

ECONOMIC VALUATION OF NATIONAL PARK SYSTEM VISITATION

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Application of Count Data Models with
Visitor Services Project Data

Prepared for: National Park Service
Environmental Quality Division

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TABLE OF CONTENTS

TABLE OF CONTENTS	1
LIST OF TABLES.....	2
EXECUTIVE SUMMARY	4
1.0 INTRODUCTION AND OBJECTIVES	9
2.0 METHODS	11
2.1 Travel Cost Model Specification	11
2.2 Estimation of Benefits.....	13
3.0 DATA SOURCES.....	14
3.1 Visitor Services Project Data.....	14
3.2 Yellowstone National Park Survey Data	18
4.0 MODEL SPECIFICATION.....	21
4.1 VSP Model Specification	21
4.2 Yellowstone 2005 Data Model Specification.....	23
5.0 ANALYSIS AND RESULTS.....	25
5.1 Visitor Services Project Data Analysis and Results.....	25
5.2 Yellowstone NP Study Data Analysis and Results.....	35
WORKS CITED.....	37
APPENDIX A: VISITOR SERVICES PROJECT DATA INCLUDED IN ANALYSIS	38
APPENDIX B: REPORTED MODELS: FULL PARAMETER ESTIMATES AND SIGNIFICANCE..	45
APPENDIX C: SENSITIVITY ANALYSIS: ESTIMATED MODEL COEFFICIENTS, SIGNIFICANCE AND ESTIMATED NEV PER TRIP VALUES-FULL IRS REIMBURSEMENT RATE.....	58
APPENDIX D: VSP SURVEYS REVIEWED FOR THIS ANALYSIS.....	76
APPENDIX E: MASTER CATALOGUE OF VSP SURVEY QUESTIONS	83

LIST OF TABLES

Table ES1. Summary of average Estimated NEV per Trip Values, by NPS Unit Type and by NPS Region..... 5

Table ES2. Visitor Services Project Data Net Economic Value per Trip Estimates..... 6

Table ES3. Estimated Net Economic Value Per Visitor Trip for Primary Purpose and Secondary Purpose Visits. 8

Table 4. Distribution of VSP Park Surveys with Adequate Travel Cost Model Data by NPS Unit Type and Region..... 15

Table 5. Distribution of NPS Units by Survey Year and NPS Region. 16

Table 6. Distribution of Surveys across States..... 16

Table 7. Average VSP Survey Response Rate by Survey Year. 17

Table 8. Data Availability in VSP Survey Database..... 17

Table 9. Distribution of VSP Survey Sample Sizes and Response Rates by Unit Type. 18

Table 10. Distribution of Entrance Station Survey Responses by Entrance and Month. 19

Table 11. Total Response Rates, by Survey Wave..... 20

Table 12. Summary Characteristics of Count Data Model Variables for Yellowstone NP 2005 Data..... 20

Table 13. Variables Utilized in VSP Count Data Modeling and Estimation..... 22

Table 14. Variables Used in the Specification of the Yellowstone NP Count Data Visitation Model. 24

Table 15. VSP Travel Cost Parameter Fitted Model Results. 26

Table 16. VSP Data Net Economic Value per Trip Estimates. 28

Table 17. Estimated VSP Count Data Model Travel Cost and Interaction Parameters: Parks with Primary Purpose Information..... 30

Table 18. Estimated Per Trip WTP Estimate for Models of Park Visitation with Primary Purpose Interaction Terms..... 31

Table 19. Sensitivity Analysis of Model Specification: Independence and Shenandoah National Parks..... 33

Table 20. Comparison of Current Study and Heberling and Templeton Results Using Consistent Samples and Travel Costs. 34

Table 21. Yellowstone NP 2006 Study Data, Estimated Travel Cost Model of Willingness to Pay..... 35

Table 22. Estimated WTP per Trip, Yellowstone Survey Data..... 35

Table 23. Comparison of Independent Yellowstone NP Models of Count-Data WTP..... 36

Table 24. Data Set Park Descriptive Information: A..... 39

Table 25. Data Set Park Descriptive Information: B 41

Table 26. Data Set Park Descriptive Information: C..... 43

Table 27. Estimated Parameters and Significance: Reported Results, FULL Set of Estimated Park Models..... 46

Table 28. Estimated Parameters and Significance: Reported Results, Set of Estimated Park Models with Primary Purpose Variables. 54

Table 29. Sensitivity Analysis: Full Park Unit Set, Primary Travel Cost Parameter Estimates, Full IRS Reimbursement Rate per Mile..... 59

Table 30. Sensitivity Analysis: Full Park UNit Set, Estimated NEV per Trip, comparison of Full IRS Reimbursement Rate to IRS Charity Rate..... 61

Table 31. Sensitivity Analysis: Full Estimated Models for all Estimated NPS Units-Full IRS Reimbursement Rate. 63

Table 32. Sensitivity Analysis: Set of Parks with Primary Purpose Data, Key Parameters-Full IRS Reimbursement Rate..... 70

Table 33. Sensitivity Analysis: Set of Parks with Primary Purpose Data, NEV per Trip Estimates- Full IRS Reimbursement Rate.....71

Table 34. Sensitivity Analysis: Estimated Models for Parks with Primary Purpose Data-Full IRS Reimbursement Rate.....72

EXECUTIVE SUMMARY

This report examines the potential for the use of count data methods and existing NPS data series collected across a wide spectrum of park units by the Visitor Services Project (VSP) to estimate recreation use values for units of the U.S. National Park System within the travel cost modeling framework.

