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Impacts of Visitor Spending on the Local Economy

New Bedford Whaling National Historical Park, 2010

Natural Resource Report NPS/NRSS/EQD/NRR—2012/486

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Living history at New Bedford Whaling National Historical Park
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Impacts of Visitor Spending on the Local Economy

New Bedford Whaling National Historical Park, 2010

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Executive Summary

New Bedford Whaling National Historical Park hosted 277,681 recreation visits in 2010. Adjustments for visitor group size and re-entries resulted in 96,550 visitor group trips to the park in 2010. Based on a 2010 Visitor Services Project survey conducted July 25 – August 8, 70% of these visitor group trips were local residents or non-locals on day trips, not including an overnight stay within 10 miles of the park.[1] Fifteen percent of visitor group trips involved an overnight stay in hotels, motels, vacation rentals, B&B, etc. in the local area, and 2% were overnight camping stays in the local area.

Visitors reported their group's expenditures in the city of New Bedford and within 10 miles of the park. The average visitor group size was 2.7 people and spent an average of $132 in the city and local area.

Total visitor spending in 2010 in New Bedford and within 10 miles of the park was $12.8 million. The greatest proportions of expenditures were for restaurants and bars (29%) and overnight accommodations (28%). Overnight visitors staying in hotels, motels, vacation rentals, B&B, etc. in the local area accounted for 51% of total spending, while non-local visitors on day trips accounted for 30%.

Forty-two percent of visitor groups indicated the park visit was the primary reason for their trip to the area. Counting only a portion of visitor expenses if the park visit was not the primary reason for the trip yields $7.0 million in spending attributed directly to the park.

The economic impact of park visitor spending was estimated by applying the spending to an input-output model of the local economy. The local region was defined as a one-county region including Bristol County, Massachusetts. This region roughly coincides with the 10-mile radius around the park for which expenditures were reported.

Including direct and secondary effects, the $7.0 million in visitor spending attributed to the park generates $9.7 million in direct sales in the region, which support 116 jobs. These jobs pay $3.6 million in labor income, which is part of $5.8 million in value added to the region.[2]

A separate study estimated impacts of the park employee payroll on the local economy.[3] The park itself employed 10 people in FY 2010 with a total payroll including benefits of $572,905. Including secondary effects, the local impacts of the park payroll in FY 2010 were $318,000 in sales, supporting 13 jobs, $677,000 in labor income, and $769,000 in value added.

Local Economic Impacts of New Bedford Whaling National Historical Park

	Sales	Jobs	Labor Income	Value Added
Park Visitor Spending	$9.7M	116	$3.6M	$5.8M
Park Payroll	+ $0.3M	+ 13	+ $0.7M	+ $0.8M
Park Visitor Spending + Payroll	$10.0M	129	$4.3M	$6.6M

[1] Results in this study sometimes differ from those reported in the VSP study report (Nussbaum et al. 2011) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.
[2] Jobs include fulltime and part-time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as property income (dividend, royalties, interest and rents) to area businesses and indirect business taxes (sales, property, and excise taxes).
[3] Stynes (2011).

Acknowledgments

The author thanks Dr. Dan Stynes, Professor Emeritus, Michigan State University, for his assistance with MGM2, and Margaret Littlejohn, Visitor Services Project Director, and Marc Manni, Park Studies Unit Research Team Supervisor, for their reviews of an early draft of this report.

Introduction

New Bedford Whaling National Historical Park (NHP) commemorates the heritage of the whaling industry in New Bedford, Massachusetts during the nineteenth century. The 34-acre site dispersed over 15 blocks became a national historical park in 1996. The park is located in Bristol County, Massachusetts. New Bedford Whaling NHP received 277,681 recreation visits in 2010 (Table 1).

Table 1. Recreation visits, New Bedford Whaling NHP, 2010.

Month	Recreation Visits
January	4,634
February	5,236
March	6,684
April	11,284
May	13,008
June	15,081
July	148,845
August	24,338
September	16,600
October	13,502
November	7,192
December	11,277
Total	277,681

Source: NPS Public Use Statistics 2010.

