dependent variable in VanBlarcom and Kayahan (2011) focuses solely on non-residents and another part includes both residents and non-residents. To ensure consistency two separate dependent variables were created, one calculating exclusively non-residents to Lunenburg, Specification A, and one including both residents and non-residents, Specification B.

3.1.1 Non-Resident Visitation to Lunenburg

This is the first of two specifications for Lunenburg and is denoted 'Specification A'. This specification focuses exclusively on non-resident tourists traveling to Nova Scotia. For this specification the number of room nights sold had to be modified to incorporate exclusively non-residents. This was done using a survey conducted in Lunenburg in 2009 in which 322 surveys

were completed. The survey asked a number of questions aimed at identifying the visitor's origin, party size, if the party stayed in Lunenburg, and spending within the region. It should be noted that the survey excluded individuals who lived within a 30 minute drive of Old Town Lunenburg. This exclusion was done because these individuals are defined as locals rather than tourists and should be excluded from the results. From the survey, the percentage of room nights purchased by non-residents out of the total number of room nights sold in the survey was calculated. This percentage was then applied to total room nights sold data to determine the number of room nights sold to non-residents. Therefore, the number of non-resident visitors to Lunenburg was estimated using the following equation:

$$NR\ Visitors\ to\ Lunenburg = \frac{Rooms\ Nights\ Sold_{NR}}{Average\ Party\ Size_{NR}} * ALS_{NR} *\ \ V\ to\ OV_{NR}$$

where 'NR Visitors to Lunenburg' is the total number of non-resident visitors to Lunenburg, 'Room Nights $Sold_{NR}$' is the number of room nights sold to non-residents, 'ALS_{NR}' is the average length of stay by non-residents, and 'V to OV_{NR}' is the visitor to overnight visitor ratio of non-residents. Thus, the dependent variable for Specification A, denoted Y_{LunA}, is the percentage non-resident visitors to Nova Scotia that go to Lunenburg and is calculated using the following equation:

$$Y_{LunA} = \frac{Non - Resident\ Visitors\ to\ Lunenburg}{Non - Resident\ Visitors\ to\ Nova\ Scotia}$$

Furthermore, Specification A enables a direct comparison between these findings and the findings of VanBlarcom and Kayahan (2011) in which a variable that included resident and non-resident data was used. In their model, room nights sold incorporated both non-residents and residents whereas the other variables were taken from the Nova Scotia Exit Survey (Nova Scotia 2005; Nova Scotia 2011) and therefore, represent the values for non-residents.

3.1.2 Total Visitation to Lunenburg (resident and non-resident tourists)

As discussed previously, Specification A incorporates only non-resident visitors. However, non-residents are only a fraction of all visitors and, therefore, provide only part of the economic impact. Knowing the economic impact of both non-residents and residents provides the overall direct economic impact. For that reason, a regression specification incorporating visitation of non-residents and residents was created. As already discussed, room nights sold incorporates residents and non-residents; so, for the purposes of this specification it could remain unmodified. The remaining variables- average party size, average length of stay, and visitor to overnight visitor ratio- were all previously determined from the Nova Scotia Exit Survey (Nova Scotia 2005; Nova Scotia 2011). These values were no longer applicable as they focused exclusively on non-residents. A modified version of average party size, average length of stay, and visitor to overnight visitor ratio were created by using a ratio of these variables between the survey conducted in 2009 and results from the Nova Scotia Exit Survey.

The reason that a ratio was taken, and not the finding from the survey directly, is due to limitations in the 2009 Lunenburg Survey. The survey had a small sample size of non-resident visitors relative to that of the Nova Scotia Exit Survey. However, the relative comparisons between the resident and non-resident visitors in the survey were consistent as non-residents stayed longer and spent more. Hence, the average length of stay, average party size, and visitors to overnight visitors ratio values were extrapolated using the ratio of these values between the sample of all visitors and non-resident visitors in the survey.[2] Using these adjusted values the total number of visitors to Lunenburg was calculated using the following equation:

$$Total\ Visitors\ to\ Lunenburg = \frac{Room\ Nights\ Sold}{APS_{Adjusted}} * ALS_{Adjusted} *\ V\ to\ OV_{Adjusted}$$

[2] The estimated figures using this approach are presented in section 4.2.1

'$APS_{Adjusted}$' is the modified average party size, '$ALS_{Adjusted}$' is the modified average length of stay and 'V to $OV_{Adjusted}$' is the modified visitors to overnight visitors ratio.

The dependent variable for Specification B is the percentage of total visitors to and within Nova Scotia that go to Lunenburg. Instead of dividing by the number of non-resident visitors to Nova Scotia, visitation to Lunenburg is divided by total visitation to and within Nova Scotia. This is defined in the following equation:

$$Y_{LunB} = \frac{Total\ Visitors\ to\ Lunenburg}{Total\ Visitation\ to\ and\ within\ Nova\ Scotia}$$

The importance of separating specifications A and B is to distinguish the economic impact of non-residential visitors and all visitors as a result of World Heritage designation.

3.1.3 Explanatory Independent Variables

Building upon the work of VanBlarcom and Kayahan (2011) and incorporating insights from Song and Witt (2000) a regression specification was created to incorporate the relevant determinants of travel. Regression specifications A and B are:

Specification A:

$$Y_{LunA} = \beta_0 + \beta_1 WHDLUN + \beta_2 ATTRACTION_L + \beta_3 IRURBNS + \beta_4 IRTPI + \beta_5 \log(CAN2EURO) + \beta_6 HPFILTER + u_t$$

Specification B:

$$Y_{LunB} = \beta_0 + \beta_1 WHDLUN + \beta_2 ATTRACTION_L + \beta_3 IRURBNS + \beta_4 IRTPI + \beta_5 \log(CAN2EURO) + \beta_6 HPFILTER + u_t$$

The dependent variables, Y_{LUNA} and Y_{LUNB}, are the percentage of non-residential visitors coming to Nova Scotia that visit Lunenburg, and the percentage of total visitors to and within

Nova Scotia that visit Lunenburg, respectively. WHD_{LUN} is a dummy variable indicating whether or not Old Town Lunenburg had World Heritage designation for a particular year. This variable takes a '1' if Lunenburg has World Heritage designation in that particular year and the value '0' otherwise. $ATTRACTION_L$ is a dummy variable indicating whether or not visitation to Lunenburg is affected by a particular event unrelated to World Heritage. This variable takes a '1' if in that particular year there was an event in the region that may have affected visitation and the value '0' otherwise. IRURBNS is the inflation rate in Halifax. This variable captures the percentage change in the cost of tourism in Halifax. IRTPI is the inflation rate of the travel price index which is comprised of a basket of goods most commonly used by tourists. It measures the percentage change in the price level of goods and services consumed most commonly by tourists. CAN2EURO is the exchange rate between the Canadian dollar and the Euro. This captures annual fluctuations in the Canadian dollar relative to the Euro. This variable is relevant for international tourists. Lastly, HPFILTER measures deviations in annual real Canadian GDP from its trend. This captures the fluctuations in the level of Canadian economic activity across time.

3.1.4 Economic Impact

The β_{WHD} coefficient is the impact of World Heritage designation on the share of visitors to Nova Scotia that went to Lunenburg (Specification A) or the share of visitors to and within Nova Scotia that went to Lunenburg (Specification B). From this the change in visitation to Lunenburg as a result of World Heritage designation can be calculated as follows:

$$Change\ in\ Visitation = \frac{\beta_{WHD}}{100} * Annual\ Visitation$$

This equation gives the number of additional visitors that came to Lunenburg as a result of its designation. Therefore, the economic benefit can be calculated by multiplying this change in visitation by daily per person spending. This spending data was determined in the Lunenburg

survey from 2009 in which it was determined that non-residents spent on average $127 daily per person whereas residents and non-residents combined spent on average $112.64. Discounting the annual economic benefits and summing them provides the present value of the economic benefit of designation for Lunenburg in Specifications A and B. Discounting the net benefit of the World Heritage designation accounts for the opportunity cost of capital. The time period in which annual economic benefits for Lunenburg were calculated is 1996 to 2011 which provides an accurate estimate of the overall value of Lunenburg's World Heritage designation from the time of initial application to the present.

3.2 Grand Pre National Historic Site

Grand Pre is located in Kings County, Nova Scotia, approximately 100 kilometers from Halifax. Grand Pre is a historical/cultural site due to the enduring culture and human ingenuity of the Acadians that once occupied the land. The community dates back to 1680 when dykes were used to transform marshlands into pastures and farmlands. The area thrived for approximately 80 years. However, in 1755 the British began deporting the Acadian farmers. After ten years of deportations, 10,000 Acadians had been displaced. Nevertheless, the Acadian people found ways of preserving their culture (Government of Nova Scotia, 2013). Grand Pre National Historic Site was designated as a World Heritage site in 2012; therefore, for the purposes of this research Grand Pre is considered a recently designated site.

