IMPACT OF VISITOR SPENDING AND PARK OPERATIONS ON THE REGIONAL ECONOMY: VIRGIN ISLANDS NATIONAL PARK

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Virgin Islands National Park

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EXECUTIVE SUMMARY

This study provides an estimate of the regional economic impact resulting from spending by visitors to the Virgin Islands National Park (VINP) in 2003 and park operations in fiscal year 2004. Economic impacts are estimated using the Money Generation Model – Version 2 (MGM2) and the MGM2Operate models, models designed for the National Park Service.[1] The MGM2 model estimates spending, jobs, and income attributable to the park based on the number of visitors to the park, average visitor spending, and regional economic multipliers. For purposes of the visitor spending analysis, the local region is defined as St. John, as the majority of economic impact attributable to the VINP relates to spending on St. John. The MGM2Operate model estimates economic impacts that result from park operations and construction.

In 2003, there were approximately 822,000 recreation visits to VINP, which translates to approximately 274,000 party nights in the area (Table ES-1). The largest segment of visits was day visitors, followed by the villa/condo and hotel segments, respectively. Visitors to the park spent approximately $92 million in the local region. On average, park visitors spend $335 per party per night in the local area. Spending varies depending on lodging segment, ranging from $139 for day visitors to $630 for park visitors staying in hotels. Park visitors staying in hotels, villas and condos on St. John account for over 60 percent of total park visitor spending.

Table ES-1
VINP Visitor Counts and Spending by Segment

	Recreation Visits (1)	Party Nights (2)	Average Spending ($ per party per night)	Total Spending ($ millions) and Percent of Total
Hotel	124,872	50,352	$630	$31.7 (35%)
Villa/Condo	141,756	49,118	$533	$26.2 (28%)
Campground	101,617	29,129	$303	$8.8 (10%)
Boat	117,609	62,892	$217	$13.7 (15%)
Day Visitor	335,828	82,716	$139	$11.5 (13%)
Total	821,681	274,207	$335	$91.9 (100%)

Notes:
(1) Recreation visits generally represent one person entering the park once.
(2) A party night is defined as a travel group staying one night in one area; for day visitors one "party night" is equivalent to one day. Party nights = Recreation visits / re-entry rate / party size * length of stay.

Based on the MGM2 results (Table ES-2), VINP visitors had a direct economic impact on the region of nearly $85 million in direct sales, $31 million in personal income, $45 million in value added, and supported approximately 1,900 jobs in the region. Sales, personal income and value added are independent measures of economic impact and should not be added together. The lodging sector received the largest amount of direct sales ($35 million), followed by restaurants and bars ($18 million) and local transportation ($12 million). To put these figures in context, total visitor expenditures for the U.S. Virgin Islands in 2003 were $1,270.5 million. Thus, VINP visitors account for approximately 7% of direct visitor spending in the U.S. Virgin

[1] The MGM2 Model is a set of Microsoft Excel workbooks for estimating the economic impacts of National Park Service visitor spending on a local region. MGM2Operate is a set of Microsoft Excel workbooks that estimate economic impacts of park operations and construction. Both models were developed by Daniel Stynes and Dennis Propst at Michigan State University and are available on the Internet at: http://prr.msu.edu/mgm2/mgm2main.htm.

Islands overall. In addition, jobs related to VINP visitor spending account for approximately 20% of the reported tourism-related employment in the U.S. Virgin Islands of 8,910 in 2002.[2]

Direct spending results in secondary effects on the regional economy, which generate an additional 520 jobs, $39 million in sales, $14 million in personal income, and $25 million in value added.[3] While direct impacts of visitor spending primarily appear in the lodging, eating and drinking, and transportation sectors, secondary impacts are spread more broadly throughout the economy, resulting from the re-circulation of the money spent by visitors. In total, spending by park visitors generates $45 million in personal income and supports 2,393 jobs in the region.

Table ES-2
Economic Impacts of VINP Visitor Spending

	Direct Sales (1) ($000s)	**Jobs(2)**	**Personal Income(3) ($000s)**	**Value Added(4) ($000s)**
Motel, hotel, or B&B	$34,731	710	$11,328	$17,215
Camping Fees	$3,887	79	$1,268	$1,927
Restaurants and Bars	$18,383	494	$6,261	$8,721
Groceries and Take-out	$2,589	12	$300	$590
Gas and Oil	$104	0	$4	$11
Local Transportation	$11,919	260	$5,981	$7,400
Admissions and Recreation	$4,158	115	$1,439	$2,354
Clothing	$134	2	$29	$34
Souvenirs and Other Expenses	$159	1	$33	$57
Retail Trade	$7,170	184	$3,658	$5,713
Wholesale Trade	$1,269	13	$512	$873
Total Direct Effects	$84,503	1,873	$30,812	$44,895
Secondary Effects	$39,304	520	$14,267	$24,520
Total Effects	$123,807	2,393	$45,079	$69,415
Multiplier(5)	1.47	1.28	1.46	1.55

Notes:
(1) Direct sales are the receipts to firms within the region from tourist spending. Direct sales are less than total spending, as only the retail and wholesale margins on visitor purchases of goods accrue to the local economy.
(2) Job estimates are not full time equivalents as they include part time jobs.
(3) Personal income includes wage and salary income and proprietor's income.
(4) Value added measures the contribution of an industry to gross state product. Value added is personal income + profits and rents + indirect business taxes. Equivalently, value added is total sales - the costs of all non-labor inputs.
(5) Admissions do not include entrance fees paid to the park as these are included in a separate analysis of park operations (See Appendix C).
(6) Multiplier is the ratio of total effects to direct effects. For example, if the sales multiplier is 1.4, $0.40 in secondary sales is generated for every dollar of direct sales.

[2] U.S.V.I. Bureau of Economic Research, U.S. Virgin Islands Annual Tourism Indicators, accessed at http://usviber.org/TOUR03.pdf.
[3] Sales, personal income, and value added are independent measures of economic impact, and should not be added together.

As approximately 80 percent of visitors to the park indicated the park was the primary reason for their visit, the majority of spending and impacts can be directly attributed to the park. However, if the park were closed, not all of this spending would be lost to the region, as many visitors would likely still visit the area. As VINP is an integral part of area tourism, the economic impact of the park must be considered within the broader regional tourism context in the Virgin Islands. Tourism plays a major role in the economy of not just the local St. John region, but the Virgin Islands overall, and additional cooperative research with other tourism partners in the area should be encouraged.

In addition to impacts from visitor spending, regional economic impacts result from park payroll, operations, and construction expenditures. In FY 2004, VINP had 73 annual employees and 5 seasonal employees (annual equivalent). The park payroll was approximately $4.1 million, including $3.2 million in wages and salaries and $0.9 million in benefits. Locally, VINP spent approximately $600,000 on operating expenses (other than payroll expenses) and $350,000 on construction in FY 2004. Based on these expenditures, VINP park operations and construction result in total economic impacts of $3.8 million in sales, 138 jobs, $5.4 million in personal income and $6.4 million in value added. This represents jobs and economic output that would likely not exist without the park. However, it is important to note that the model is static in nature and does not account for adjustments that may occur, such as the subsequent re-employment of workers displaced if the VINP were no longer in existence. Thus, this caveat suggests that the long-run net output and employment effects are likely to be smaller than those estimated by the MGM2Operate model.

As shown in Table ES-3, combining the total impacts of visitor spending and park operations and construction, VINP supports approximately 2,500 jobs in the region and personal income of $50.5 million annually, based on 2003-2004 data.[4] Alternatively, VINP economic impacts can be measured as contribution to sales of $127.6 million, or value added of $75.8 million.

Table ES-3
Total Economic Impacts of VINP(1)

	Direct Sales ($000s)	Jobs	Personal Income ($000s)	Value Added ($000s)
Visitor Spending	$123,807	2,393	$45,079	$69,415
Park Payroll	$2,684	122	$4,994	$5,649
Park Operations (other than Payroll)	$632	8	$210	$409
Park Construction	$512	8	$245	$294
Total Effects	$127,635	2,531	$50,528	$75,767

Notes:
(1) Sales, personal income, and value added are independent measures of economic impact, and should not be added together.

[4] Visitor spending impacts are based on calendar year 2003 data, while park operations and construction impacts are based on FY 2004 data. Because FY 2004 data overlaps 2003-2004, results have not been adjusted.

I. INTRODUCTION

The purpose of this study is to provide an estimate of the regional economic impact resulting from spending by visitors to the Virgin Islands National Park (VINP) in 2003 and park operations in fiscal year 2004. The main body of this report focuses on economic impacts of visitor spending. Information on the regional economic impacts of park operations and construction are presented in Appendix C.

Based on information on the number of visits to the park, average spending for visitors, and regional economic multipliers, regional economic impact of visitor spending is estimated using the Money Generation Model – Version 2 (MGM2), a model designed for the National Park Service.[5] Economic impacts are measured as direct and secondary sales, income, and jobs in the local area that result from spending by park visitors. For purposes of this analysis, the local region is defined as St. John. This analysis incorporates information from the National Park Public Use Statistics and spending information gathered during a March 2004 survey of VINP visitors.[6] Multipliers are based on generic profiles provided in the MGM2 model.