The purpose of this study is to estimate the annual, local economic impacts of visitors to New Bedford Whaling NHP in 2010. Economic impacts are measured as the direct and secondary sales, income, and jobs in the local region resulting from spending by park visitors. (See Appendix A: Glossary for definitions of terms.) In addition, a separate study estimated the impacts of the NPS park payroll on the local region (Stynes 2011), and those results are reported herein. Neither study estimated the economic impacts of park operations or construction spending on the local region.

The local economic region defined for this study includes Bristol County, Massachusetts. This one-county region has a population of 545,210 (USCB 2010), gross regional product of $19.7 billion (MIG, Inc. 2008), median household income of $53,834, and family poverty rate of 8.4% (USCB 2010). Food services and drinking places and wholesale trade businesses are the major employers in the region (MIG, Inc. 2008), and the region experienced an 11.4% unemployment rate in 2010 (BLS 2010).

Methods

The economic impact estimates are produced using the Money Generation Model 2 (MGM2) (Stynes et al. 2007). The three main inputs to the model are:

1. number of visits broken down by lodging-based segments;
2. spending averages for each segment; and
3. economic multipliers for the local region.

Inputs are estimated from the New Bedford Whaling NHP Visitor Services Project (VSP) survey data (Nussbaum et al. 2011), National Park Service Public Use Statistics (2010), and IMPLAN input-output modeling software (MIG, Inc. 2008). The MGM2 model provides a spreadsheet template for combining park use, spending, and regional multipliers to compute changes in sales, labor income, jobs, and value added in the region.

The VSP visitor survey was conducted at New Bedford Whaling NHP from July 25 – August 8, 2010.[4] The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 597 visitor groups. Visitors returned 377 questionnaires resulting in a response rate of 63%.

Spending and economic impact estimates for New Bedford Whaling NHP are based on the 2010 VSP survey data. Visitors were asked to report expenditures in the city of New Bedford and within 10 miles of the park. The local region for determining economic impact was defined as a one-county area around the park including Bristol County in southeastern Massachusetts, which roughly coincides with the 10-mile radius for which visitor spending was reported.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Five segments were established for New Bedford Whaling NHP visitors based on reported trip characteristics and lodging expenditures:

Local: Visitors that are residents of the local region, i.e., in New Bedford and within 10 miles of the park.

Day trip: Visitors from outside the local region, not staying overnight in New Bedford or within 10 miles of the park.

Motel: Visitors reporting motel expenses in New Bedford or within 10 miles of the park.[5]

Camping: Visitors reporting camping expenses in New Bedford or within 10 miles of the park.

Other overnight (Other OVN): Non-local visitors staying overnight in New Bedford or within 10 miles of the park, but not reporting any lodging expenses. This segment includes visitors staying in private homes, with friends or relatives, or in other unpaid lodging. [6]

[4] Results in this study sometimes differ from those reported in the VSP study report (Nussbaum et al. 2011) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.
[5] The questionnaire asked about expenditures for "Hotels, motels, vacation rentals, B&B, etc." For convenience, these expenditures are referred to as "motel" in this report.
[6] Visitors reporting multiple lodging types and expenditures were classified based on the greatest reported lodging expense. Some visitors listing motels or campgrounds as lodging types did not report any lodging expenses and were classified in the other overnight (Other OVN) category.

The VSP survey data were used to estimate the percentage of visitors from each segment as well as spending averages, lengths of stay, and visitor group sizes for each segment.

Results

Visits

Based on the VSP survey data, 68% of park entries were classified as day visits by either residents or visitors from outside the region, and the remaining 32% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.5 to 3.2 people across the five segments with an average visitor group of 2.7 people.[7] The average length of stay in the local region on overnight trips was 2.7 nights.