3.2.1 Regression Analysis

Due to the fact that Grand Pre was only designated in the summer of 2012 there is insufficient data to run a regression in order to isolate for the impact of designation on visitation. Therefore, Lunenburg was used as a substitute because it is assumed that World Heritage designation will have a proportional impact for Grand Pre (VanBlarcom and Kayahan 2011). The two sites are cultural sites (World Heritage List, 2013). Furthermore, VanBlarcom and

Kayahan (2011) add that the two sites share proximity to Halifax and each other. Furthermore, as Rebanks Consulting Ltd. & Trends Business Research Ltd. (2009) stress the importance of, they had similar motivations for designation. Both sites were motivated by the economic prospects of a World Heritage designation (VanBlarcom and Kayahan 2011). Due to these similarities, the change in visitation due to a World Heritage designation of Lunenburg divided by total visitation to Lunenburg was calculated. This calculation gave the impact of a World Heritage designation as a percentage of people visiting Lunenburg and assuming proportionality it can be applied to Grand Pre.

3.2.2 Economic Benefit

Since it is believed that the impact designation for Grand Pre and Lunenburg will be proportional, the calculated effect of World Heritage designation as a percentage of people visiting Lunenburg can be applied to Grand Pre. Grand Pre's economic value of designation must be forecasted and therefore some prediction for future annual visitation to Grand Pre is required. Two models are used: historical, which constitutes a historical average visitation to Grand Pre, and current, which is made up of 2011 visitation data. Using these two visitation models the forecasted net present benefit for Grand Pre is calculated. The economic benefit is calculated from 2010 to 2028 and consists of 16 full years of benefits, consistent with Lunenburg's. This is done to allow for a comparison between the different sites.

3.3 The Joggins Fossil Cliffs

The Joggins Fossil Cliffs are located along the Fundy Shore in Nova Scotia approximately 220 kilometers from Halifax. These cliffs contain a variety of fossils that offer a unique insight into plant and animal life in the Coal Age, dating back 300 million years. At the time the region was located along the tropics where animal and plant life flourished. Fossils are embedded in the cliffs and offer "the finest example in the world of the terrestrial tropical environment" from

the Coal Age ("The Joggins Fossil Cliffs", 2013). Throughout the years the cliffs have been visited by many leading geologists due to the exceptional quality and uniqueness of the fossils. In 1852 Charles Lyell and William Dawson, two of the founders of modern geology, discovered the tetrapod and Hylonomus lyeli. The Hylonomus Lyeli remains the earliest known reptile to have lived on land. The rarity of the specimens combined with the historical importance in our understanding of geology and evolution demonstrates the significance of the Joggins Fossil Cliffs. In 2008 The Joggins Fossil Cliffs was designated as a natural World Heritage site; for the purposes of this study it is defined as a recently designated natural site (World Heritage List, 2013).

3.3.1 Regression Analysis

Conducting regression analysis for Joggins poses some problems as the data prior to designation is unreliable and invariable. Visitation estimates are not annual but instead a single estimate. This poses a problem for conducting regression analysis as the dependent variable should exhibit variations across time. Therefore, the Fundy Geological Museum (FGM)[3] is used as a proxy for Joggins visitation. FGM is a good proxy as it is in close proximity to Joggins, is also a geological site and therefore it should experience similar fluctuations to its visitation as The Joggins Fossil Cliffs. Furthermore, FGM has reliable and variable annual visitation data. Their annual visitation estimates from 2008 to 2011 are consistent with the variable and reliable data from Joggins post-2008, which reaffirms the use of FGM as a proxy for Joggins. Unlike Lunenburg, it was unnecessary to use the percentage of visitors out of Nova Scotia that go to

[3] The Fundy Geological Museum is a geological museum located in Parrsboro, Nova Scotia approximately 40 kilometers from Joggins. It consists of fossils of a number of prehistoric animals including dinosaurs, reptiles and insects. The museum was established in 1993 ("Visit Us", 2012).

the site because we have actual visitation numbers for Joggins. The Joggins regression is as follows:

$$PCFGM = \beta_0 + \beta_1 WHDJOG + \beta_2 PCNRNSV + \beta_3 ATTRACTIONJ1 + \beta_4 ATTRACTIONJ2 + \beta_5 LOGCAN2EURO + u_t$$

PCFGM is the percentage change in annual visitation to Fundy Geological Museum. WHD_{JOG} is a dummy variable indicating whether or not The Joggins Fossil Cliffs is designated in a specific year. It has the value '1' in years in which the site is designated and '0' otherwise. PCNRNSV is the percentage change in non-residents visiting Nova Scotia. ATTRACTIONJ1 is a dummy variable indicating whether or not a global event happened that depressed visitation. One example of such an event would be the September 11, 2001 terrorist attacks. It takes a value of '1' in years in which there was a major global event and '0' otherwise. ATTRACTIONJ2 is a dummy variable indicating whether or not there was a local event that happened that may increase visitation unrelated to World Heritage designation. The variable takes a value of '1' in years in which there was a significant local event and '0' otherwise. Lastly, CAN2EURO is the Canadian to Euro exchange rate. Other factors[4] that influence travel and tourists were explored; however, they were insignificant and due to the relatively small sample size of the data they were excluded from the regression analysis.

3.3.2 Economic Benefit

Using the WHD coefficient, a present benefit of designation can be forecasted. As with Grand Pre, much of the economic benefit is expected value rather than realized, as is the case with Lunenburg. Using a historical average of visitation from 2005 to 2011 for unknown

[4] These factors include the price of crude oil, the inflation rate in Halifax, the inflation rate in Nova Scotia, the inflation rate of the travel price index, and deviations of Canadian real GDP from its trend.

visitation statistics, annual visitation from 2009 to 2024 was forecasted. 2005 to 2011 was used for forecasting annual visitation post-2011 because of the consistently depressed visitation from 2008 onward due, in large part, to a poor economic environment. Including 2005-2007 provided a stronger economic environment and therefore 2005-2011 included both aspects of the business cycle. Using the WHD coefficient, the change in visitation was calculated. Using survey data from 2011, daily per person spending was calculated. The survey conducted at The Joggins Fossil Cliffs, consisted of 150 completed surveys that captured visitor origin, reason for visit, and spending. A value of $73 daily per person was determined and when adjusted for inflation this number reduced to $69 in 2009 dollars. Multiplying $69 by the change in visitation determined the economic benefit of designation for Joggins. A value for economic benefit over 16 years of benefits was then calculated by discounting for the opportunity cost of capital. Once again, 16 years of benefits were calculated for the purposes of comparison between the various designated sites within the scope of this research.

3.4 Miguasha National Park

Miguasha National Park is located in Southeast Quebec on the Gaspe Peninsula. The park contains fossils from the Devonian Period dating back 370 million years ago. The park is significant as it contains the highest number and most well preserved fossils of lobe-finned fish that gave rise to the tetrapods, the first four legged and air breathing terrestrial vertebrates ("Miguasha National Park", 2013). Miguasha National Park was designated as a natural World Heritage site in 1999.

3.4.1 Regression Analysis

Miguasha National Park is an established natural World Heritage site (World Heritage List, 2013). Direct visitation data from the site is available and was used in the regression analysis. However, due to a sudden change in the method of estimating visitation at the site, the

dependent variable used was the percentage change in annual visitation. Additionally, visitation data for the year in which the visitation estimation method changed was omitted. The regression specification for the site is as follows:

$$PCMIGVIS = \beta_0 + \beta_1 WHDMIG + \beta_2 ATTRACTIONM1 + \beta_3 ATTRACTIONM2 + \beta_4 IRMON + \beta_5 \log(CAN2EURO) + \beta_6 HPDEVASPC + u_t$$

PCMIGVIS is the percentage change in annual visitation to Miguasha. WHD_{MIG} is a dummy variable indicating whether or not Miguasha National Park is designated in a specific year. It has the value '1' in years in which the site is designated and '0' otherwise. ATTRACTIONM1 is a dummy variable indicating whether or not a global event happened that might depress visitation. It takes a value of '1' in years in which there was a major global event and '0' otherwise. ATTRACTIONM2 is a dummy variable indicating whether or not there was a local event that increased visitation unrelated to the World Heritage designation. IRMON is the inflation rate in Montreal. CAN2EURO is the exchange rate between the Canadian dollar and the Euro. Lastly, HPDEVASPC is a variable that measures the percentage change in fluctuations in annual Canadian GDP from its trend.