MGM2 Description

MGM2 is a spreadsheet model designed to estimate spending by park visitors in the local region by multiplying the number of visitors (in party nights) by an average spending profile (per party night). Visitors are divided into distinct segments to capture different spending patterns of day visitors versus overnight visitors. Overnight visitors are further divided into those staying in campgrounds, hotels, villas/condos, or on boats. Visitor spending is distributed to various spending categories. Sector-specific multipliers for the local region are then applied to convert spending to the associated direct sales, jobs and income. In addition, multipliers are used to calculate secondary effects from the circulation of spending within the local economy.

Regional Economic Impact Analyses

Input-output models (like the MGM2 model employed in this analysis) are the standard tool for conducting regional economic analyses. These models calculate regional impacts through the use of "multipliers" or values that describe the magnitude of an industry's influence on regional economic output and employment. A multiplier of 1.7 for the hotel industry, for example, indicates that for every $1 of output generated by a hotel, $1.70 is generated in total via this hotel's linkages to other business entities in the region.

[5] The MGM2 Model is a set of Microsoft Excel workbooks for estimating the economic impacts of National Park Service visitor spending on a local region. MGM2 was developed by Daniel Stynes and Dennis Propst at Michigan State University. The model and associated information are available on the Internet at: http://prr.msu.edu/mgm2/mgm2main.htm. To provide information consistent with similar studies for other parks, this report follows the structure of other reports presenting economic impact results of the MGM2 model for parks including Badlands, Crater Lake, and Olympic National Parks. These reports, authored by Daniel Stynes, Dennis Propst and Ya-Yen Sun, are cited in the reference list.

[6] 2004 spending has not been adjusted to 2003 to match visitor count data since the analysis covers the 2003-2004 tourism season.

II. BACKGROUND

Virgin Islands National Park

VINP is located on the island of St. John, the least developed of the three main U.S. Virgin Islands. Over half of St. John (approximately 7,890 acres of terrestrial land) is national park land. The park was created in 1956 when Rockefeller interests donated the land for creation of a national park. The park was enlarged in 1962 to include 5,650 acres of submerged lands. In 1998, then President Clinton declared 12,708 acres of submerged lands around St. John as the Coral Reef National Monument, to be managed by the park. VINP works to preserve the area's natural and cultural resources while providing recreational opportunities. Visitors come to the VINP from all over the world.

Figure 1. Virgin Islands National Park Map

Source: http://gorp.away.com/gorp/resource/us_national_park/vi/hik_vi.htm#map

The gateway to VINP is Cruz Bay, the main town of St. John. There are two lodging facilities inside the park. Historic Caneel Bay provides 166 luxury hotel rooms with room rates ranging from $325 to $1,100 per night in 2004, while Cinnamon Bay Campground provides 126 units, with 40 cottages ranging from $110 - $140 per night, 76 platform tents ranging from $58 - $80 per night and 10 bare sites for $27 per night in 2004. Typically, Cinnamon Bay Campground closes for the month of September, the peak of hurricane season and slow season. In addition, VINP has over 200 moorings installed for overnight and day boating use. In 2004, the VINP mooring fees were $15 per night for boats using moorings overnight.

Total recreation visits to VINP in year 2003 were 821,681 (Table 1). In 2003, the park reported nearly 220,000 overnight stays in the park, including 45,523 visitors staying at Cinnamon Bay and over 170,000 staying on boats in the park. 60 percent of recreational visits and 70 percent of recreational overnight stays in the park were reported in the peak season from December to May.

Table 1 VINP 2003 Visitor Count Data			
		Total Overnight Stays in the Park (1)	
Month	Total Recreation Visits	Cinnamon Bay Campground	Boats (2)
January	82,691	5,454	20,306
February	82,608	7,216	18,475
March	102,881	9,045	28,743
April	79,850	5,621	18,816
May	85,747	4,346	17,741
June	66,813	5,219	14,356
July	60,407	1,212	15,245
August	86,612	1,639	10,267
September	28.012	0	5,361
October	35,792	38	5,517
November	47,960	77	7,152
December	62,304	5,656	10,975
Totals	821,681	45,523	172,954

Source: National Park Service, Monthly Public Use Reports, available at http://www2.nature.nps.gov/mpur.

Notes:

(1) Overnight stays reported by the National Park Service in the monthly public use figures do not include guests staying at Caneel Bay (89,433 in 2003) or at Maho Bay Campground (56,094 in 2003).

(2) For boat visitors, figures are based on periodic ranger observations, adjusted to account for missed boats and number of days in a month, and assuming five persons per boat.

Region

VINP is located primarily on the island of St. John. More than half of St. John is national park land; the remainder of the island consists of one main town, various settlements and undeveloped territorial or private land. According to the 2000 U.S. Census, the population of St. John was nearly 4,200 with a median household income of $32,482. Approximately one-third of the 2,460 employed civilian population of St. John is employed in the arts, entertainment, recreation, accommodation, and food services sector, while 12 percent are in the construction sector and 10 percent are in the retail trade sector.[7] While spending by visitors to the park will primarily impact St. John, most economic indicator statistics combine St. John with the larger more developed neighboring island of St. Thomas (population 51,181 in 2000) in order to avoid data disclosure. Based on the most recent Economic Census of Outlying Areas for the Virgin Islands in 1997, the retail trade industry sector is the leading industry sector in the St. Thomas-St. John economy, representing over of half of sales and receipts and establishments within the businesses represented (see Table 2). The service industry sector was the second largest.

The island of St. John has been developing rapidly over the past ten years, with significant growth in the real estate and construction industries. In 1992, only 18 homes were sold, with an average price of $363,750, while in 2003, a total of 50 homes were sold with an

[7] U.S. Census Bureau, Population and Housing Profile: 2000, Geography: St. John Island.

average price of $964,436.[8] This is significantly higher than prices on the other U.S. Virgin Islands; average home sales price in 2003 was $546,488 for St. Thomas/St. John combined, and $330,557 for St. Croix.[9] While many factors influence property values, the existence of the VINP may impact property values on St. John. The park constrains the amount of privately available property on St. John, and may also affect demand for property on St. John, which in turn increases price. Real estate agents confirm that properties next to the park are easier to sell, properties next to the park generally sell for higher prices; and real estate advertisements may highlight proximity to the park as a property feature.[10] However, to determine property value impacts would require additional research beyond the scope of this report.

Table 2
1997 Economic Census Data: St. Thomas and St. John

Sector	Establishments	Sales/Receipts ($000s)	Workforce (1)
Construction	122	110,601	1,475
Manufacturing	37	39,326	400
Wholesale Trade	75	193,155	830
Retail Trade	650	771,353	6,120
Service Industries	426	496,157	4,721
Total	1,310	1,610,592	13,546

Source: U.S. Census Bureau, 1997 Economic Census of Outlying Areas, Virgin Islands. Available on the web at http://www.census.gov/prod/ec97/oa97e-5.pdf.
Notes:
(1) Workforce includes paid employees (as of March 12) and Proprietors and Partners.

VINP 2004 Visitor Spending Survey

A park visitor study was conducted in the park from March 21 through March 28, 2004.[11] Surveys were conducted at nine locations in the park, including Trunk Bay, Annaberg Sugar Mill, Boats on moorings, Cruz Bay Visitor Center, Hawksnest Bay, Cinnamon Bay, Maho Bay, Salt Pond Bay, and Francis Bay. This study was performed to gather information on visit length, lodging choices, and travel expenditures. Face-to-face interviews were conducted by a team of volunteers from the Friends of the Virgin Islands National Park. A total of 288 parties were contacted. Of these, 260 completed surveys, for a 90 percent response rate. See Appendix A for a summary of survey results.

[8] St. John Tradewinds. 2003. "St. John Real Estate Sales History," St. John *Tradewinds*, December 8-14, 2003.
[9] U.S.V.I. Bureau of Economic Research, U.S. Virgin Islands Annual Tourism Indicators, accessed at http://usviber.org/Tour03.pdf; data for St. Thomas alone was not readily available.
[10] Email communication with Christie O'Neill, Holiday Homes, July 16, 2004, and Roger Harland, Tropical Properties, July 22, 2004.
[11] Israel, Jane. 2004. Virgin Islands National Park Visitor Spending Survey Summary Report. Prepared for the Friends of the Virgin Islands National Park. Revised June 2004. Attached here as Appendix A.