Table 2. Selected visit/trip characteristics by segment, 2010

	Segment					
Characteristic	**Local**	**Day trip**	**Motel**	**Camping**	**Other OVN**	**All visitors**
Visitor segment share (park entries)*	13%	55%	17%	2%	14%	100%
Average visitor group size	3.2	2.6	2.8	2.5	2.9	2.7
Length of stay (days or nights)	1.0	1.0	2.1	2.2	3.4	2.7
Re-entry rate (park entries per trip)	1.1	1.0	1.1	1.1	1.1	1.1
Percent primary purpose trips	100%	53%	19%	25%	22%	42%

*Segment percentages do not total 100% due to rounding.

Forty-two percent of visitor groups indicated that visiting the park was the primary reason for their trip to the area. Other stated reasons included traveling through, visiting the city of New Bedford, visiting other attractions in the area, visiting friends and relatives, and business.

The 277,681 recreation visits in 2010 were allocated to the five segments using the visit segment shares in Table 2. Because spending is reported for the stay in the area, recreation visits were converted to visitor group trips to the area by dividing recreation visits by the average number of times each visitor entered the park during their stay and the average visitor group size. Visitor groups were asked how many days they visited the park on their trip, and assumed to make one park entry per day. The 277,681 recreation visits represented 96,550 visitor group trips (Table 3).

Table 3. Recreation visits and visitor group trips by segment, 2010

	Segment					
Measure	**Local**	**Day trip**	**Motel**	**Camping**	**Other OVN**	**All visitors**
Recreation visits	35,456	152,800	46,879	4,896	37,651	277,681
Visitor group trips	10,034	58,217	14,775	1,763	11,761	96,550
Percent of visitor group trips*	10%	60%	15%	2%	12%	100%

*Segment percentages do not total 100% due to rounding.

[7] Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP survey.

Visitor Spending

The VSP survey collected data about expenditures of visitor group in the city of New Bedford and within 10 miles of the park. [8] Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent $132 on the trip in New Bedford and within 10 miles of the park (Table 4). On a visitor group trip basis, average spending was $56 for day trips by local residents and $67 for day trips by non-local visitors. Visitor groups staying in motels spent an average of $444 on their trips, and those camping spent an average of $241 on their trips.

Table 4. Average spending by segment (dollars per visitor group per trip)

	Segment					
Expenditures	**Local**	**Day trip**	**Motel**	**Camping**	**Other OVN**	**All visitors***
Motels	0.00	0.00	235.02	0.00	0.00	35.96
Camping fees	0.00	0.00	0.00	88.00	0.00	1.61
Restaurants & bars	25.82	24.55	96.75	40.00	39.07	37.78
Groceries & takeout food	5.15	1.51	11.75	9.09	13.79	5.09
Gas & oil	2.46	5.13	22.19	60.00	12.41	9.35
Local transportation	1.76	1.58	5.16	5.45	6.15	2.77
Admission & fees	9.24	15.65	41.63	23.27	16.86	19.24
Souvenirs & other expenses	11.30	18.09	31.96	15.45	26.60	20.49
Total	**55.72**	**66.51**	**444.46**	**241.27**	**114.88**	**132.31**

***Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average is 15%. A 95% confidence interval for the overall visitor group spending average is therefore $132 plus or minus $20 or between $112 and $152.

[8] Some expenditure categories in the VSP questionnaire were combined for reporting herein and MGM2 analysis. See Appendix B.

On a per night basis, visitor groups staying in motels spent $209 in the local region, and campers spent $111 (Table 5). The average reported per-night lodging expense was $110 for motels and $41 for camping fees.

Table 5. Average spending per night for visitor groups on overnight trips (dollars per visitor group per night)

	Segment		
Expenditures	**Motel**	**Camping**	**Other OVN**
Motels	110.32	0.00	0.00
Camping fees	0.00	40.62	0.00
Restaurants & bars	45.41	18.46	11.53
Groceries & takeout food	5.52	4.20	4.07
Gas & oil	10.42	27.69	3.66
Local transportation	2.42	2.52	1.81
Admission & fees	19.54	10.74	4.97
Souvenirs & other expenses	15.00	7.13	7.84
Total per visitor group per night	**208.62**	**111.36**	**33.89**

Total spending was estimated by multiplying the number of visitor group trips for each segment by the average spending per trip and summing across segments. New Bedford Whaling NHP visitors spent a total of $12.8 million in the local region in 2010 (Table 6). Overnight visitors staying in motels account for 51% of the total spending, while non-local visitors on day trips account for 30%. Restaurant and bar expenses represent 29% of total spending and motel expenses represent 27% (Figure 1).