3.4.2 Economic Benefit

The economic benefit calculations follow the process laid out previously. Estimates of daily per person spending come from Miguasha National Park. Their estimate is $16 daily per person. However, this estimate consists only of money spent onsite rather than in the local area. Therefore, spending data from The Joggins Fossil Cliffs is used as a proxy due to the fact that they are similar World Heritage sites and are expected to attract similar types of visitors. Additionally, both sites are rural and located within small towns so spending patterns are expected to be similar. Hence, The Joggins Fossil Cliffs is treated as a proxy for spending for

Miguasha National Park. The $16 estimate was increased to $50 when off-site expenditures were included, using the expenditure breakdown in the survey from The Joggins Fossil Cliffs. This was then adjusted for inflation to $47.7 daily per person in 2009 dollars. To enable comparison 16 years of benefits were used when calculating the present benefit. Given that there are 11 years of known visitation, 5 years had to be forecasted. This was done in the same manner as with The Joggins Fossil Cliffs, where forecasted annual visitation was determined by taking the average of annual visitation from 2005 to 2011.

3.5 Data

The data used in each regression varied depending on availability. For Lunenburg and Miguasha the dependent variables as well as the independent variables were assessed from 1990 to 2011. For Joggins, the dependent and independent variables were assessed from 1994 to 2011. Data for the inflation rates, exchange rate, and annual Canadian GDP were retrieved from Statistics Canada (CANSIM). The various ATTRACTION and WHD variables were dummy variables that took the value '0' in years when the variable did not apply and '1' in years when it did. The descriptive statistics for each of the independent variables can be seen in the Table 1:

Table 1: Descriptive Statistics

Variable	Mean	Min	Max	Standard Deviation
WHDLun	0.727	0	1	0.456
WHDJog	0.222	0	1	0.428
WHDMig	0.619	0	1	0.498
ATTRACTL	0.227	0	1	0.429
ATTRACTJ1	0.222	0	1	0.428
ATTRACTJ2	0.056	0	1	0.236
ATTRACTM1	0.143	0	1	0.359
ATTRACTM2	0.238	0	1	0.436
IRTPI	0.027	0.003	0.076	0.016
IRURBNS	-0.001	-0.003	0.003	0.002
CAN2EURO	0.660	0.534	0.741	0.056
HPDEVASPC	0.040	-0.793	1.274	0.563
HPFILTER	0.037	-0.800	1.258	0.560
PCNRNSV	0.008	-0.067	0.093	0.044
IRMON	0.020	-0.015	0.073	0.016

The mean value for WHD_{LUN} of 0.727 implies that Lunenburg was designated in 72.7% of the years of the sample. The same holds for WHD_{JOG} and WHD_{MIG}. A mean value of 0.227 implies that an event occurred at Lunenburg in 22.7% of the years in the survey.

For purposes of comparison the net present benefit of each of the four designated sites investigated consisted of 16 years of benefits as well as three years prior to designation. This was done to ensure an equal number of years for discounting purposes. For Lunenburg, the economic benefit is a realized value meaning that the benefit has already occurred. With the other three sites some forecasting was needed to ensure 16 years of benefits was realized. For Grand Pre this involved two methods, historical and current. For the Joggins Fossil Cliffs and Miguasha National Park it involved the average of annual visitation from 2005 to 2011.

Chapter 4: Results

4.1 Regression Results

For each of the regressions discussed in the previous chapter we are interested in the coefficients of predictors WHDLUN, WHDJOG, and WHDMIG as they estimate the impact of World Heritage designation on visitation as defined for each specific site.

4.1.1 Lunenburg

Recall that Specification A for Lunenburg focuses solely on non-resident visitors to Nova Scotia that go to Lunenburg. The regression equation is as follows:

$$Y_{LunA} = \beta_0 + \beta_1 WHDLUN + \beta_2 ATTRACTION_L + \beta_3 IRURBNS + \beta_4 IRTPI + \beta_5 \log(CAN2EURO) + \beta_6 HPFILTER + u_t$$

The regression results for Specification A can be seen in Table 2.

Table 2: Old Town Lunenburg Specification A Regression

Dependent Variable: YLUNA
Sample (adjusted): 1991 2011
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.163330	0.791240	3.997941	0.0013
WHDLUN	0.772665	0.242686	3.183806	0.0066
ATTRACTIONL	0.243814	0.236944	1.028991	0.3209
IRURBNS	0.235212	0.137020	1.716627	0.1081
IRTPI	-0.204740	0.093719	-2.184605	0.0464
LOG(CAN2EURO)	-1.408819	1.475665	-0.954701	0.3559
HPFILTER	0.413160	0.247609	1.668597	0.1174

R-squared	0.675651	F-statistic	4.860564
Adjusted R-squared	0.536644	Prob(F-statistic)	0.006991

The WHDLUN coefficient is equal to 0.77 implying that the World Heritage designation has led to a 0.77% increase in the share of non-resident visitors to Nova Scotia that visit

Lunenburg. It is statistically significant at the 5% level. The coefficient maintains the correct sign as suggested by the relevant literature that maintains that designation is expected to lead to an increase in visitation. This value will be applied to non-resident visitation and combined with non-resident daily per person spending data to determine the non-resident economic impact of World Heritage designation for Lunenburg.

$ATTRACTION_L$ has a coefficient value of 0.24. This suggests that in years in which there is a non-World Heritage event in the region the share of non-residents to Lunenburg of all non-resident visitors increases by 0.24%. However, it is statistically insignificant. A possible reason for the insignificance of the variable may be that in years in which the Tall Ships Festival, an event unrelated to the World Heritage designation, occurs in Lunenburg it also occurs in Halifax. Therefore, non-residents may substitute Halifax for Lunenburg when seeing the Tall Ships while in Nova Scotia and thus reduce their ability to draw tourists to Lunenburg. IRURBNS has a coefficient value of 0.24. This implies that for every 1% increase in the inflation rate in Halifax the share of non-residents to Lunenburg of all non-resident visitors to Nova Scotia increases by 0.24%. This captures the substitution effect between Halifax and Lunenburg. When the inflation rate in Halifax increases Halifax becomes relatively more expensive so it is expected that visitors find substitutes. It is almost statistically significant at the 10% level and maintains the correct sign. IRTPI has a coefficient value of -0.205. It is significant at the 5% level and maintains the correct sign. This variable captures changes in the percentage change in the cost of travel as the travel price index is an index composed of goods and services common to tourists. LOG(CAN2EURO) has a coefficient value of -1.41. It is statistically insignificant at the 5% level. HPFILTER has a coefficient value of 0.413. It is statistically insignificant at the 5% level; however, it is almost significant at the 10% level. Furthermore, it maintains the correct sign as the

stronger the Canadian economy the more likely Canadian tourists are to go on vacation and to travel.

Recall that Specification B focuses on non-resident and resident visitors to Nova Scotia that go to Lunenburg. The regression equation is as follows:

$$Y_{LunB} = \beta_0 + \beta_1 WHDLUN + \beta_2 ATTRACTION_L + \beta_3 IRURBNS + \beta_4 IRTPI + \beta_5 \log(CAN2EURO) + \beta_6 HPFILTER + u_t$$

The regression results for specification B can be seen in Table 3.

Table 3: Old Town Lunenburg Specification B Regression

Dependent Variable: YLUNB
Sample (adjusted): 1991 2011
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.969226	0.220789	4.389836	0.0006
WHDLUN	0.326386	0.067719	4.819685	0.0003
ATTRACTIONL	0.124398	0.066117	1.881466	0.0809
IRURBNS	0.082142	0.038234	2.148382	0.0497
IRTPI	-0.045406	0.026152	-1.736245	0.1045
LOG(CAN2EURO)	-0.779630	0.411772	-1.893355	0.0792
HPFILTER	0.132333	0.069093	1.915274	0.0761
R-squared	0.775156	F-statistic		8.044215
Adjusted R-squared	0.678794	Prob(F-statistic)		0.000675

The slope of the WHDLUN coefficient is equal to 0.33 implying that the World Heritage designation has led to a 0.33% increase in the share of non-resident and resident visitors to Lunenburg of all visitors to and within Nova Scotia. It is statistically significant at the 5% level and maintains the correct sign. 0.33% will be applied to total visitation and combined with daily per person spending data to determine the overall economic benefit of the World Heritage designation for Lunenburg. Furthermore, the coefficient is substantially smaller in Specification

B than in Specification A. This is expected as tourists within Nova Scotia have likely already visited Lunenburg and therefore, when they travel they may not be returning. On the other hand, non-resident tourists may have never been to Nova Scotia and therefore, are more likely to visit the main tourist destinations, including Lunenburg.