III. MGM2 VISITOR SEGMENTS

For purposes of this analysis, visitors to VINP were divided into five segments representing differences in spending patterns based on lodging type. Segments were chosen based on park use statistics and characteristics of each segment were determined based on the 2004 VINP Visitor Spending Survey. The five visitor segments include:

- Hotel
- Villa/Condo (also includes those staying at Harmony studios at Maho Bay and at Concordia)
- Campground (includes visitors staying at Cinnamon Bay or Maho Bay Campgrounds)
- Boat
- Day Visitors

Monthly public use reports published by the National Park Service provide the best available information on visitors to VINP. These reports provide the number of recreation visits to VINP. The allocation of total recreation visits to the five visitor segments is based on special use data provided in the NPS monthly public use reports, as well as discussions with VINP staff. While special use data is available to accurately allocate visits to campgrounds, boats, and Caneel Bay, the allocation of remaining visits to the hotel, villa/condo, and day visitor segments is less certain. However, available data on cruise ship visitors on tours to the park and Incidental Business Permit (IBP) holders were used to validate estimates of day visitors.[12] Comparison with information on the number of hotel rooms and rental villas/condos was used to verify the reasonableness of estimates of visits in those segments.[13]

Visitors' spending is dependent upon how long they stay in the area, rather than how much time they spend in the park or how many times they enter the park. Monthly public use statistics count recreation visits to the park, which generally represent one person entering the park once. For purposes of this analysis, recreation visits are converted to party nights using information on travel patterns from the visitor surveys.[14] Specifically, for each lodging type, several characteristics were determined from the visitor surveys, including: average number of entries into the park, average length of stay in the area (for overnight visitors), and average party size. These characteristics are summarized in Table 3. Total party nights and spending are sensitive to the length of stay, party size, and re-entry factors. Length of stay indicates how many nights of spending will be estimated for each visitor party. Re-entry factors correct for

[12] In 2003, there were approximately 106,000 visitors on tours to Annaberg or Trunk Bay, which are likely all from cruise ships (data provided by Christina Admiral, VINP, July 14, 2004). In addition, 50 vessels with capacities ranging from 6 to 130 passengers have IBPs; these vessels likely visit the park at least 2-3 times a week in season (data provided by Elba Richardson, VINP, July 9, 2004).

[13] Virgin Islands Department of Tourism. 2003. Rate Sheet Winter & Spring 2002-2003, America's Caribbean, United States Virgin Islands, St. Croix, St. John, St. Thomas. The Westin and Caneel Bay have a total of 349 and 166 rooms, respectively, and there are over 300 villas/condos for rent on St. John. Based on 2003 occupancy rates of 81% and 71% for the Westin and Caneel, respectively (personal communication with hotel managers), this equates to over 146,000 party nights at the Westin and Caneel. Based on 62% occupancy (from USVI BER tourism statistics for St. Thomas/St. John) this equates to approximately 68,000 party nights at villas.

[14] A party night is defined as a travel group staying one night in one area; for day trips one "party night" is equivalent to one party day.

multiple counting of the same visitors. Length of stay in the area ranged from one to 15 days for visitor parties in the survey. Party size ranged from three to four persons depending on lodging segment. The number of entries to the park during a stay (re-entry rate) ranged from one to 11, depending on lodging segment.

Table 3
Travel Patterns by Visitor Segment

	Hotel	Villa/ Condo	Campground	Boat	Day Visitor
Length of Stay in Region	6	15	7	4	1
Party Size	3.1	3.9	3.7	3.4	2.9
Re-entries into Park	4.8	11.1	6.6	2.2	1.4
Number of Cases (1)	28	65	58	45	69

Notes:
(1) Number of cases refers to the number of surveys used to calculate results for this segment. Cases reporting multiple lodging types were allocated to segments based on reported length of stay at each lodging type. Omitted cases include those with missing data and data outliers (e.g., visitor parties with party size of 10 or greater).
Source: 2004 VINP Visitor Spending Survey; see Appendix A for details.

Based on these conversion factors, VINP recreation visits were converted into party nights for each lodging segment as follows:

- **Step 1: Calculate Person Trips.** Person trips are equal to recreation visits divided by the number of entries to the park during trip.

- **Step 2: Calculate Person Nights in the Area.** Person nights were calculated by multiplying person trips by the length of stay.

- **Step 3: Calculate Party Nights.** Party nights were calculated by dividing person nights by average party size.

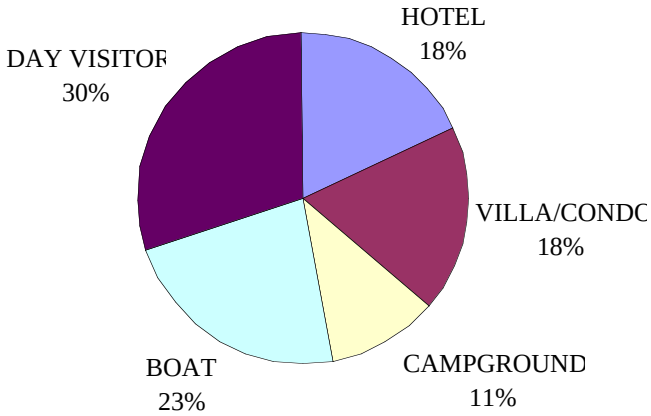
Table 4
Visit Measures by VINP Visitor Segment

	Hotel	Villa/ Condo	Campground	Boat	Day Visitor	Total
Recreation Visits	124,872	141,756	101,617	117,609	335,828	821,681
Person Trips(1)	26,015	12,771	15,397	53,459	239,877	347,518
Person Nights(2)	156,090	191,562	107,776	213,834	239,877	909,138
Party Nights(3)	50,352	49,118	29,129	62,892	82,716	274,207
Percent of Recreation Visits	15%	17%	12%	14%	41%	100%
Percent of Person Trips	7%	4%	4%	15%	69%	100%
Percent of Person Nights	17%	21%	12%	24%	26%	100%
Percent of Party Nights	18%	18%	11%	23%	30%	100%

Notes:
(1) Person Trip = Recreation visits/ re-entry rate
(2) Person Nights = Person trip * length of stay
(3) Party Nights = Person nights / party size

In total, 821,681 recreational visits were converted into 274,207 party nights in the area in 2003. This analysis estimates that day visitors accounted for 30 percent of party nights, while boat visitors made up approximately 23 percent, villa/condo and hotel segment made up 18 percent each, and campground 11 percent (Table 4). The analysis estimates that VINP visitors accounted for approximately 50,000 room nights in hotels, 49,000 nights in rental villas or condos, and 29,000 camping nights on St. John in 2003.

Figure 2. Party Nights by Lodging Segmen



IV. VISITOR SPENDING

Average spending was estimated from the 2004 VINP Visitor Spending Study. Average spending was computed on a per-party per-night basis for each visitor segment. The survey covered expenditures that occurred on St. John.[15] Average spending was reduced by four percent across all segments to adjust for the peak-season bias in the sample.[16] Average spending by visitor segment is shown in Table 5.

[15] Spending for transportation to/from St. John via ferry or barge was also included in the spending averages.
[16] Based on discussions with retail store owners and a review of hotel room rates and villa rental rates, retail and lodging spending is reduced by approximately 30 - 50% in the off-season. However, costs for food and transportation do not vary by season, and party sizes may be larger in the off-season. Thus, this analysis assumes that visitors during the off-season (May – November) spend 10% less on average than peak-season visitors. As about 40 percent of VINP visitors come in off-season, annual averages are reduced by 4 percent.

Table 5 Average Spending by Visitor Segment (dollars per Party Night)					
Spending Category	**Hotel**	**Villa/ Condo**	**Campground**	**Boat**	**Day Visitor**
Motel, hotel, or B&B	$405	$292	$-	$-	$-
Camping Fees	$-	$-	$133	$-	$-
Restaurants and Bars	$119	$81	$65	$54	$38
Groceries and Take-out	$14	$35	$15	$49	$3
Gas and Oil	$2	$4	$2	$13	$2
Local Transportation	$32	$52	$34	$51	$44
Admissions & Recreation Fees	$24	$26	$24	$2	$11
Clothing Purchases	$12	$14	$10	$19	$16
Souvenirs and Other Expenses	$22	$30	$19	$31	$26
Total Spending(1)	**$630**	**$533**	**$303**	**$217**	**$139**

Source: 2004 VINP Visitor Spending Survey; see Appendix A for details.
Notes:
(1) Total spending shown here represents the sum of average spending in each category for each lodging segment, rather than the average of total spending per party reported in the survey results.

Based on the results of the 2004 VINP Visitor Spending Survey, hotel visitors spent the most on a party night basis, with total average spending of approximately $630 per party night. Hotel visitors average spending for lodging was $405 per party night, corresponding with hotel room rates ranging from $300 – $1,100 per night on St. John, depending on the season and hotel.[17] Villa/condo visitors spent $533 on average per party night. Campground visitors average spending was approximately $303 per party night, of which $133 was for campground fees. Boat visitors spent approximately $217 per party night on average, while day visitors to VINP spent approximately $139 on average per party night.

A 1997 study of visitors to VINP indicated that the average visitor group expenditure was $1,506 (however, the median visitor group expenditure was $400), while one-third of visitor groups spent more than $1,400 during their stay. The average per capita expenditure was $495.[18] Because the 1997 study did not include information on length of stay or party size, it is not meaningful to compare these results to the average spending per party night from the 2004 VINP Visitor Spending Survey.

Total visitor spending (shown in Table 6) is calculated by multiplying the number of party nights by average spending for that visitor segment. The calculations are carried out segment by segment, summing across the segments to obtain the total direct visitor spending.