Table 6. Total visitor spending by segment, 2010 (thousands of dollars)

	Segment					
Expenditures	**Local**	**Day trip**	**Motel**	**Camping**	**Other OVN**	**All visitors**
Motels	0	0	3,472	0	0	3,472
Camping fees	0	0	0	155	0	155
Restaurants & bars	259	1,429	1,430	71	460	3,648
Groceries & takeout food	52	88	174	16	162	492
Gas & oil	25	299	328	106	146	903
Local transportation	18	92	76	10	72	268
Admission & fees	93	911	615	41	198	1,858
Souvenirs & other expenses	113	1,053	472	27	313	1,979
Total	**559**	**3,872**	**6,567**	**425**	**1,351**	**12,774**
Segment Percent of Total*	4%	30%	51%	3%	11%	100%

*Segment percentages do not total 100% due to rounding.

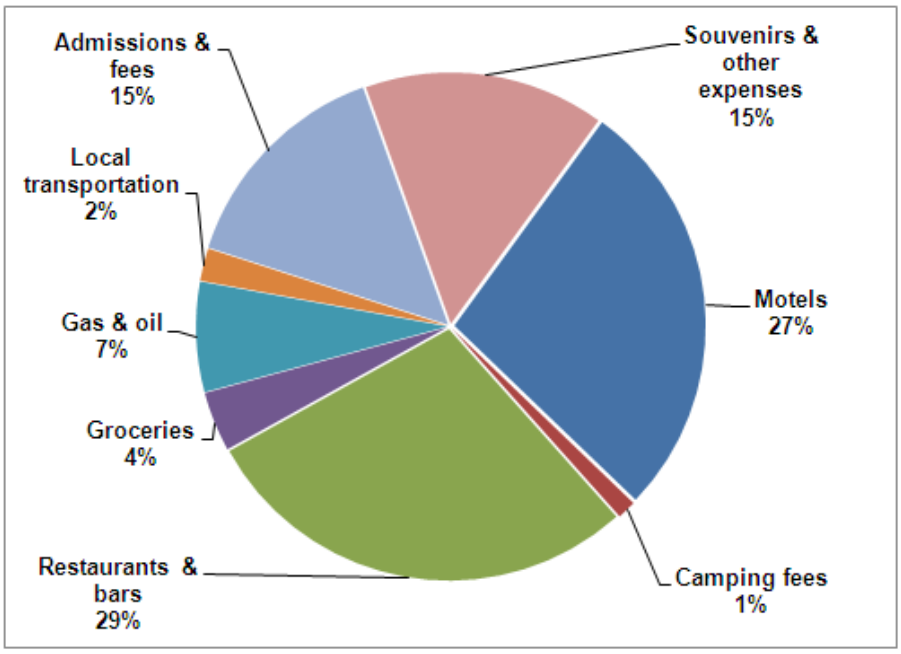

Figure 1. New Bedford Whaling NHP visitor spending by category

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Fifty-eight percent of visitor groups did not make the trip primarily to visit New Bedford Whaling NHP. Spending directly attributed to park visits was estimated by counting all spending on trips for which the park was the primary reason for the trip. If the park was not the primary trip purpose, one night of spending was counted for overnight trips and half of the spending in the region was counted for day trips. With these assumptions, a total of $7.0 million in visitor spending is attributed to the park visit (Table 7). This represents 55% of the overall visitor spending total.