ATTRACTIONL has a coefficient value of 0.125 and is significant at the 10% level. IRURBNS has a coefficient value of 0.08 and is significant at the 5% level. IRTPI has a coefficient value of -0.045 and is almost significant at the 10% level. LOG(CAN2EURO) has a coefficient value of -0.78 and is significant at 10%. HPFILTER has a coefficient value of 0.13 and is significant at the 10% level.

4.1.2 Joggins

Due to limitations in data, as discussed in section 3.3.1, Fundy Geological Museum visitation was used as a proxy for visitation to the Joggins Fossil Cliffs. The dependent variable for this specification is in annual percentage change. The Joggins regression can be seen in Table 4:

Table 4: The Joggins Fossil Cliffs Regression

Dependent Variable: PCFGM
Sample (adjusted): 1995 2011
Included observations: 17 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.35662	20.33752	0.853428	0.4116
WHDJOG	11.22446	10.77099	1.042101	0.3197
PCNRNSV	2.202452	1.095446	2.010552	0.0695
ATTRACTIONJ1	-1.190155	9.141849	-0.130188	0.8988
ATTRACTIONJ2	-4.165418	14.97775	-0.278107	0.7861
LOG(CAN2EURO)	52.18821	48.03351	1.086496	0.3005

R-squared	0.296763	F-statistic	0.928393
Adjusted R-squared	-0.022890	Prob(F-statistic)	0.498750

The β coefficient for WHDJOG is 11.22. This implies that WHD has led to an 11.22% increase in visitation. The sign of the coefficient is correct as we expected a positive value. However, the variable is insignificant at the 5% level. The reason that this is the case is believed to be the result of closure of the Fundy Geological Museum in 2010. Furthermore, due to the fact that the dependent variable is percentage change, the museum closure also affects 2011. The reason this is the case is that in 2010 when the museum closed for part of the year annual visitation dropped that year. Therefore, the percentage change in visitation fell significantly. In the following year when the museum was open for the entire year visitation returned to normal. However, because the dependent variable is measured in percentage change, it appears that visitation for 2011 increased beyond the normal visitation level when really the increase is just correcting back to the trend. Therefore, two years in which the site was designated out the four years in the sample where affected by an event in the local region unrelated to designation. Hence, it is unsurprising to see this result.

Of the remaining variables only PCNRNSV is significant at the 10% level and it maintains the correct sign as we would expect that as more visitors come to Nova Scotia, visitation to the Fundy Geological Museum would increase. Overall, the model is insignificant given the 0.499 probability value of the F-statistic. The R-squared value of 0.297 suggests the specification does not accurately model the data.

Given the insignificance of the World Heritage designation coefficient, β_{WHDJOG}, for purposes of economic benefit, the value of β_{WHDMIG} will be used as a proxy. Similar to the logic behind our assumption of Grand Pre experiencing a proportional impact to its visitation as Lunenburg, we assume that Joggins will have a proportional impact to its visitation as Miguasha National Park to compute the economic benefit of designation for Joggins. The main logic

behind this assumption is the fact that both Joggins and Miguasha are natural sites that have the same type of exhibit, i.e. fossils, and both sites are located in a rural area that lies away from an urban center. Given the short time period in which Joggins held its designation, in combination with the global recession and the museum closure that coincides with this time period, it is unsurprising to see that regression analysis cannot isolate the impact of the World Heritage designation from these adverse shocks.

4.1.3 Miguasha

The results from the Miguasha regression are seen in Table 5.

Table 5: Miguasha National Park Regression

Dependent Variable: PCMIGVIS
Sample (adjusted): 1992 2011
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.648313	10.11405	-0.360717	0.7246
WHDMIG	6.941261	3.797968	1.827625	0.0926
ATTRACTIONM1	-15.90972	4.631277	-3.435277	0.0049
ATTRACTIONM2	6.791119	4.198518	1.617504	0.1317
IRMON	-5.311276	1.560982	-3.402521	0.0052
LOG(CAN2EURO)	-18.95529	19.81266	-0.956726	0.3576
HPDEVASPC	4.233026	3.814392	1.109751	0.2889
R-squared	0.747531	F-statistic		5.921764
Adjusted R-squared	0.621296	Prob(F-statistic)		0.004459

The β coefficient for WHDMIG is 6.94. This implies that WHD has led to a 6.94% increase in visitation. The sign of the coefficient is correct as we expected a positive value. The variable is insignificant at the 5% level; however, it is significant at the 10% level.

ATTRACTIONM1 represents global events that affected the tourism industry. The variable is significant at the 5% level and maintains the correct sign. Global events in that

particular time period that affected tourism typically depress the industry, such as 9/11, SARS, among others. Therefore, we would expect that in years in which there is a major global event tourism would decline. ATTRACTIONM2 represents local events that affect visitation to Miguasha. The variable is insignificant. IRMON is the inflation rate in Montreal. The logic behind this variable is the same as IRURBNS for the Lunenburg regression. This variable accounts for the substitutability of tourist destinations. The coefficient is -5.31 which implies that a one percent increase in the inflation rate in Montreal will lead to a decline of 5.31% in Miguasha. It is significant at the 5% level. The variable maintains the incorrect sign. However, this is unsurprising given the distance between Montreal and Miguasha. Therefore, it is unlikely to be capturing the substitution effect but rather fluctuations in visitation to Montreal as a higher inflation rate likely means fewer visitors to Montreal and Quebec in general; thus, fewer visitors to Miguasha. LOG(CAN2EURO) and HPDEVASPC are both insignificant. Overall, the model is significant at the 5% level.

4.2 Survey Results

Before determining economic benefit of designation, daily per person spending needed to be determined for all four sites. Additionally, for creating the Lunenburg dependent variables, average length of stay, average party size and the visitors to overnight visitors ratio needed to be determined from these surveys.

4.2.1 Lunenburg

In 2009 a survey was conducted at Old Town Lunenburg. There were a total of 322 respondents. The geographical distribution of the origin of visitors can be seen in Figure 2:

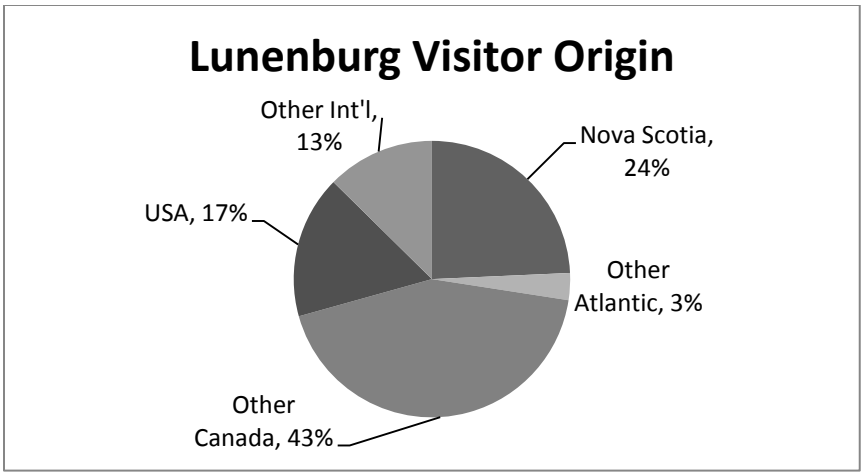

Figure 2: Lunenburg Visitor Origin

Those individuals that are from Nova Scotia are located outside of a 30 minute drive to ensure that they are non-local visitors. Of the respondents the majority were located within Canada (70%) with non-Atlantic Canadians constituting the majority of that group. Nova Scotians represented 24% of the sample, Americans 17% and other international visitors 13%. A breakdown of expenditures by visitors to Lunenburg is seen in Figure 3:

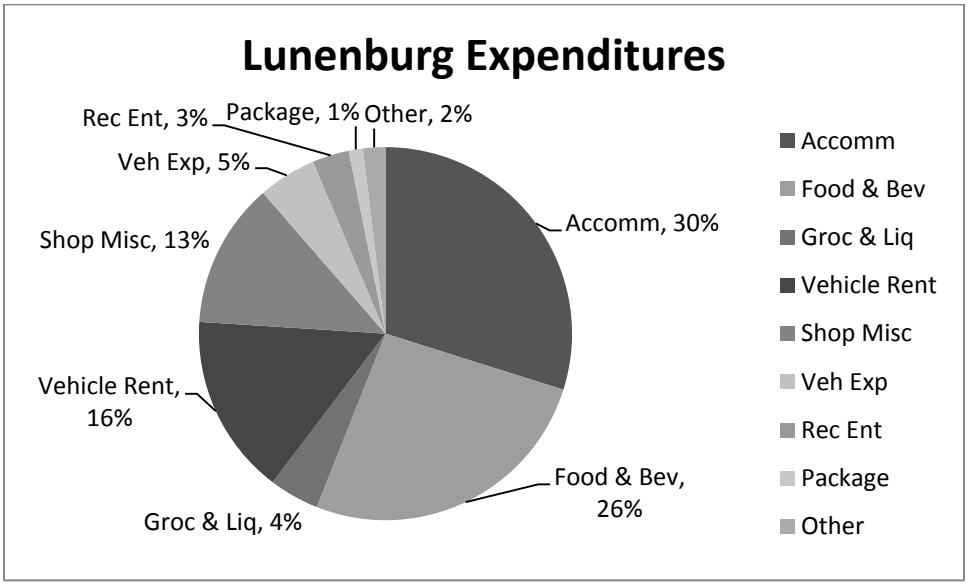

Figure 3: Lunenburg Expenditures

Additional information was necessary for the construction of the Lunenburg dependent variables. This data came from both the 2009 Lunenburg survey as well as the Nova Scotia Exit