[17] Based on quoted rates for the Westin and Caneel Bay Resorts for 2004; $1,100 is for Cottage 7 at Caneel Bay.
[18] Littlejohn, Margaret. 1997. Virgin Islands National Park Visitor Study, Spring 1997. Visitor Services Project Report #93. Visitor Services Project Report 93. Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit. November 1997.

Table 6 Total Spending by Visitor Segment ($000s)						
Spending Category	**Hotel**	**Villa/ Condo**	**Campground**	**Boat**	**Day Visitor**	**Total**
Motel, hotel, or B&B	$20,396	$14,335	$0	$0	$0	$34,731
Camping Fees	$0	$0	$3,887	$0	$0	$3,887
Restaurants and Bars	$5,969	$3,961	$1,902	$3,375	$3,176	$18,383
Groceries and Take-out	$727	$1,698	$447	$3,104	$238	$6,213
Gas and Oil	$124	$189	$56	$802	$132	$1,302
Local Transportation	$1,592	$2,546	$983	$3,192	$3,607	$11,919
Admissions & Recreation Fees	$1,211	$1,273	$699	$101	$873	$4,158
Clothing Purchases	$596	$707	$280	$1,176	$1,350	$4,109
Souvenirs and Other Expenses	$1,106	$1,462	$559	$1,925	$2,144	$7,197
Total Spending	**$31,723**	**$26,170**	**$8,813**	**$13,674**	**$11,520**	**$91,900**
Percent of Total	**35%**	**28%**	**10%**	**15%**	**13%**	**100%**

Visitors to VINP in 2003 spent approximately $92 million in the local area (Table 6). Of this, nearly $35 million was spent on hotel rooms or villa/condo lodging, over $18 million was spent on restaurants and bars, and approximately $12 million was spent on local transportation. In comparison, for St. Thomas and St. John in 1997, hotels and other lodging places had approximately $95 million in sales and receipts, and eating and drinking places had over $65 million in sales.[19]

V. ECONOMIC IMPACTS OF VISITOR SPENDING

The $92 million spent by VINP visitors results in a direct economic impact on the region of nearly $85 million in direct sales (after adjusting for spending that leaks out of the local region). Visitor spending also directly supports approximately $31 million in personal income (wages and salaries generated in the local region), and 1,900 jobs in the region, as well as $45 million in value added (a measure of the contribution to gross state product) (Table 7).[20] Direct effects are the changes in sales, income and jobs in those businesses that directly receive visitor spending.

Direct sales are less than total spending, as only the retail and wholesale margins on visitor purchases of goods accrue to the local economy. The MGM2 model indicates that the local region captures approximately 90 percent of visitor spending on St. John. Approximately 10 percent of total visitor spending leaks out of the local economy to cover the costs of imported goods bought by visitors.[21]

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[19] U.S. Census Bureau. 1999. 1997 Economic Census of Outlying Areas: Virgin Islands. Accessed at http://www.census.gov/prod/ec97/oa97e-5.pdf. Information for St. John alone is not available; however, a review of hotel rooms, room rates and occupancy levels for St. John indicates that lodging spending of $35 million is a reasonable figure.

[20] Sales, personal income, and value added are independent measures of economic impact, and cannot be summed.

[21] For example, if a visitor buys $50 in clothing at a local store, the store receives the retail margin (assume $25), the wholesaler or shipper may receive $5 dollars, and the remaining producer price of the clothing ($20) leaks immediately outside the local economy, unless the clothing is manufactured in the local region. Also, note that leakage may be greater than 10 percent for retail goods, while for lodging spending, leakage may be less.

The sales multiplier for the region is 1.47, meaning that an additional $0.47 sales is generated through secondary effects for every dollar of direct sales. Secondary effects measure changes in economic activity in the region that results from the re-circulation of the money spent by visitors. For example, linen suppliers benefit from visitor spending at lodging establishments. In addition, linen supply employees live in the region and spend the income earned on housing, groceries, clothing, and other goods and services. In the case of VINP visitor spending, secondary effects generate an additional 520 jobs, approximately $39 million in sales, $14 million in personal income and $25 million in value added.

Table 7
Economic Impacts of Visitor Spending

	Direct Sales (1) ($000s)	**Jobs(2)**	**Personal Income(3) ($000s)**	**Value Added(4) ($000s)**
Motel, hotel, or B&B	$34,731	710	$11,328	$17,215
Camping Fees	$3,887	79	$1,268	$1,927
Restaurants and Bars	$18,383	494	$6,261	$8,721
Groceries and Take-out	$2,589	12	$300	$590
Gas and Oil	$104	0	$4	$11
Local Transportation	$11,919	260	$5,981	$7,400
Admissions and Recreation(5)	$4,158	115	$1,439	$2,354
Clothing	$134	2	$29	$34
Souvenirs and Other Expenses	$159	1	$33	$57
Retail Trade	$7,170	184	$3,658	$5,713
Wholesale Trade	$1,269	13	$512	$873
Total Direct Effects	$84,503	1,873	$30,812	$44,895
Secondary Effects	$39,304	520	$14,267	$24,520
Total Effects	$123,807	2,393	$45,079	$69,415
Multiplier(6)	1.47	1.28	1.46	1.55

Notes:

(1) Direct sales are the receipts to firms within the region from tourist spending. Not all tourist spending on goods will appear as direct sales to the region. The retail margins on goods bought by tourists appear in the Retail Trade sector; the producer price of these goods appears in the corresponding production sector, although only locally made goods are attributed to the region's economy.

(2) Job estimates are not full time equivalents as they include part time jobs. However, a four-month seasonal position is counted as a third of a job (4/12).

(3) Personal income includes wage and salary income and proprietor's income.

(4) Value added is the most commonly used measure of the contribution of an industry to gross state product. Value added is personal income + profits and rents + indirect business taxes. Equivalently, value added is total sales - the costs of all non-labor inputs.

(5) Admissions do not include entrance fees paid to the park as these are included in a separate analysis of park operations (See Appendix C).

(6) Multiplier is the ratio of total effects to direct effects. (1-multiplier) is the amount of secondary impact generated per unit of direct impact. For example, if the sales multiplier is 1.6, $ .60 in secondary sales are generated for every dollar of direct sales.

VI. STUDY LIMITATIONS

Various sources of uncertainty affect the estimates of economic impacts of VINP visitor spending. The accuracy of the MGM2 model is dependent on the inputs to the model, including visitor counts, visitor spending averages and multipliers. Depending on the direction and magnitude of errors in visits, spending, and multipliers, these errors may compound or cancel each other. In addition, there are some limitations associated with the model itself.

Limitations associated with inputs to the MGM2 model include:

- Estimates of the number of visitors based on monthly visitor counts by VINP may represent an over- or under-estimate of park visitors; the direction of this bias is unknown. For example, the methodology used to develop recreation visit figures estimates the number of visitors to unguarded beaches in the park as 20 percent of visitors to Trunk Bay.[22] Additional primary research would be necessary to validate this methodology.

- Allocation of recreation visits to lodging segments is based on available information and professional judgment. While information is available to accurately allocate visits to campgrounds and boats, the allocation of remaining visits to hotels, villas/condos and day visits is more uncertain. Data on cruise ship visitors on tours to the park and Incidental Business Permit holders were used to validate estimates of day visitors. Counts of all visitors to the park, and information about lodging types used by visitors to the park are not readily available; thus the accuracy of these assumptions is unknown. The number of visitors and distribution among visitor segments likely represent the largest source of error in the MGM2 model results. For example, if the day visitors segment is underestimated and thus the hotel segment is overestimated, our results could be overstated, as hotel users spend nearly $500 more per night on average. Sensitivity analysis indicates that if the share of day visitor party nights was increased by 10 percent of total, and hotel and villa/condo segment shares of party nights were each decreased by 5 percent of total party nights, total spending would decrease from $91.9 million to $83.3 million.

- Errors in party sizes, reentry rates or length of stay will affect impact estimates, which are based on the number of party nights. These parameters have been calculated based on the VINP 2004 Visitor Spending Survey. Potential sources of bias for these parameters include non-response, sampling procedures (selection bias), and misinterpretation of survey questions.

- Spending averages are subject to sampling errors, seasonal bias, and measurement errors.

    - The sampling errors on per night average spending vary from 9 percent to 16 percent, depending on the lodging segment, and are 6 percent overall. Sampling

[22] See "Virgin Islands National Park, Public Use Counting and Reporting Instructions," dated January 1, 2003, accessed at http://www2.nature.nps.gov/stats/pdf/viisci2003.pdf.

errors are based on the number of cases sampled and the variation in the sample results.

- The VINP 2004 Visitor Spending Survey was conducted during the peak season (in March 2004); therefore, spending has been adjusted to reflect a seasonal bias.

- Only visitor spending on St. John (including transportation to and from St. John) is included in average visitor spending estimates. Limiting the region to St. John may slightly underestimate impacts, as visitors to the Park may also visit other islands in the area during their stay. However, the majority of economic impact related to park visitors relates to spending on St. John.