Table 7. Total spending attributed to park visits, 2010 (thousands of dollars)

	Segment					
Expenditures	**Local**	**Day trip**	**Motel**	**Camping**	**Other OVN**	**All visitors**
Motels	0	0	1,983	0	0	1,983
Camping fees	0	0	0	92	0	92
Restaurants & bars	0	1,090	816	42	208	2,156
Groceries & takeout food	0	67	99	10	73	249
Gas & oil	0	228	187	63	66	544
Local transportation	0	70	43	6	33	152
Admission & fees	0	695	125	14	45	879
Souvenirs & other expenses	0	804	96	9	71	980
Total Attributed to Park	**0**	**2,954**	**3,350**	**236**	**496**	**7,037**
Percent of Spending Attributed to the Park	0%	76%	51%	56%	37%	55%
Percent of Attributed Spending	0%	42%	48%	3%	7%	100%

Economic Impacts of Visitor Spending

The economic impacts of New Bedford Whaling NHP visitor spending on the local economy are estimated by applying visitor spending to a set of economic ratios and multipliers in MGM2 representing the economy of the one-county region—Bristol County, Massachusetts.[9] Economic ratios and multipliers for the region were estimated using the *Impact Analysis for Planning (IMPLAN) Professional software* (version 3, MIG, Inc. 2008) with 2008 data.[10] Multipliers were adjusted to take into account price changes from 2008 to 2010 (see Study Limitations and Errors section below).

Not all visitor spending is counted as direct sales to the region. The amount a visitor spends for a retail good is made up of the cost of the good from the producer, a markup by a wholesaler, and a markup by a retailer. In MGM2, retail and wholesale margins for grocery & takeout food, gas & oil, and souvenirs & other expenses are applied to visitor spending to account for mark-ups by retailers and wholesalers. The retail margins for the three sectors are 25.3%, 22.3%, and 50.0%, respectively, and the wholesale margins are 12.3%, 8.3%, and 11.4%. In addition, regional purchase coefficients from IMPLAN for all sectors are used to account for the proportion of demand within the region satisfied by imports into the region.

The tourism output sales multiplier for the region is 1.58. Every dollar of direct sales to visitors generates another $0.58 in secondary sales through indirect and induced effects.[11] (See Appendix A: Glossary for further explanation of terms.)

The economic impacts to the local region are presented in two ways: (1) based on all visitor spending and (2) based only on visitor spending attributable to the park. The first estimate—including all visitor spending—shows the overall contribution park visitors make to the local region. The second estimate—including only visitor spending attributable to the park—shows the impact or contribution the park makes to the economy of the local region.

Impacts of All Visitor Spending

Using all visitor spending and including direct and secondary effects, the $12.8 million spent by park visitors generates $17.6 million in sales, which support 211 jobs in the local region (Table 8). These jobs pay $6.5 million in labor income, which is part of $10.6 million in value added to the region.12

Value added is the preferred measure of the contribution of visitors to the local economy as it includes all sources of income to the area—payroll benefits to workers, profits and rents to businesses, and sales and other indirect business taxes that accrue to government units. Value

[9] Economic ratios convert between various economic measures, e.g., direct spending to the directly associated jobs, labor income, and value added in each sector. Economic multipliers capture the secondary effects of economic measures.
[10] See Appendix C: Economic Ratios and Multipliers for the region.
[11] Indirect effects result from tourism businesses buying goods and services from local firms, while induced effects stem from household spending of income earned from visitor spending.
[12] Jobs include full and part time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as profits and rents to area businesses and sales and excise taxes.

added impacts are also comparable to Gross Regional Product, the broadest measure of total economic activity in a region. The largest direct effects are in restaurants & bars and motels.

Table 8. Impacts of all visitor spending on the local economy, 2010

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	3,472	36	1,085	1,930
Camping fees	155	2	75	74
Restaurants & bars	3,648	65	1,333	1,875
Groceries & takeout food	124	2	64	104
Gas & oil	201	3	103	168
Local transportation	268	5	144	178
Admission & fees	1,858	27	928	1,418
Souvenirs & other expenses	989	19	513	834
Wholesale trade	343	2	130	224
Local production of goods	68	0	16	26
Total Direct Effects	**11,127**	**162**	**4,391**	**6,832**
Secondary Effects	6,461	49	2,141	3,785
Total Effects	**17,588**	**211**	**6,532**	**10,616**

Note: Impacts of $12.8 million in visitor spending reported in Table 6. Totals may not equal sum of individual categories due to rounding.