Surveys in 2004 and 2010 (Nova Scotia 2005; Nova Scotia, 2011). The relevant data for both are found in the Tables 6 and 7:

Table 6: Lunenburg Survey Results

Relevant Variables	Total	Non-Residents	Residents
Average Party Size	2.21	2.12	2.48
Average Length of Stay (Days)	2.57	2.73	1.88
Visitors to Stayers Ratio	2.36	2.27	2.68

Table 7: Nova Scotia Exit Survey

Relevant Variables	Total	2010	2004
Average Party Size	2.15	2.1	2.2
Average Length of Stay (Days)	2.2	2.3	2.1
Visitors to Stayers Ratio	4.17	4.33	4

A ratio of the 2009 Lunenburg survey data and the Nova Scotia exit survey was used to calculate the final values as laid out in the section 3.1.2. These values are only applicable for Specification B. The final values used can be seen in Table 8:

Table 8: Adjusted Relevant Variables

Specification B	Adjusted Data
Average Party Size	2.24
Average Length of Stay	2.07
Visitors to Overnight Visitors	4.33

4.2.2 Grand Pre

A survey was conducted at Grand Pre in the summer of 2008 and a variety of questions were asked including visitor origin and spending pattern. 281 surveys were completed. Visitor origin to Grand Pre can be seen in Figure 4:

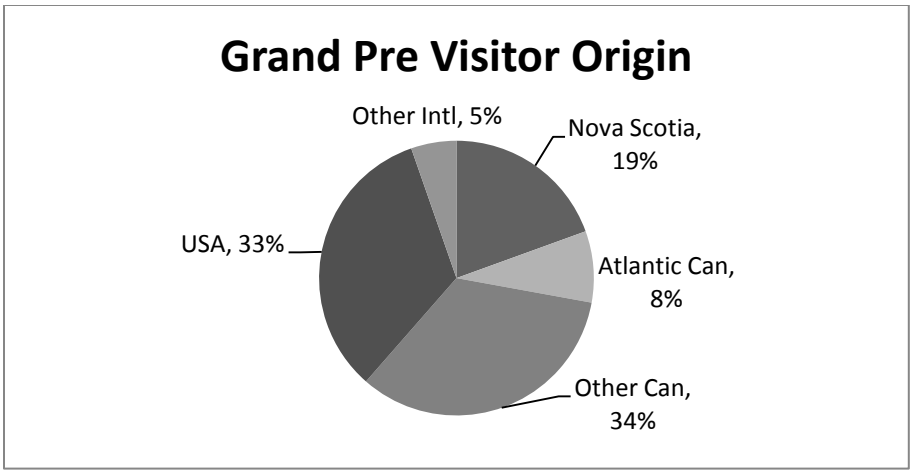

Figure 4: Grand Pre Visitor Origin

The majority of visitors were from non-Atlantic Canada followed closely by the United States. Nova Scotia represented 19% of all visitors. Visitors from New Brunswick, Prince Edward Island, and Newfoundland and Labrador represented just 8% while non-United States international visitors constituted 5%. Expenditure breakdowns can be seen in Figure 5:

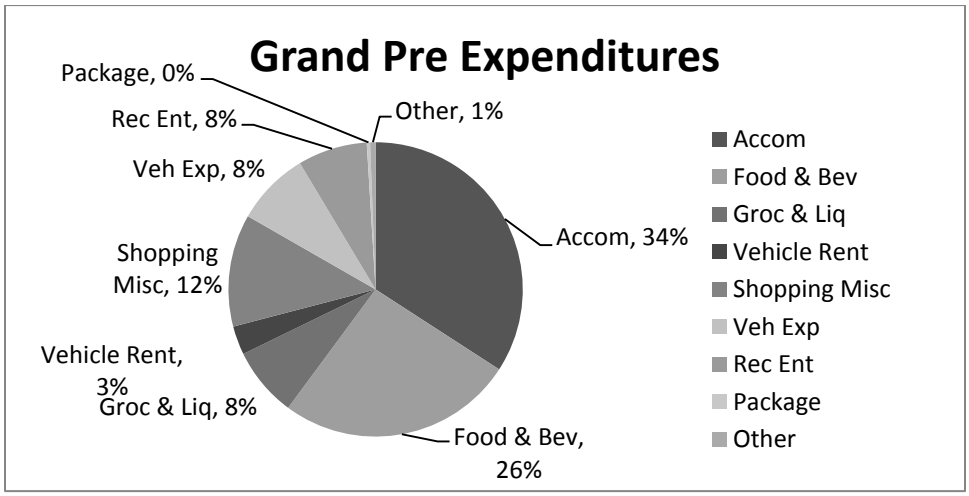

Figure 5: Grand Pre Expenditures

4.2.3 Joggins

A survey was completed at the Joggins Fossil Cliffs in the summer of 2011. Overall, 150 surveys were completed. The survey asked visitors about their origin, party size, average expenditures, and length of stay among others. A breakdown of visitor origin to Joggins can be seen in Figure 6:

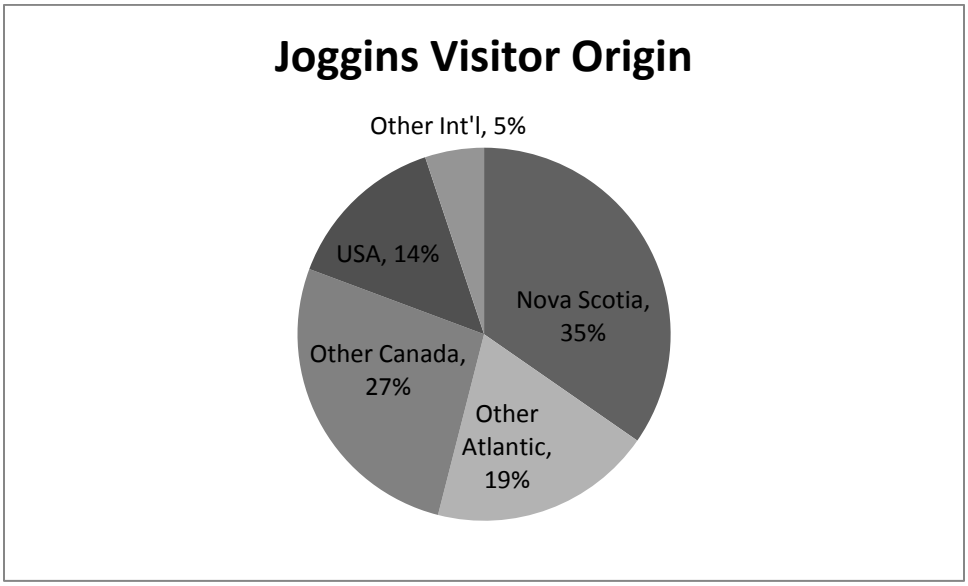

Figure 6: Joggins Visitor Origin

The majority of visitors to Joggins were from Atlantic Canada, with 35% coming from Nova Scotia. It is unsurprising to see a significant difference between Joggins and the other World Heritage sites investigated in Nova Scotia in terms of visitors from non-Nova Scotia Atlantic Canada due to The Joggins Fossil Cliffs' close proximity to the Nova Scotia-New Brunswick border. Due to the fact that Joggins is closer to New Brunswick than Lunenburg and Grand Pre it is expected to see a higher number of non-Nova Scotian visitors to the site. This is reflected in the survey. Visitors from outside of Atlantic Canada constitute 46%. A breakdown of expenditures by visitors can be seen in Figure 7:

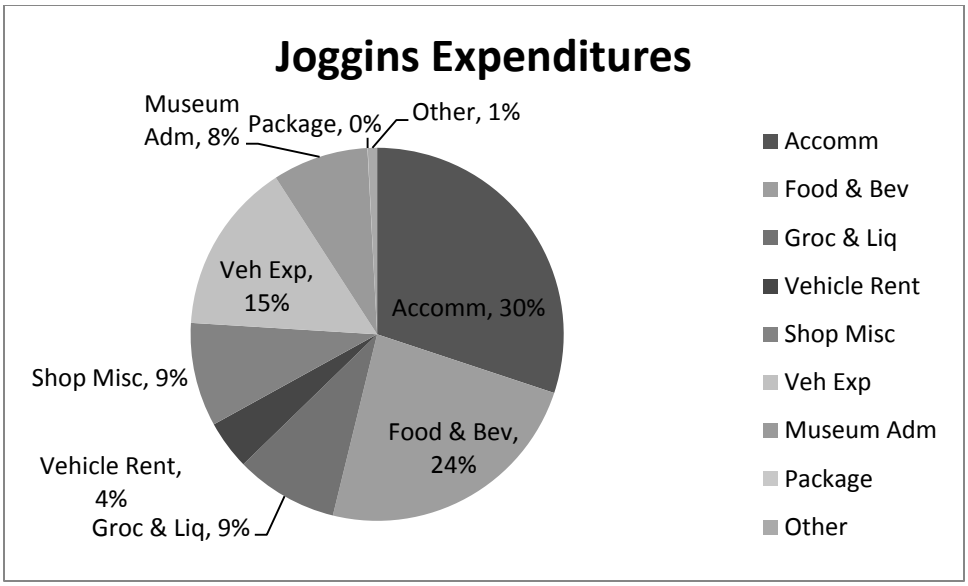

Figure 7: Joggins Expenditures

4.2.4 Daily Per Person Spending

Using spending, length of stay and party size data from each of the sites, data regarding daily per person spending was calculated. These numbers were then adjusted for inflation to be in 2009 dollars so that all economic benefit calculations are done using consistent dollars. It was necessary to use per person spending because the regressions above were conducted using individual visitation rather than party visitation. Daily per person spending for each site can be found in Table 9:

Table 9: Daily Per Person Spending

Location	Spending
Lunenburg- Non-Resident	$ 127
Lunenburg- All visitors	$ 112
Grand Pre	$ 67
Joggins	$ 69
Miguasha	$ 47.7

Lunenburg non-resident spending is relevant for Specification A whereas all visitor average spending is relevant for Specification B. Lunenburg, Grand Pre, and Joggins data were all

determined from surveys. Miguasha spending data was determined using a combination of known museum admission spending from the site and relevant spending in Joggins. For example, because there are no major hotels or motels in the immediate region accommodation spending was excluded as visitors to Miguasha National Park would not have the option to stay overnight whereas visitors to the Joggins Fossil Cliffs did. Thus, a value of $50 daily per person spending for Miguasha National Park was determined from incorporating the $16 spending at the museum in Miguasha as well as average spending on food, gift items and transportation from the Joggins Survey, assuming similar visitor profiles between the sites. When adjusted for inflation daily per person spending is $47.7.

4.3 Present Value of Net Benefits

Cost benefit analysis compares the costs and benefits of a given project or in this case, a site. The costs are the expenses incurred by the site in obtaining World Heritage designation and additional post-designation costs. The benefits are defined as tourism related spending of the additional visitors to the region due to World Heritage designation. In other words, the economic benefits are those benefits that have arisen due to an increase in visitation because of World Heritage designation. Costs and benefits occur at different times with the costs typically occurring pre-designation and the benefits occurring post-designation. Thus, it is necessary to adjust for the opportunity cost of capital. A present value (PV) calculation accounts for this. For some sites, benefits and costs are forecasted to ensure all sites maintain the same number of years in which benefits are realized to ensure comparability between the four sites.

4.3.1 Lunenburg

Table 10 shows the benefits and costs of Lunenburg's World Heritage designation for 1993-2011 for specification A. Table 11 shows the same for specification B.

Table 10: Lunenburg Specification A Net Benefits

Year	Costs (2009 dollars)	Economic Benefit (2009 dollars)	Net Benefits (2009 dollars)
1993	13,692	-	(13,692)
1994	13,532	-	(13,532)
1995	13,360	-	(13,360)
1996	6,559	1,753,359	1,746,800
1997	6,428	1,871,702	1,865,274
1998	121,319	2,046,175	1,924,856
1999	6,281	2,168,639	2,162,358
2000	6,070	2,137,238	2,131,168
2001	5,958	2,103,580	2,097,622
2002	5,785	2,139,593	2,133,808
2003	5,595	2,103,285	2,097,690
2004	5,494	2,166,774	2,161,280
2005	5,347	2,073,945	2,068,598
2006	5,240	2,075,809	2,070,569
2007	5,142	2,099,556	2,094,414
2008	4,991	2,040,876	2,035,885
2009	5,000	2,053,338	2,048,338
2010	4,894	1,917,136	1,912,242
2011	4,715	1,917,037	1,912,322

Table 11: Lunenburg Specification B Net Benefits

Year	Costs (2009 dollars)	Econ Benefit (2009 dollars)	Net Benefits (2009 dollars)
1993	13,692	-	(13,692)
1994	13,532	-	(13,532)
1995	13,360	-	(13,360)
1996	6,559	2,518,636	2,512,077
1997	6,428	2,688,632	2,682,204
1998	121,319	2,671,354	2,550,035
1999	6,281	2,889,292	2,883,011
2000	6,070	2,878,998	2,872,928
2001	5,958	2,854,624	2,848,666
2002	5,785	3,291,271	3,285,486
2003	5,595	2,932,453	2,926,858
2004	5,494	2,925,358	2,919,864
2005	5,347	2,800,029	2,794,682
2006	5,240	3,073,995	3,068,755
2007	5,142	3,036,569	3,031,427
2008	4,991	3,038,481	3,033,490
2009	5,000	3,199,397	3,194,397
2010	4,894	3,341,748	3,336,854
2011	4,715	3,341,577	3,336,862

From 1993-1995 Lunenburg applied for designation and therefore, received no economic benefit from designation. Thus, for this period net benefit was negative. 1996 was first year it realized the economic benefits of designation. The costs for Lunenburg were determined from Haughn (2009) where the cost of application was $30,000 spread over 1993 to 1995. In 1998 Old Town Lunenburg commissioned a comprehensive management plan that cost $95,000. Additionally, for every year of designation an additional cost of the equivalent of $5,000 in 2009 was incurred for general maintenance and upkeep to maintain the site to the quality required by UNESCO.

Assuming a base discount rate of 4%[5], the net present value for Lunenburg specification A is $21.8 million (2009 dollars) and the net present value for Lunenburg specification B is $31.4 million (2009 dollars). This implies that non-residents provide a net economic benefit of $21.8 million whereas the net benefit including residents and non-residents is $31.4 million. These were calculated using the formulae:

$$NPB_A = NPV_A = \sum_{t=0}^{18} \frac{(B_t - C_t)}{(1+r)^t} = \$21.8\ million$$

$$NPB_A = NPV_B = \sum_{t=0}^{18} \frac{(B_t - C_t)}{(1+r)^t} = \$31.4\ million$$

Where ($B_t - C_t$) are net benefits, "t" indicates years from the start, "r" is the discount rate, and n is the number of periods in the time horizon. Therefore, from 1993 to 2011 when just considering non-resident visitors to Nova Scotia and Lunenburg the present value of the benefits outweigh the costs by $21.8 million. When considering both residents and non-residents to and within Nova Scotia visiting Lunenburg the present value outweighs the costs by $31.4 million. Therefore, overall World Heritage designation had a large positive benefit for Lunenburg.

4.3.1.1 Sensitivity Analysis

Table 12 provides a sensitivity analysis for the two Lunenburg models. In both cases discount rates of 2%, 4% and 6% are used where 4% is the base case. In Specification A the World Heritage designation impact on visitation is 0.25, 0.77, and 1.29 where 0.77 is the base case. A confidence interval at the 95% level of confidence was created around the regression estimate of 0.77 to create the lower and upper bounds for a World Heritage designation effect.

[5] For a discussion on discount rates in Canada see Boardman et al. (2009)

Table 12: Sensitivity Analysis Lunenburg (2009 dollars)

LunA	Low	Mid	Upper
r=2	8,472,471	26,411,521	44,350,570
r=4	6,971,929	21,766,573	36,561,217
r=6	5,799,888	18,135,894	30,471,901
LunB	**Low**	**Mid**	**Upper**
r=2	21,147,999	38,279,443	55,410,886
r=4	17,338,720	31,397,611	45,456,502
r=6	14,378,361	26,048,350	37,718,340

Table 12 shows that for Specification A under all discount rates and visitation scenarios the net present value ranges from $5.8 million to $44.4 million. Specification B ranges from $14 million to $55 million. Thus, designation has had a large positive impact for Lunenburg. It should be noted that a large factor of these large net present values is due to the low cost of World Heritage designation when Lunenburg initially applied in 1993. The cost of designation has risen significantly as will be demonstrated for the case of a recent designation in the next subsection.