- The analysis assumes all spending by visitors to the park is attributable to the park, which may overstate results. This assumption is based on the fact that 80 percent of visitors indicated that their primary reason for visiting the area was "to visit the park," as reported in the VINP 2004 Visitor Spending Survey. Local day visitors have been included in this analysis because information was not available to separately analyze this segment. While this may somewhat overstate impacts attributable to the park, the number of non-local day visitors to the park may be somewhat understated in visitor counts, canceling out this bias.[23]

- Multipliers used are based on the MGM2 generic data set for small metro areas in the MGM2 model, with jobs multipliers reduced by 10 percent (shown in Appendix B). The generic multipliers in the MGM2 model are based on data from IMPLAN for small metro areas throughout the U.S. The direction of any uncertainty associated with these multipliers is unknown, as developing specific multipliers for the study region was beyond the scope of this study. Based on a review of employment data for the region, jobs multipliers were reduced 10 percent. Sensitivity analysis indicates that depending on the choice of generic multipliers, estimates of total effects range from $108.6 million to $142.9 million in total sales (based on rural and state multipliers, respectively) versus $123.8 million using the small metro multipliers. Thus, effects on local sales may be overestimated by as much as 12 percent or underestimated by 15 percent. Estimates of total jobs attributable to park visitors spending ranges from 2,541 to 2,092 (based on rural and state multipliers, respectively) versus 2,393 jobs estimated using the small metro multipliers.

In addition, it is important to note that the MGM2 model does not address all of the potential impacts that the park may have on the region. In particular:

- Local economic impacts associated with park operations and construction activity are not included in this analysis. As detailed in Appendix C, these impacts are estimated separately using a companion spreadsheet model, MGM2Operate.xls.[24] Revenues to

[23] For example, recreational visitor counts do not include visitors to Annaberg. See "Virgin Islands National Park, Public Use Counting and Reporting Instructions," dated January 1, 2003, accessed at http://www2.nature.nps.gov/stats/pdf/viisci2003.pdf.
[24]MGMOperate model is available for download at http://prr.msu.edu/mgm2/mgm2main.htm.

the park from mooring fees and admissions fees have not been included in this analysis, in order to avoid double counting.

- This analysis does not address benefits of park experiences to visitors or other non-market transactions. For example, potential costs and benefits associated with non-market transactions such as educational and environmental benefits, or costs/benefits of congestion, traffic, road repairs, utilities and other public services are not captured in this model.

- Impacts on surrounding property values are not included in this economic impact assessment. The published economics literature has documented that real social welfare benefits such as increased property values can result from preservation of open space, such as the national park on St. John.[25] Likewise, regional economies and communities can benefit from the preservation of open space and biodiversity. However, these benefits are not addressed in the MGM2 model, which focuses on the impacts associated with visitor spending.

  The existence of the VINP may have an impact on property values on St. John. The park constrains the amount of privately available property on St. John, and may also affect demand for property on St. John, which in turn increases price. However, many factors influence property values; therefore, to determine property value impacts would require additional research beyond the scope of this report.

VII. SUMMARY AND DISCUSSION

This report documents the regional economic significance of the approximately 822,000 visitors to VINP in 2003. This analysis estimates that visitors to VINP spent $91.9 million on St. John in 2003. With secondary effects, created by the re-circulation of money spent by visitors, this direct visitor spending resulted in total economic impacts of $123.8 in local sales, $45.1 million in personal income, $69.4 million in value added and 2,393 jobs. The economic sectors receiving the greatest benefit from park visitors were lodging ($34.7 million in direct sales) and restaurants and bars ($18.4 million in direct sales).

To put these figures in context, total visitor expenditures for the U.S. Virgin Islands (including St. Croix, St. John and St. Thomas) in 2003 were $1,270.5 million. Thus, VINP visitors account for approximately 7% of direct visitor spending in the U.S. Virgin Islands overall. In addition, jobs related to VINP visitor spending account for approximately 20% of the total tourism-related employment in the U.S. Virgin Islands of 8,910 in 2002.[26] Data are not available to allow for comparison with the specific region represented in this study (St. John).

[25] In particular see: Economic Impacts of Protecting Rivers, Trails and Greenway Corridors, National Park Service, 1990. Available for download from http://americantrails.org/resources/economics/GreenwaySumEcon.html.
[26] U.S.V.I. Bureau of Economic Research, U.S. Virgin Islands Annual Tourism Indicators, accessed at http://usviber.org/TOUR03.pdf.

In addition to impacts from visitor spending, regional economic impacts from park payroll, operations, and construction expenditures were estimated using the MGM2Operate model (see Appendix C). In FY 2004, VINP had 73 annual employees and 5 seasonal employees (annual equivalent). The park payroll was approximately $4.1 million, including $3.2 million in wages and salaries and $0.9 million in benefits. Locally, VINP spent approximately $600,000 on operating expenses (other than payroll expenses) and $350,000 on construction in FY 2004. Based on these expenditures, VINP park operations and construction result in total economic impacts of $3.8 million in sales, 138 jobs, $5.4 million in personal income and $6.4 million in value added. This represents jobs and economic output that would likely not exist without the park.

Combining the total impacts of visitor spending and park operations and construction, VINP supports approximately 2,500 jobs in the region and personal income of $50.5 million annually, based on 2003-2004 data.[27] Alternatively, VINP economic impacts can be measured as contribution to sales of $127.6 million, or value added of $75.8 million.

The overall MGM2 and MGM2Operate economic impact estimates provide a quantitative picture of the role the park plays in the region's economy. An understanding of the park's economic significance is helpful in garnering support among local partners to help preserve the park and also to better serve both the visitor and the local community. Other uses of the model results include evaluation of management, marketing and development plans. Table 8 provides information on the marginal economic impacts of VINP visitor spending estimated by the MGM2 model, by lodging segment.

Table 8
Marginal Economic Impacts of Visitor Spending
Per Additional 1,000 Party Nights
by Lodging Segment

	Direct Sales ($000s)	Direct Jobs	Direct Personal Income ($000s)	Direct Value Added ($000s)
Hotel	$630	14	$211	$312
Villa/Condo	$533	11	$180	$264
Campground	$303	7	$104	$151
Boat	$217	3	$62	$93
Day Visitor	$139	3	$53	$72

The MGM2 model can be used to evaluate a particular management decision, such as whether to expand an existing facility. To utilize the results for this purpose, first compute the change in party nights that would be expected – for example, adding 10 units occupied for 100 nights yields 1,000 additional party nights. Based on the marginal economic impacts calculated by the MGM2 model, for a campground facility, adding 1,000 party nights would result in an increase of $303,000 in direct sales, seven jobs, $104,000 in personal income and $151,000 in value added. Similarly, the model results can be used to understand the impact of a decision that could decrease party nights. Impacts of different alternatives can also be compared, such as a marketing campaign to increase day trips versus expanding campground facilities.

[27] Visitor spending impacts are based on calendar year 2003 data, while park operations and construction impacts are based on FY 2004 data. Because FY 2004 data overlaps 2003-2004, results have not been adjusted.

Suggested research to further refine the visitor spending economic impact estimates presented in this report includes:

- Efforts to confirm and improve the methodology used to develop monthly public use statistics;

- A survey of off-season park visitors to understand off-season spending patterns; and,

- Additional comparisons of park visitor characteristics with other secondary sources of tourism activity for St. John specifically, if this information can be obtained from local government agencies.

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APPENDIX A

SPENDING SURVEY REPORT

VIRGIN ISLANDS NATIONAL PARK VISITOR SPENDING SURVEY
SUMMARY REPORT

Prepared by
Jane Israel

Prepared for
The Friends of the Virgin Islands National Park

Revised June 2004

ACKNOWLEDGEMENTS

Thanks to all of the volunteers with the Friends of the Virgin Islands National Park who took on the role of interviewers and made this survey possible. A special thanks to Emily Burton for coordinating the survey effort for the Friends.

INTRODUCTION

This report describes the results of a survey of visitors to the Virgin Islands National Park (VINP). This survey was conducted as a part of a larger effort to prepare a regional economic impact analysis of the park. The purpose of this survey was to gather data on visitor spending patterns. This data will be used to estimate the regional economic impact of visitors to the VINP. It should be noted that the results presented here have not been weighted to represent the population of visitors to VINP as a whole, but rather, are presented by lodging type. This is because this survey was performed in order to collect data needed to run the Money Generation Model – Version 2 (MGM2), a regional economic impact model designed for the National Park Service.[1]

This summary report consists of three sections. First, the survey methodology is discussed. Next, the results of the survey are presented. The final section summarizes the limitations of the survey.

METHODOLOGY

The survey was conducted from March 21 through March 28, 2004. Face to face interviews were conducted by a team of volunteers from the Friends of the Virgin Islands National Park. A total of 260 surveys were completed. The questionnaire design was based on questions suggested by the developers of the Money Generation Model – Version 2 (MGM2), in order to collect data needed to run this regional economic impact model.[2] These suggested questions were then modified to be more specific to the VINP. The survey was reviewed and approved as a data collection instrument for the National Park Service by the Office of Management and Budget. A copy of the survey instrument is provided in Appendix A.