Impacts of Visitor Spending Attributed to the Park

Using only visitor spending attributable to the park by including only some spending on trips where the primary trip purpose was not to visit New Bedford Whaling NHP reduces the overall impacts by about 45% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the $7.0 million spent by park visitors and attributable to the park generates $9.7 million in sales, which support 116 jobs in the local region. These jobs pay $3.6 million in labor income, which is part of $5.8 million in value added to the region.

Economic Impacts of the NPS Park Payroll

In addition to visitor spending, spending by park employees also impacts the local region. A separate study (Stynes 2011) estimated the impacts of park payroll by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending on local economies. New Bedford Whaling NHP itself employed 10 people in FY 2010 with a total payroll including benefits of $572,905. Including secondary effects, the local impacts of the park payroll in FY 2010 were $318,000 in sales, 13 jobs, $677,000 in labor income, and $769,000 value added (Stynes 2011).

Table 9. Economic impacts of visitor spending attributed to the park, 2010

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	1,983	21	619	1,102
Camping fees	92	1	45	44
Restaurants & bars	2,156	38	788	1,108
Groceries & takeout food	63	1	32	53
Gas & oil	121	2	62	101
Local transportation	152	3	82	101
Admission & fees	879	13	439	671
Souvenirs & other expenses	490	10	254	413
Wholesale trade	178	1	68	116
Local production of goods	34	0	8	13
Total Direct Effects	**6,150**	**89**	**2,397**	**3,724**
Secondary Effects	3,566	27	1,182	2,087
Total Effects	**9,715**	**116**	**3,579**	**5,811**

Note: Impacts of $7.0 million in visitor spending attributed to park reported in Table 7. Totals may not equal sum of individual categories due to rounding.

Combined Economic Impacts

The combined impacts to the region of visitor spending attributable to the park and NPS payroll are $10.0 million in sales, which support 129 jobs with labor income of $4.3 million which is part of a total value added of $6.6 million.

Study Limitations and Errors

The accuracy of the MGM2 estimates rests on the accuracy of three inputs: visits, spending averages, and multipliers. Visits are taken from NPS Public Use Statistics (2010). Recreation visit estimates rely on counting procedures at the park, which may miss some visitors and count others more than once during their visit. Re-entry rates are important to adjust the park visit counts to reflect the number of visitor group trips to the region rather than park entries. Re-entry rates were estimated based on visitor responses to a VSP survey question about the number of days they visited the park. Visitors were assumed to make one park entry per day.

Spending averages are derived from the 2010 New Bedford Whaling NHP VSP survey data (Nussbaum et al. 2011). Estimates from the survey are subject to sampling errors, measurement errors, and potential seasonal/sampling biases. The overall spending average is subject to sampling error of 15%.

Spending averages are also sensitive to decisions about outliers and treatment of missing data. In order to estimate spending averages, incomplete spending data were filled with zeros. Visitor groups of more than 8 people (5 cases), visiting the local region for more than 7 nights (9 cases), or spending greater than $1,260 (the mean plus two times the standard deviation of the mean for spending, 12 cases) were omitted from the analysis. These are conservative assumptions about outliers and likely result in conservative estimates of economic impacts.

The sample only covers visitors during the end of July and beginning of August. To extrapolate to annual totals, it was assumed that this sample represented visitors throughout the year.

Multipliers are derived from an input-output model of the local economy using IMPLAN (MIG, Inc. 2008). The basic assumptions of input-output models are that sectors have homogeneous, fixed and linear production functions, that prices are constant, and that there are no supply constraints. The IMPLAN system uses national average production functions for each of 440 sectors based on the NAICS system (see Appendix B, Table B2). The most recent local IMPLAN datasets available for this analysis were 2008. National IMPLAN multiplier data were available for 2009, so local employment, labor income, and value added multipliers were updated to 2009 using 2008/2009 national ratios. In addition, local employment multipliers were updated to 2010 based on changes in consumer price indices.