4.3.2 Grand Pre

Table 13 shows the benefits, costs, and net benefits of designation for Grand Pre. The cost of application was paid from 2008 to 2010, thus the net benefits for those years are negative. The cost of application for Grand Pre was $1.3 million and annual post-designation costs are assumed to be the same as Lunenburg at $5,000 (2009 dollars). Additionally, because Grand Pre was only designated in 2012 it has not realized any of its benefits yet. Therefore, the benefits are estimated using the forecasted visitation models as discussed in Section 3.2.2. Current forecasted visitation of 2011 as future visitation for 2014-2028. Historical used a historical average of visitation from 2005 to 2011 to forecast visitation for 2014-2028. For calculating net present value the years of 2011 and 2012 were excluded to ensure consistency with Lunenburg in which there were three years of costs followed by 16 years of benefits. This

can be done as 2011 and 2012 do not have a net benefit relating to World Heritage designation. It should be noted that the annual cost of maintaining the site is adjusted for inflation each year with forecasted inflation for 2013 onward assuming a constant inflation rate equal to the inflation rate in 2012.

Table 13: Grand Pre Net Benefits

		Economic Benefit (2009 dollars)		Net Benefit (2009 dollars)	
Year	Costs (2009 dollars)	Current	Historical	Current	Historical
2008	432,586	-	-	(432,586)	(432,586)
2009	433,333	-	-	(433,333)	(433,333)
2010	424,168	-	-	(424,168)	(424,168)
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	4,511	312,155	378,593	307,644	374,082
2014	4,412	312,155	378,593	307,743	374,181
2015	4,315	312,155	378,593	307,840	374,278
2016	4,221	312,155	378,593	307,934	374,372
2017	4,128	312,155	378,593	308,027	374,465
2018	4,038	312,155	378,593	308,117	374,555
2019	3,950	312,155	378,593	308,205	374,643
2020	3,863	312,155	378,593	308,292	374,730
2021	3,778	312,155	378,593	308,377	374,815
2022	3,696	312,155	378,593	308,459	374,897
2023	3,615	312,155	378,593	308,540	374,978
2024	3,536	312,155	378,593	308,619	375,057
2025	3,458	312,155	378,593	308,697	375,135
2026	3,383	312,155	378,593	308,772	375,210
2027	3,309	312,155	378,593	308,846	375,284
2028	3,236	312,155	378,593	308,919	375,357

As with Lunenburg, assuming a base discount rate of 4% the forecasted net present value for Grand Pre under the current model is $2.1 million (2009 dollars) and under the historical model is $2.8 million (2009 dollars). Both of these values are forecasted with 16 years of projected benefits so they can be compared with Lunenburg.

4.3.2.1 Sensitivity Analysis

Table 14 provides a sensitivity analysis for Grand Pre using discount rates of 2%, 4%, and 6%. Additionally, World Heritage impact coefficients are 0.25, 0.77, and 1.29. These are numbers from Lunenburg's specification B. Specification B was used as the nature of Grand Pre's available data is both non-resident and resident and therefore A would not be applicable.

Table 14: Sensitivity Analysis Grand Pre (2009 dollars)

Grand Pre			
2008-2028	**Current 16 Years of Projected Benefits**		
	Low	**Mid**	**Upper**
r=2	945,226	2,758,068	4,570,909
r=4	582,852	2,079,358	3,575,865
r=6	303,827	1,553,213	2,802,599
2008-2028	**Historical 16 Years of Projected Benefits**		
	Low	**Mid**	**Upper**
r=2	1,426,434	3,625,115	5,823,795
r=4	980,091	2,795,108	4,610,126
r=6	635,469	2,150,770	3,666,072

Future net present values for Grand Pre using the current projection range from $304,000 to $4.6 million in 2009 dollars. For the historical model, future net present values range from $635,000 to $5.8 million in 2009 dollars. Therefore, Grand Pre can expect positive future benefits from all forecasted scenarios under each of the three discount rates. However, the values are substantially less than those realized by Lunenburg.

4.3.3 Joggins

Due to the fact that both the World Heritage coefficient and the overall model were insignificant, the World Heritage coefficient from Miguasha was used to determine changes in visitation to Joggins and therefore economic benefits, as discussed in section 3.3.2. Table 15 provides the economic benefit and net benefit. The cost of application was $250,000 which

makes up the cost from 2006 to 2008 when adjusted for inflation (Boon, 2011). Annual post-designation costs are assumed to be consistent with Lunenburg and Grand Pre at $5,000 (2009 dollars).

Table 15: Joggins Net Benefits

Year	Costs (2009 dollars)	Economic Benefits (2009 dollars)	Net Benefits (2009 dollars)
2006	87,334	-	(87,334)
2007	85,704	-	(85,704)
2008	83,190	-	(83,190)
2009	5,000	99,345	94,345
2010	4,894	68,751	63,857
2011	4,715	90,831	86,116
2012	4,650	92,614	87,964
2013	4,511	92,614	88,103
2014	4,412	92,614	88,202
2015	4,315	92,614	88,299
2016	4,221	92,614	88,393
2017	4,128	92,614	88,486
2018	4,038	92,614	88,576
2019	3,950	92,614	88,664
2020	3,863	92,614	88,751
2021	3,778	92,614	88,836
2022	3,696	92,614	88,918
2023	3,615	92,614	88,999
2024	3,536	92,614	89,078

Using a discount rate of 4% the forecasted net present value for 16 years of benefits for Joggins is $690,000 (2009 dollars). Once again, 16 years of benefits were forecasted for purposes of comparison. Forecasts for visitation from 2012 to 2024 were done using average annual visitation from 2005 to 2011. This range was chosen as it is recent and includes both portions of the business cycle. Including only the most recent years would include only the trough in the business cycle and thus not represent an accurate picture of expected future visitation.

4.3.3.1 Sensitivity Analysis

Table 16 provides a sensitivity analysis for Joggins using discount rates of 2%, 4%, and 6%. Additionally, World Heritage impact coefficients are 0.12, 6.94, and 13.76. These numbers from Miguasha's regression using a 90% confidence interval around the base of 6.94 to determine the lower and upper World Heritage impact coefficient estimates.

Table 16: Sensitivity Analysis Joggins (2009 dollars)

Joggins			
2006-2024			
	Low	**Mid**	**High**
r=2	(277,200)	884,586	2,046,372
r=4	(268,488)	689,025	1,646,539
r=6	(260,830)	537,275	1,335,381

According to sensitivity analysis for Joggins forecasted net present values range from negative $277,200 to positive $2 million in 2009 dollars. Therefore, in some instances the net present value for Joggins will be negative. This only occurs at the lower bound of the confidence interval calculated.

4.3.4 Miguasha

The cost for Miguasha's application for designation is unknown. Table 17 contains economic benefits as well as net benefits. A daily per person spending value of $47.7 was used for Miguasha. Sixteen years of benefits were used for the net present benefit calculations. For years 2012-2015 an average of annual visitation from 2005 to 2011 was used to forecast. For purposes of comparison, three years were included prior to the initial benefits of designation. This is done to maintain consistency when discounting as all three other sites bore application costs during this period and therefore three years were included.

Table 17: Miguasha Net Benefits

Year	Economic Benefit (2009 dollars)	Net Benefit (2009 dollars)
1997	-	-
1998	-	-
1999	-	-
2000	92,091	92,091
2001	90,680	90,680
2002	81,084	81,084
2003	87,418	87,418
2004	85,266	85,266
2005	89,756	89,756
2006	83,739	83,739
2007	96,373	96,373
2008	80,600	80,600
2009	84,551	84,551
2010	74,961	74,961
2011	69,259	69,259
2012	82,748	82,748
2013	82,748	82,748
2014	82,748	82,748
2015	82,748	82,748

Using a discount rate of 4% the forecasted net present benefit for 16 years of benefits for Miguasha is $913,071 (2009 dollars).

4.3.4.1 Sensitivity Analysis

Table 18 provides a sensitivity analysis for Miguasha using discount rates of 2%, 4%, and 6%. Additionally, World Heritage impact coefficients are 0.12, 6.94, and 13.76. The lower and upper estimates were done using a 90% confidence interval around the mid estimate.