Sample size was determined based on estimates of the numbers of VINP visitors annually. Survey locations were chosen based on discussion with Virgin Islands National Park Service personnel and locations used for a previous visitor survey.[3] Visitors were sampled at various locations as shown in Table 1.

Visitors were greeted and asked to participate in the study. If they agreed, the interview lasted approximately 10 minutes. Completed questionnaires were coded and the information was entered into a computer and analyzed.

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[1] The MGM2 Model is a set of Microsoft Excel workbooks for estimating the economic impacts of National Park Service visitor spending on a local region. MGM2 was developed by Daniel Stynes and Dennis Propst at Michigan State University. The suggested spending questions for visitor survey projects can be found at http://prr.msu.edu/mgm2/mgm2main.htm.

[2] The MGM2 Model is a set of Microsoft Excel workbooks for estimating the economic impacts of National Park Service visitor spending on a local region. MGM2 was developed by Daniel Stynes and Dennis Propst at Michigan State University. The suggested spending questions for visitor survey projects can be found at http://prr.msu.edu/mgm2/mgm2main.htm.

[3] Littlejohn, Margaret. Virgin Islands National Park Visitor Survey, Spring 1997. Visitor Services Project Report 93. November 1997.

Table 1 Questionnaire Distribution Locations		
Location	**Number of Questionnaires Completed**	**% of Questionnaires Completed**
Trunk Bay	45	17%
Annaberg Sugar Mill	38	15%
Boats Anchored in Park Bays	38	15%
Cruz Bay Visitor Center	37	14%
Hawksnest Bay	32	12%
Cinnamon Bay	22	8%
Maho Bay	22	8%
Salt Pond Bay	15	6%
Francis Bay	11	4%

RESULTS

The study collected information on visitor parties. A total of 288 parties were contacted. Of these, 260 completed surveys, for a 90 percent response rate. Occasionally, a question may have been unanswered, creating missing data. In addition, some questions may have been answered incorrectly, due to carelessness, or misunderstanding directions, creating reporting errors. For example, in cases where a day user reported lodging expenses, these were excluded. The number of responding parties is reported below for each question. The remainder of this section summarizes the results of the survey.

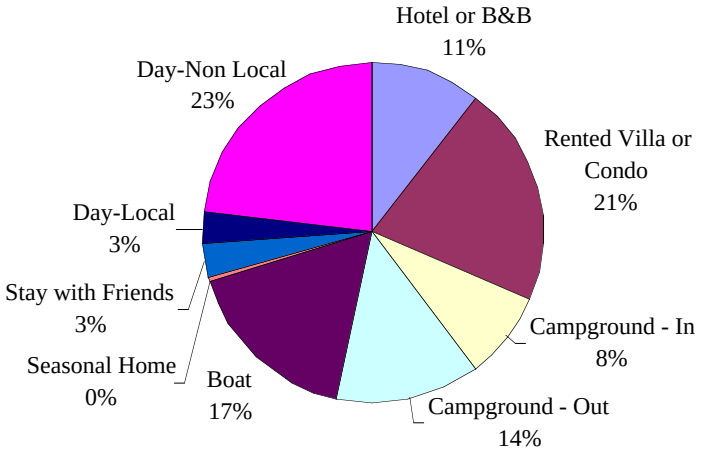
Lodging Type

Of the 260 parties that completed interviews, approximately 74% were overnight visitors, and 26% were day visitors. The majority of overnight visitors interviewed were staying in a rented villa or condo. The distribution of lodging types is shown in Table 2.

Table 2 Lodging Type		
Lodging Type	**# of Parties[1]**	**% of Parties Sampled**
Hotel	28	11%
Villa/Condo	55	21%
Campground – Inside the Park	22	8%
Campground – Outside the Park	36	14%
Boat	45	17%
Owned Seasonal Home	1	0.4%
Friends or Relatives	9	3%
Day – Local	8	3%
Day – Non-Local	61	23%
Total	265	100%

Notes:
(1) Because parties that were using more than one lodging type are counted as a separate party for each lodging type, the total number of visitor parties is greater than the total number of completed surveys.

Figure 1. Lodging Type as Percent of Total Sampl



As evidenced in Table 2 and Figure 1, several lodging types were not well represented in the sample. In particular, seasonal home-owners, parties visiting friends or relatives, and local day users each had less than 10 parties sampled. In order to interpret these results, the analysis re-classifies segments that have less than 25 respondents. For analytical purposes, segments have been combined as follows:

- Hotel: Includes only hotel lodging type;

- Villa/Condo: Includes villa/condo, seasonal home-owner, and staying with friends or relative lodging types;
- Campground: Includes both campgrounds inside and outside the park;
- Boat: Includes only boat lodging type; and
- Day User: Includes both local and non-local day users.

Results are presented below for an average party for each lodging type.

Length of Stay

Average length of stay broken down by lodging type is shown in Table 3. As demonstrated below, the length of stay varied greatly for those staying in a villa/condo or on a boat.

Table 3
Length of Stay

Lodging Type	Number of Respondents	Average Length of Stay	Min Length of Stay	Max Length of Stay
Hotel	28	6	3	10
Villa/Condo	61	15	2	365
Campground	57	7	2	16
Boat	45	4	1	50

Previous Visits to VINP

Visitors were asked the following question: *Have you visited this Park before this trip? (IF YES) How many times before have you visited this park?* Based on the responding samples, an average of 26 to 62 percent of parties had previously visited the park, depending on lodging type. The average number of previous visits broken down by lodging type is shown in Table 4.

Table 4
Previous Visits to VINP

Lodging Type	Number of Respondents	Number of Parties that had Previously Visited VINP	Percent of Parties that had Previously Visited VINP	Average Number of Previous Visits
Hotel	28	10	36%	1
Villa/Condo	65	40	62%	8
Campground	58	28	48%	8
Boat	32	21	47%	8
Day User	67	18	26%	15

Park Re-Entry

Visitors were asked the following question: *Including this entrance, how many times have you or will you enter the park during your stay in the area?* For this question, if needed, visitors were shown a map of VINP to assist their visualization of park boundaries. Park re-entry broken down by lodging type is shown in Table 5. Depending on lodging type, visitors parties enter the park on average from one to 11 times during their visit.

Table 5
Park Re-entry

Lodging Type	Number of Respondents	Number of Re-entries
Hotel	28	4.8
Villa/Condo	63	11.1
Campground	58	6.6
Boat	44	2.2
Day User	69	1.4

Party Size

Average visitor party size for varied from two to four persons, depending on lodging type. Party size is broken down by lodging type in Table 6.

Table 6
Party Size

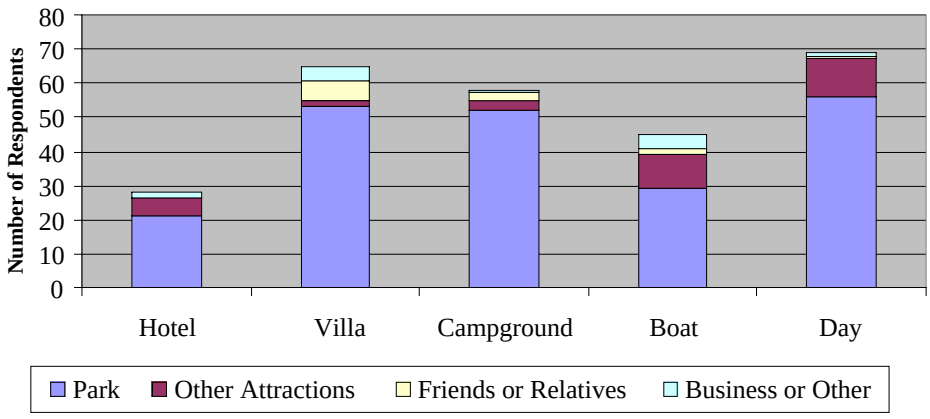
Lodging Type	Number of Respondents	Average Total Party Size
Hotel	28	3.1
Villa/Condo	65	3.9
Campground	58	3.7
Boat	45	3.4
Day User	69	2.9

Primary Reason for Trip

Visitors were asked to choose their primary reason for visiting the area from four choices. The majority of visitor parties in each lodging type chose the answer “To visit this park.” The frequency of each answer is demonstrated by lodging type in Table 7.

Table 7 Primary Reason for Visiting the Area					
		Number of Parties Choosing Each Answer			
Lodging Type	**Number of Respondents**	**To visit this park**	**To visit other attractions in the area**	**Visiting friends or relatives in the area**	**Business or other reasons**
Hotel	28	21	5	--	2
Villa/Condo	65	53	2	6	4
Campground	58	52	3	2	1
Boat	45	29	10	2	4
Day User	69	56	11	1	1

Figure 2. Frequency of Reason for Visiting



Spending Patterns

Visitors were asked to detail their spending during their entire trip for their entire party. Table 8 presents the results of the spending questions broken out by lodging type on a per party night basis (one night is assumed to equal one day for day visitors). Note that this average does not account for party size. Thus, average spending per night may seem high for day users whose spending represents their entire stay (one day). However, it is important to note that overnight visitors length of stay ranged from four to 15 nights on average, depending on lodging type (see Table 3).