Sorting out how much spending to attribute to the park when the park is not the primary reason for the trip is somewhat subjective. Because 58% of visitors to New Bedford Whaling NHP did not make the trip primarily to visit the park and all spending occurs outside the park, adjustments for non-primary purpose trips have a significant effect on the overall spending and impact estimates.

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Appendix A: Glossary

Term	Definition
Direct effects	Changes in sales, income and jobs in those business or agencies that directly receive visitor spending.
Economic multiplier	Captures the size of secondary effects and are usually expressed as a ratio of total effects to direct effects.
Economic ratio	Converts various economic measures from one to another. For example, direct sales can be used to estimate direct effects on jobs, personal income, and value added by applying economic ratios. That is: • Direct jobs = direct sales * jobs to sales ratio • Direct personal income = direct sales * personal income to sales ratio • Direct value added = direct sales * value added to sales ratio.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to visitors, i.e., businesses in the supply chain. For example, linen suppliers benefit from visitor spending at motels.
Induced effects	Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect of visitor spending. For example, motel and linen supply employees live in the region and spend their incomes on housing, groceries, education, clothing and other goods and services. IMPLAN's Social Accounting Matrix (SAM) multipliers also include induced effects resulting from local/state/federal government spending.
Jobs	The number of jobs in the region supported by visitor spending. Job estimates are not full time equivalents, but include both fulltime and part-time positions.
Labor income	Wage and salary income, sole proprietor (business owner) income and employee payroll benefits.
Regional purchase coefficient (RPC)	The proportion of demand within a region supplied by producers within that region.
Retail margin	The markup to the price of a product when a product is sold through a retail trade activity. Retail margin is calculated as sales receipts minus the cost of goods sold.
Sales	Direct sales (retail goods and services) of firms within the region to park visitors.

Term	Definition
Secondary effects	Changes in the economic activity in the region that result from the re-circulation of money spent by visitors. Secondary effects include indirect and induced effects.
Total effects	Sum of direct, indirect and induced effects. • Direct effects accrue largely to tourism-related businesses in the area. • Indirect effects accrue to a broader set of businesses that serve these tourism firms. • Induced effects are distributed widely across a variety of local businesses.
Value added	Labor income plus property income (rents, dividends, royalties, interest) and indirect business taxes. As the name implies, it is the net value added to the region's economy. For example, the value added by a motel includes wages and salaries paid to employees, their payroll benefits, profits of the motel, and sales, property, and other indirect business taxes. The motel's non-labor operating costs such as purchases of supplies and services from other firms are not included as value added by the motel.
Visitor group	A group of people traveling together to visit the park. Visitor group is the basic sampling unit for VSP surveys; each visitor group receives only one questionnaire.
Wholesale margin	The markup to the price of a product when a product is sold through wholesale trade. Wholesale margin is calculated as wholesale sales minus the cost of the goods sold.

Appendix B: Expenditure Sector Assignments

Table B1 shows expenditure categories visitors were asked to estimate in the New Bedford Whaling NHP VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in New Bedford Whaling NHP questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside park	Outside park	MGM2 sector
Hotels, motels, vacations rentals, B&B, etc.		X	Motels
Camping fees and charges		X	Camping fees
Guide fees and charges		X	Admissions & fees
Restaurants and bars		X	Restaurants & bars
Groceries and takeout food		X	Groceries & takeout food
Gas and oil (auto, RV, boat, etc.)		X	Gas & oil
Boat tours		X	Admissions & fees
Other transportation expenses (rental cars, taxis, auto repairs, but NOT airfare)		X	Local transportation
Admission, recreation, entertainment fees		X	Admissions & fees
All other purchases (souvenirs, books, sporting goods, clothing, etc.)		X	Souvenirs & other expenses
Donations		X	Souvenirs & other expenses

X = category included in questionnaire.

MGM2 sectors names correspond to similar sector names and numbers in IMPLAN (Table B2). IMPLAN sectors also correspond to 2007 NAICS sectors.