Table 18: Sensitivity Analysis Miguasha (2009 dollars)

Miguasha			
1997-2015			
NPV	**Low**	**Mid**	**Upper**
r=2	27,347	1,102,305	2,177,263
r=4	22,652	913,071	1,803,490
r=6	18,975	764,844	1,510,713

Miguasha's forecasted net present value ranges from $18,975 to $2.2 million in 2009 dollars. While positive these numbers are quite small. Furthermore, when costs are added, these numbers are likely to become even smaller in the case of the mid and upper bounds and negative in the case of the lower bound.

4.4 Comparison

Analyzing the results between the various sites we observe some significant variations. Primarily, Lunenburg has seen a significantly greater discounted economic benefit than any of the other sites investigated. This is unsurprising as Lunenburg sees the most annual visitors. Also, individuals that do go to Lunenburg spend more there than any of the other sites investigated. Grand Pre National Historic Site is forecasted to see a net present value of approximately $2.1 million under current levels of visitation and approximately $2.8 under historic visitation levels. Lunenburg, Grand Pre and Joggins' net present value calculations include the cost of designation, as well as the continued cost of maintaining a designated site to the standards of UNESCO. Joggins and Miguasha are forecasted to realize a smaller net present value of $700,000 and $900,000 respectively. Additionally, Miguasha does not incorporate the cost of designation; therefore, the true net present benefit would be lower when it is factored in, assuming costs are not equal to zero.

As seen in the calculations for net present benefit for each site in this study, the two sites that are historical and cultural figure to have a greater overall economic benefit, and thus, net present benefit, than the natural sites. This may be due to a number of factors. Firstly, there may overall be more culturally inclined tourists than naturally inclined tourists in this study. Secondly, it may be the case that natural sites are typically farther from metropolitan areas than cultural and historical sites. This is the case with the four sites investigated as Grand Pre and Lunenburg are considerably closer to Halifax than Joggins is to Halifax or Miguasha is to Montreal or Quebec City. Therefore, proximity to large metropolitan areas may have a significant effect on net present benefit.

On the other hand, comparing established sites and recent sites is tenuous. Lunenburg, an established World Heritage site, has the greatest net present value for its designation. Miguasha, another established World Heritage site, has a much smaller present value for its designation. Therefore, given our sample of sites it is difficult to say whether established sites or recently designated sites will realize a greater economic value of designation. However, established sites do not rely on predicting future visitation. Thus, if visitation trends decline, it may be possible to draw more meaningful results. For example, if Grand Pre's visitation continues to decline after designation the net present benefit of designation would be significantly less. One of our assumptions for Grand Pre and Joggins were that visitation would remain constant. Thus, a decline in visitation would affect net present benefit forecasts as annual visitation and the change in visitation due to the World Heritage designation would fall.

Lastly, a comparison with the findings of VanBlarcom and Kayahan (2011) is warranted since this study is aimed at expanding upon their results using a longer time period and a more refined specification. They calculated the net present value of Lunenburg's World Heritage

designation for only non-resident visitors to be $36 million (2009 dollars) from 1993 to 2009. In comparison, from 1993 to 2009 we found that the net present value for Lunenburg's designation is $19.8 million (2009 dollars). The difference occurs for two reasons.

Firstly, the authors use the Lunenburg accommodation statistics as is, meaning they did not adjust them for exclusively non-resident visitors. As a result, they are overestimating the number of non-resident visitors to Lunenburg. Therefore, the change in visitation is applied to a greater number which causes it to inflate.

Secondly, the model used in their study accounts for less of the variation in visitation to Lunenburg which means that the β_{WHDLUN} coefficient is inflated. This inflating of the coefficient occurs because extraneous fluctuations are being captured by the β_{WHDLUN} rather than the true source of the fluctuation. Using the new specification, the estimated impact is reduced from 1.24% to 0.77% (VanBlarcom and Kayahan, 2011).

Therefore, the estimated change in visitation due to World Heritage designation is overestimated for two reasons. Firstly, the overall estimated numbers of visitors is greater and the share of non-resident visitors to Nova Scotia that go to Lunenburg as a result of the World Heritage designation is consequently greater. Secondly, the daily per person spending estimate in their study is $143 as opposed to this estimate of $127. Thus, not only are changes in visitation different but so are changes in spending. This leads to a significantly greater economic benefit in their study relative to this one. Hence, it is unsurprising to see a significant difference between the findings presented by VanBlarcom and Kayahan (2011) and those in this research.

Chapter 5: Conclusion

The objective of this paper was to estimate the economic impact associated with a World Heritage designation for Old Town Lunenburg, Grand Pre National Historic site, The Joggins Fossil Cliffs, and Miguasha National Park. In addition, a cost-benefit approach was used to calculate the net present benefit of the designation for each of these sites. Tourism data from the Nova Scotia Exist Survey (Nova Scotia, 2005; Nova Scotia, 2011) as well as surveys conducted at each of the sites (excluding Miguasha) were used for creating the dependent variables as well as determining spending.

Regression analysis, covering the time period in which sites had their designation, calculated the impact of a designation on visitation. A value of 0.77 was estimated for Lunenburg which indicates the percentage change in non-resident visitors to Lunenburg of all visitors to Nova Scotia. Additionally, the change in visitors to Lunenburg as a result of World Heritage designation was calculated to be 18.5% for all visitors. This value was applied to Grand Pre to determine change in visitation. The reasoning for this is due to the similarity between the two sites in terms of type of their World Heritage designations, proximity of them both to Halifax, and motivation behind applying for World Heritage. Additionally, the same process as Lunenburg was applied to Miguasha which found a β_{WHDMIG} coefficient of 6.94. This value is substantially higher than the one from Lunenburg due to fact that the Miguasha dependent variable is measured in percentage change. Due to poor data and uncontrollable events, the value 6.94 was also used for Joggins.

Overall, World Heritage designation is estimated to have a net present value of $21.8 million (2009 dollars) for Lunenburg from 1993 to 2011. This includes 16 years of benefits and just focuses on non-resident visitors. For all visitors to Lunenburg, the net present value

increased to $31.4 million (2009 dollars) from 1993 to 2011. Therefore, the World Heritage designation has led to a significant infusion of money into the town of Lunenburg and surrounding region.

The World Heritage designation for Grand Pre is forecasted to generate a proportional but smaller impact given lower visitation numbers. Due to the fact that designation only occurred in 2012 a realized net present value cannot be calculated. Thus, forecasting was done to include 16 years of projected benefits and then discounted to the present. Using two models for projected visitation over 16 years, the projected net present value for Grand Pre is $2.1 million using current levels and $2.8 million using historical levels in 2009 dollars. Similar to Lunenburg, these values are positive, although they are smaller than those observed in Lunenburg.

The specification estimated using regression analysis for Joggins was insignificant and therefore, the Miguasha β_{WHDMIG} was used as a proxy. World Heritage designation for Joggins is forecasted to generate a net present benefit of approximately $700,000 using 16 years of benefits.

The World Heritage designation for Miguasha is forecasted to generate a net present value of approximately $900,000 excluding costs and projecting 16 years of benefits which required forecasting four of those years. Spending data for Miguasha was determined from the 2011 survey conducted at Joggins in combination with known the museum admission fee at the Miguasha National Park. When costs are included the overall value of designation for Miguasha is expected to decline, perhaps significantly.

Some implications that can be drawn from these findings are that historical and cultural sites appear to benefit more from World Heritage designation than natural sites. Of the four

sites we investigated the two historical and cultural sites appear to benefit the most from designation compared to the natural sites. Furthermore, the addition of the cost of designation for Miguasha would cause this difference to become even more pronounced. While the findings of this research are specific to Eastern Canada and particularly Nova Scotia some of the conclusions may be of interest to prospective applicants for a World Heritage designation. Destinations that are historical and cultural should be more inclined to apply for World Heritage designation than natural destinations as future earnings are expected to be greater. Additionally, sites located nearer to large metropolitan areas, such as Lunenburg and Grand Pre, are expected to benefit a greater amount than those located farther away.

Further research is needed on several fronts. First of all, in several years a regression of Grand Pre should be completed. It was necessary in this research to make several assumptions about Grand Pre, such as a proportional impact from designation. However, the ability to use data specific to Grand Pre would be beneficial. Additionally, conducting a similar study for all sites in the future will be beneficial as the number of observed years of visitation will have increased. This result will be particularly beneficial for Joggins as no significant results were able to be drawn due to an event that skewed a significant amount of post-designation visitation data. Having a greater number of post-designation data will cause this effect to have a smaller impact. Another topic of future research is the expansion of the study horizontally meaning an inclusion of a greater number of designated tourist sites. This will assist in further determining the impact of designation and assist in determining whether cultural and historical sites truly benefit more from designation than natural sites. Lastly, an indirect economic impact analysis could be conducted. An input-output model would allow for the capture of indirect and induced spending.

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