Lodging Expenses

Visitor parties staying at a hotel spent $422 per night on average, villa/condo users spent an average of $304 per night, and parties staying at campgrounds spent $139 per night on average. Boaters spent $14 per night for mooring fees on average.

Food and Beverages

The average spending for restaurants per party night ranged from $40 for day use visitors to $123 for hotel visitor parties. For groceries, visitor party spending per night on average ranged from $3 for day use visitor parties to $51 for boat visitor parties.

Transportation

For local transportation, average spending per party night ranged from $8 for boat visitors to $53 for villa/condo visitor parties. Average spending for gas and oil varied from $2 to $13 depending on lodging type, with boat visitors spending the most at an average of $13 per night. Boat visitors also spent the most on average for other transportation, because this category included the cost of renting a charter boat, where applicable. Average spending for other transportation per night ranged from zero for hotel and campground visitor parties to $45 for boat visitor parties.

Recreation and Entertainment

Spending for admissions and entertainment fees (excluding park admission fees) averaged from $2 to $27 per night depending on lodging segment. Average spending for jewelry per party night varied from $9 to $24 depending on lodging segment. For clothing, average spending per party night ranged from $10 for campground visitor parties to $19 for boat visitor parties. For other goods, spending averages per night ranged from $7 for campground and boat visitor parties, to $12 for day user visitor parties. Other services spending per night ranged from $1 on average for day use and boat visitor parties, to $5 on average for hotel visitor parties.

Table 8 Average Spending per Party per Night					
	Lodging Type				
Spending Category	**Hotel**	**Villa/ Condo**	**Campground**	**Boat**	**Day User**
Lodging					
Hotel, etc.	$422	$304			
Camping fees			$139		
Mooring fees				$14	
Food and Beverages					
Restaurants and Bars	$123	$84	$68	$56	$40
Groceries and Take-out	$15	$36	$16	$51	$3
Transportation					
Local Transportation	$33	$53	$35	$8	$43
Gas and Oil	$3	$4	$2	$13	$2
Other Transportation	$-	$1	$-	$45	$2
Recreation & Entertainment					
Admissions & Recreation fees	$25	$27	$25	$2	$11
Jewelry	$9	$20	$9	$24	$14
Clothing Purchases	$12	$15	$10	$19	$17
Other Goods	$8	$8	$7	$7	$12
Other Services	$5	$3	$4	$1	$1
Total Spending (without airfares)	$641	$557	$315	$239	$144

In order to better understand these averages, Table 9 presents 95th percent confidence intervals for each of the total spending averages. For example, while the reported average per party night spending for hotel visitor parties is $641, we are 95 percent confident that the true mean lies between $500 and $782.

Table 9 Confidence Intervals for Average Total Spending			
Lodging Type	**Number of Respondents**	**Average Total Spending per Party Night**	**95% Confidence Interval**
Hotel	28	$641	+/- $141
Villa/Condo	58	$557	+/- $105
Campground	54	$315	+/- $43
Boat	45	$239	+/- $76
Day User	67	$144	+/- $32

LIMITATIONS

Limitations of this survey should be considered when interpreting the results. The following uncertainty factors should be taken into account when reviewing the results:

- Visitor responses may not reflect actual behavior. For example, visitors may have been interviewed at the start of their trip, and thus had to guess at what expenses they would incur. This is a disadvantage of all such studies.

- Missing data due to unanswered questions causes the number in the responding sample to be less than the total sample. In addition, questions answered incorrectly, either due to carelessness or misunderstanding directions, are considered reporting errors and create small data inconsistencies. Efforts undertaken to minimize reporting errors included training interviewers and designing a brief survey instrument.

- Outliers have been excluded for the purposes of this analysis. Visitor parties with party size of 10 or greater were considered outliers. In addition, several other outliers were excluded including a reported expenditure of $18,000 for jewelry, and reported number of visits to the park of 10,000 or greater (reported for some local day-users).

- Data collected represents spending and use patterns of visitors during March 21 through 28, 2004. These results do not necessarily apply to visitors during other times of the year; thus care should be taken in annualizing these results. In particular, these results represent visitors in peak season, and as such, some reported spending may be higher than during off-season. In particular, lodging rates generally change to shoulder or summer rates in April or May. Based on a comparison of winter versus summer rates, lodging rates on St. John are typically 50% higher during the winter season.[4] This should be taken into consideration when annualizing the results.

- For boat users, the majority of boaters were interviewed at moorings in Caneel Bay, which may have lead to an upward bias in spending since this bay is close to Cruz Bay.

- For several segments, sample size is small. Specifically, seasonal home-owners, parties visiting friends or relatives, and local day user segments each had less than 10 parties sampled. For those segments, results could not be generalized to the population of visitors in that segment, thus segments were more broadly defined to incorporate these respondents.

[4] Based on phone calls to gather rate information from Maho Bay/Concordia, Cinnamon Bay, Caneel Bay Resort, The Westin Resort, Gallows Point, Catered To, and a review of the rate sheet provided by the St. Thomas-St. John Hotel Association. Gallows Point and the Westin winter rates were actually closer to double their summer rates. This also does not account for higher holiday rates (e.g., Thanksgiving and Christmas) where applicable.

APPENDIX A to Spending Survey Report

Virgin Islands National Park Spending Survey
March 21 – 28, 2004

Virgin Islands National Park Visitor Spending Survey

Date_____
Interviewer _____
Location _____
Time of day_____

Hello, my name is _____. I am a volunteer with the Friends of the Virgin Islands National Park. We are conducting a survey of visitors to the Park in order to better understand the economic impact of the Park on the region. The Paperwork Reduction Act requires approval of all federal government surveys by the Office of Management and Budget. This survey has been approved under this Act. Additional information about this survey and its approval is available at your request.* The questions I would like to ask will only take about ten minutes to complete. All of your answers are voluntary and confidential. Your participation is greatly appreciated. Would you be willing to participate in our survey?

(If Yes, continue to Q1, If No, say "Thanks for your time and enjoy your visit to the Park." Then record the following based on observation: # of Adults_____ # of Children_____)

Q1. **I would like to begin by asking you a few questions about your visit to the park. Which one of the following four choices best describes your primary reason for making the trip to this area?**

To visit this park.....

To visit other attractions in the area.....

To visit friends or relatives in the area .....

To conduct business or other reasons .....

Q2. On this trip, are you staying overnight, away from home, on St. John?

1. NO
2. YES

Q2a. **How many nights are you staying on St. John?** _____

Q2b**. What type of lodging are you using?** (Interviewer: Check all that apply; If more than one, specify how many nights in each)

Hotel or B&B ....._

Rented Villa or Condo ....._

Campground – Inside the Park....._

Campground – Outside the Park ....._

Boat....._

Owned Seasonal Home ....._

Staying with friends or relatives ....._

Other (Please Describe) .....

Q3. **Have you visited this Park before this trip?** 1. NO 2. YES

(If YES) **How many times before have you visited this park?** _____

Q4. **What is the zip code of your primary residence?** (If non-US, enter country name)

_____

Q5. **Including this entrance, how many times have you or will you enter the park during your stay in the area?** _____

Q6a. **How many Adults (18 and older) are in your travel party?** _____

Q6b. **How many children are in your travel party?** _____

Q7. **Next, I would like to ask you about your spending on this trip. Thinking about your spending on St. John, please estimate spending for your travel party during your stay here in each of the following categories. (**Interviewer: provide page showing the categories.**) Please include all spending for goods and services during your stay in the local area including pre-paid hotel deposits, and all other payments whether by cash, credit card, or check. If you do not know the exact amount it is ok to make your best guess.**

First I will cover Lodging expenses. How much will you spend on….

Q7a. **Hotels, a rental villa or condo, cabins, ...** $_____

Q7b. **Camping fees and charges** $_____

Q7c. **Mooring fees** $_____

Next, I would like to ask about spending for Food and Beverages. How much will you spend on…

Q7d. **Restaurants and bars** $_____

Q7e. **Groceries and take out food** $_____

The next category is Transportation. How much will you spend on…

Q7f. **Airfares** $_____

Q7g. **Taxis, Ferries, Shuttles, and Car Rental** $_____

Q7h. **Gas and oil (for an auto or boat)** $_____

Q7i. **Any other transportation expenses** $_____

The last category I would like to cover is Recreation & Other Expenses. How much will you spend on:

Q7j. **Admissions and recreation fees (Exclude park entrance fees, but include sailing or diving excursions, kayak/snorkel rental)** $_____

Q7k. **Jewelry purchases** $_____

Q7l. **Clothing purchases** $_____

Q7m. **Other goods (for example, souvenirs, film, books)** $_____

Q7n. **Other services (for example, massage, hair cut)** $_____

That is the end of the survey. Thanks for your time and enjoy your visit to the Park!