Table B2. MGM2 sector correspondence to IMPLAN and 2007 NAICS sectors

	IMPLAN		
MGM2 sector	No.	Name	2007 NAICS
Motels	411	Hotels and motels, including casino hotels	72111-2
Camping fees	412	Other accommodations	72119, 7212-3
Restaurants & bars	413	Food services and drinking places	722
Groceries & takeout food	324	Retail - Food and beverage	445
Gas & oil	326	Retail - Gasoline stations	447
Local transportation	336	Transit and ground passenger transportation	485
Admissions & fees	410	Other amusement and recreation industries	71391-3, 71399
Souvenirs & other expenses	329	Retail - General merchandise	452
Local production of goods	317	All other miscellaneous manufacturing	339993, 339995, 339999
Wholesale trade	319	Wholesale trade	42

Source: IMPLAN (MIG, Inc. 2008).

Appendix C: Economic Ratios and Multipliers

Table C1. Economic ratios and multipliers for selected tourism-related sectors, New Bedford Whaling NHP region, 2010

	Direct effects			Total effects multipliers				
Sector	Jobs /$MM sales	Income /sales	Value added/ sales	Sales I	Sales SAM	Job II/ MM sales	Income II/ sales	Value added II/sales
Motel, hotel, cabin or B&B	10.36	0.31	0.56	1.28	1.58	14.84	0.51	0.89
Camping fees	13.15	0.48	0.48	1.36	1.71	18.91	0.73	0.90
Restaurants & bars	17.83	0.37	0.51	1.28	1.57	22.02	0.55	0.85
Groceries & takeout food	18.38	0.51	0.84	1.24	1.59	22.91	0.71	1.19
Gas & oil	12.91	0.51	0.83	1.21	1.47	16.50	0.67	1.11
Local transportation	17.34	0.54	0.67	1.14	1.49	21.32	0.70	0.96
Admission & fees	14.78	0.50	0.76	1.35	1.60	19.29	0.70	1.12
Souvenirs & other expenses	19.69	0.52	0.84	1.24	1.59	24.29	0.71	1.20
Local production of goods	6.11	0.25	0.40	1.23	1.48	9.46	0.41	0.67
Wholesale trade	5.42	0.38	0.65	1.25	1.57	9.85	0.58	1.00

Source: IMPLAN (MIG, Inc. 2008).

Explanation of table

Direct effects are economic ratios to convert sales in each sector to jobs, income and value added.

Jobs/$MM sales is jobs per million dollars in sales.
Income/sales is the percentage of sales going to wages, salaries, and employee benefits.
Value added/sales is the percentage of sales that is value added (Value added covers all income, rents and profits and indirect business taxes).

Total effects are multipliers that capture the total effect relative to direct sales.

Sales I captures only direct and indirect sales.
Sales SAM is the SAM sales multiplier = (direct + indirect + induced sales) /direct sales.
Job II/ MM sales = total jobs (direct + indirect + induced) per $ million in direct sales.
Income II /sales = total income (direct + indirect + induced) per $ of direct sales.
Value added II/sales = total value added (direct + indirect + induced) per $ of direct sales.

Using the motels sector row to illustrate

Direct Effects: Every million dollars in motel sales creates 14.8 jobs in motels. Fifty-six percent of motel sales are value added, including 31% that goes to wages and salaries of motel employees. That means 44% of motel sales goes to purchase inputs by motels (e.g., linens, cleaning supplies). The wage and salary income creates the induced effects and the 44% spent on purchases by the motel starts the rounds of indirect effects.

Multiplier effects: There is an additional 28 cents of indirect sales in the region for every dollar of direct motel sales (type I sales multiplier = 1.28). Total secondary sales are 58 cents per dollar of direct sales, which means 28 cents in indirect effects and 30 cents in induced effects. An additional 4.4 jobs are created from secondary effects of each million dollars in motel sales (14.8

total jobs – 10.4 direct jobs per $million). These jobs are distributed across other sectors of the local economy. Similarly, the secondary effects on income for each dollar of motel sales are 20% (51%-31%), and the secondary effects on value added for each dollar of motel sales are 33% (89%-56%). Including secondary effects, every million dollar of motel sales in the region yields $1.58 million in sales, $510,000 in income, and $890,000 in value added.

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