***Additional Information to be Provided upon Request.**

OMB Approval number:	#1024-0224
Expiration Date:	10/31/2004
Person Collecting and Analyzing Information:	Jane Israel P.O. Box 339 St. John, VI 00831 (340)777-6831

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. No personal data will be recorded. The data collected through surveys may be disclosed to the Department of Justice when relevant to litigation or anticipated litigation, or to appropriate Federal, State, local, or foreign agencies responsible for investigating or prosecuting a violation of the law.

You may direct comments on the number of minutes required to respond, or on any other aspect of this survey to:

Information Collection Clearance Officer,
WASO Administrative Program Center
National Park Service
1849 C Street, NW
Washington, D.C. 20240

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APPENDIX B

MULTIPLIERS

MGM2 Generic Multipliers for Small Metro Area with Jobs Multipliers Reduced 10%

	Direct effects	Total effects multipliers							
Sector	Jobs/ MM sales	Personal inc/sales	Property Inc/sales	Value Added /sales	Sales II	JobsII/ MMsales	IncII/ sales	VA II/sales	Sales I
Hotels And Lodging Places	22.12	0.33	0.11	0.50	1.52	29.73	0.52	0.83	1.32
Eating & Drinking	29.05	0.34	0.07	0.47	1.44	34.92	0.49	0.74	1.24
Amusement And Recreation	30.00	0.35	0.18	0.57	1.45	36.55	0.51	0.85	1.25
Auto repair and service	11.48	0.31	0.14	0.48	1.41	16.98	0.45	0.72	1.23
Local transportation	27.66	0.57	0.09	0.67	1.43	33.93	0.73	0.94	1.15
Food processing	5.04	0.12	0.11	0.23	1.33	10.09	0.25	0.45	1.23
Apparel from purch mate	12.93	0.21	0.04	0.25	1.36	17.73	0.34	0.46	1.22
Petroleum refining	0.46	0.04	0.05	0.11	1.05	2.49	0.10	0.24	1.01
Sporting goods	11.31	0.21	0.15	0.39	1.42	16.63	0.36	0.64	1.27
Manufacturing	9.38	0.21	0.14	0.36	1.33	14.25	0.35	0.58	1.19
Retail Trade	27.80	0.51	0.13	0.80	1.38	33.30	0.65	1.04	1.13
Wholesale trade	11.47	0.40	0.13	0.69	1.38	17.04	0.55	0.92	1.17

APPENDIX C

Economic Impacts of Park Operating and Construction Expenses

The purpose of this Appendix is to provide an estimate of the regional economic impact resulting from the Virgin Islands National Park (VINP) operations and construction in fiscal year 2004 (FY 2004). Based on actual spending for VINP for FY 2004 (year ending September 30, 2004), regional economic impact was estimated using the MGM2operate model, a spreadsheet model designed for the National Park Service.[1] For purposes of this analysis, the local region was defined as St. John and St. Thomas.[2] Multipliers were based on generic profiles for a small metro area provided in the MGM2operate model. Economic impacts were measured as direct and secondary sales, income, and jobs in the local area that result from VINP payroll, operating expenses, and construction expenditures.

Table C-1 illustrates VINP payroll, operating and construction expenses for FY 2004. Salaries and wages represent approximately 65 percent of the total payroll plus operating expenses for VINP. Including benefits, payroll expenses make up 83 percent of total payroll and operating expenses. Construction expenses in FY 2004 were estimated to be $350,000.

Table C-1
VINP Payroll, Operating, and Construction Expenses - FY 2004

	Spending by Park	Percent to Local Firms	Local Purchases
Payroll Expenses			
Wages & Salaries	$3,196,709	100%	$3,196,709
Benefits	$856,084	100%	$856,084
Total Payroll Expenses	$4,052,793		$4,052,793
Jobs (annual, full & part time)	73		
Jobs – seasonal (annual equivalent)	5		
Operating Expenses			
Utilities			
Electric	$133,516	100%	$133,516
Gas	-	100%	-
Telephone	$72,688	100%	$72,688
Water/sewer	$1,500	100%	$1,500
Postal Service	$6,500	5%	$325
Services	$417,967	50%	$208,984
Auto rental/lease	$1,854	0%	-
Supplies	$80,000	50%	$40,000
Gas and Oil	$142,581	100%	$142,581
Total Operating Expenses	$856,606		$599,594
Total Payroll plus Operating Expenses	$4,909,399		$4,652,387
Construction Expenses			
Repairs	$350,000	100%	$350,000
Total Construction Expenses	$350,000		$350,000

Source: FY 2004 payroll and operating expenses (actuals estimated through the end of FY 2004) and estimated construction expenses provided by Janice Williams, Virgin Islands National Park, August 26, 2004.

[1] The MGM2operate Model is a set of Microsoft Excel workbooks for estimating the economic impacts of National Park Service operations and construction on a local region. The MGM2operate model was developed by Daniel Stynes and Dennis Propst at Michigan State University. The model and associated information are available on the Internet at: http://prr.msu.edu/mgm2/mgm2main.htm.

[2] The region was defined to include St. Thomas as well as St. John to capture the economic impacts of spending by park employees who live on St. Thomas, as well as local companies (e.g. utilities) based on St. Thomas.

Regional economic impact models (like the MGM2operate model employed in this analysis) translate initial changes in expenditures into changes in demand for inputs to affected industries. These effects can be described as direct, indirect, or induced, depending on the nature of the change.

- *Direct effects* represent changes in output attributable to a change in demand or a supply shock, specified initially by the modeler. In this case, the initial effects consist of the economic output attributable to VINP operations and construction.
- *Secondary effects* include both indirect and induced effects.
    - *Indirect effects* are changes in output of industries that supply goods and services to those that are directly affected by the initial change in expenditures; and,
    - *Induced effects* reflect changes in household consumption, arising from changes in employment (which in turn are the result of direct and indirect effects). For example, changes in employment in a region may affect the consumption of certain goods and services.

Economic impacts resulting from park payroll, operating, and construction expenses are detailed in Table C-2.

VINP had 73 annual employees and 5 seasonal employees (annual equivalent) in FY 2004. The park payroll was approximately $4.1 million, including $3.2 million in wages and salaries and $0.9 million in benefits. Secondary effects arise primarily from the induced effects of VINP employees spending their income in the local region. The induced effects of VINP payroll expenses supports an additional 44 jobs paying a total of $941,000 in personal income and contributing approximately $1.6 million in value added.

Total impacts are the sum of all direct and secondary effects. Secondary effects capture represent the total changes in economic activity in the region that result from the re-circulation of the VINP payroll and local purchases of goods and services through the local economy. VINP park operations and construction result in total economic impacts of $3.8 million in sales, 138 jobs, $5.4 million in personal income and $6.4 million in value added. This represents jobs and economic output that would likely not exist without the park. However, it is important to note that the model is static in nature and measures only those effects resulting from specific changes in economic output (e.g., economic output attributable to VINP operations and construction) at a single point in time. Thus, the model does not account for adjustments that may occur, such as the subsequent re-employment of workers displaced if the VINP were no longer in existence. In the present analysis, this caveat suggests that the long-run net output and employment effects are likely to be smaller than those estimated in the model.

Table C-2
Economic Impacts of Park Operations and Construction

	Direct Impacts		Total Impacts [1]			
Spending Category	**Park Spending**	**Local Sales**	**Total Sales[2]**	**Total Jobs**	**Total Personal Income[3]**	**Total Value Added[4]**
A. Impacts of Park Payroll						
Wages and Salaries	$3,196,709				$3,196,709	$3,196,709
Benefits	$856,084				$856,084	$856,084
NPS Jobs (annual, full & part time)				73.0		
NPS Jobs - seasonal (annual equivalent)				5.0		
Induced effects of NPS payroll			$2,683,957	43.5	$941,177	$1,595,829
Total Payroll Effects	$4,052,793		$2,683,957	121.5	$4,993,970	$5,648,622
B. Impacts of Park Operations						
Utilities + postal	$214,204	$208,029	$253,811	1.4	$62,756	$193,865
Services	$417,967	$208,984	$311,476	5.3	$116,316	$164,380
Supplies	$222,581	$48,516	$67,140	1.8	$31,385	$50,272
Total Operating Expenses	$854,752	$465,529	$632,427	8.0	$210,457	$408,517
Total Impacts of Park Operations (Salaries + Operating)	$4,907,545	$465,529	$3,316,384	129.9	$5,204,427	$6,057,139
C. Construction Impacts	$350,000	$350,000	$511,943	8.3	$244,680	$294,091
D. Total Impacts (Payroll, Operating, and Construction)			$3,828,327	138.3	$5,449,107	$6,351,230

Notes:

(1) Sales, personal income, and value added are independent measures of economic impact, and should not be added together.

(2) Total sales are the direct receipts to firms within the region from park operations as well as secondary impacts related to spending by employees of the park and other businesses that sell goods and services to the park. Only the retail margins on goods are attributed to the region's economy.

(3) Personal income includes wage and salary income and proprietor's income.

(4) Value added is the most commonly used measure of the contribution of an industry to gross state product. Value added is personal income + profits and rents + indirect business taxes. Equivalently, value added is total sales - the costs of all non-labor inputs.