The study followed the methods and assumptions of (Heberling & Templeton, 2009) and (Bowker, Starbuck, English, Bergstrom, Rosenberger, & McCollum, 2009). Of the 234 park and year-specific data sets in the VSP system, 72 were found to have sufficient data to estimate count data models of willingness to pay (WTP). Of these, 65 parks data sets were used to estimate successfully converged models of willingness to pay. A second subset of parks (20) included data on the primary destination of the visitor. For this sample, separate estimates of visitor WTP for primary destination and non-primary destination visits were calculated. Travel cost models were also estimated for a second data set, based on a year-long survey of Yellowstone NP. This data set has a more complete set of potential variables than the VSP. For example, it includes individual income data and provides a point of comparison to the VSP models.

The methods used included conservative assumptions from both Heberling and Templeton and from Bowker et al. The models estimated provided generally highly significant estimated parameters on travel cost, and yielded a consistent picture of trip values associated with NPS unit visitation for a broad spectrum of park types and locations.

Examination of the consistency and sensitivity of the study results to differing model specifications found the models as estimated were generally robust, and our results matched those estimated from the park studied by Heberling and Templeton (Great Sand Dunes NP and Preserve). The methods applied in this study resulted in a significant increase in the number of estimates of trip WTP associated with NPS visitation. Additionally, the results suggest that the VSP could be modified slightly to collect a core of data that would allow the efficient estimation of models of visitor WTP for an even wider spectrum of park units in the future.

Table ES1 shows average estimated net economic value per person visit across the full set of robustly estimated park units. Several parks with very small sample sizes or non-significant parameter estimates were omitted from this table in order to not skew the averages with less reliable estimates. The table shows significant variation across regions and NPS unit types.

These findings add significantly to the set of available recreational visitors' willingness-to-pay estimates for national park units. Recent literature reviews (Kaval & Loomis, 2003) (Duffield, Neher, & Patterson, 2009) identified visitor trip value estimates for 25 separate NPS units. By comparison, this study provides recreational estimates for an additional 52 park units not previously available.

TABLE ES1. SUMMARY OF AVERAGE ESTIMATED NEV PER TRIP VALUES, BY NPS UNIT TYPE AND BY NPS REGION

Type of NPS Unit	NPS Region						
	Inter-mountain	Midwest	Nations Capitol	Northeast	Pacific West	Southeast	Total
Memorial			\$52		\$268		\$160
National Battlefield						\$55	\$55
National Historic Park	\$54		\$135	\$171	\$195		\$156
National Historic Site	\$174	\$98		\$237	\$139		\$153
National Lakeshore		\$127					\$127
National Monument	\$87	\$101		\$169	\$100	\$94	\$115
National Memorial		\$126		\$214			\$155
National Military Park						\$96	\$96
National Park	\$125	\$97		\$72	\$130	\$97	\$109
National Park & Preserve						\$111	\$111
National Reserve				\$152			\$152
National Recreation Area	\$72			\$156		\$52	\$93
National Seashore				\$79		\$42	\$61
Other			\$80		\$286	\$94	\$153
Total (# of estimates)	\$106 (6)	\$110 (12)	\$89 (3)	\$159 (13)	\$156 (15)	\$83 (16)	\$122 (65)

Table ES2 shows estimated NEV per trip for the 65 park surveys in the VSP dataset with adequate data for estimation. Consistent with the most conservative methods used by (Heberling & Templeton, 2009), and (Bowker, Starbuck, English, Bergstrom, Rosenberger, & McCollum, 2009), these estimates are based on use of the IRS charity deduction rate for mileage, and on the assumption that visitors with key missing responses have taken the most conservative number of trips to the parks.

TABLE ES2. VISITOR SERVICES PROJECT DATA NET ECONOMIC VALUE PER TRIP ESTIMATES.

PARK	PARKNAME	TYPE	REGION	YEAR	NEV/ PERSON / TRIP
ACAD	Acadia National Park	NP	NER	2009	\$ 72.70
BICY	Big Cypress National Preserve	NP&PRES	SER	2007	\$ 110.92
BISC	Biscayne National Park	NP	SER	2001	\$ 70.17
BRCA	Bryce Canyon National Park	NP	IMR	1997	\$ 122.58
CATO	Catoctin Mountain Park	OTHER	NCR	2002	\$ 79.90
CHAT	Chattahoochee River National Recreation Area	NRA	SER	1998	\$ 51.87
CHOH	C & O Canal National Historical Park	NHP	NCR	2003	\$ 135.27
COLO	Colonial National Historical Park (Jamestown)	NHP	NER	2001	\$ 228.81
COWP	Cowpens National Battlefield	NB	SER	2003	\$ 24.34
CRLA	Crater Lake National Park	NP	PWR	2001	\$ 179.61
CRMO	Craters of the Moon National Monument & Preserve	NM	PWR	2004	\$ 155.37
CUIS	Cumberland Island National Seashore	NS	SER	1998	\$ 42.10
CUVA	Cuyahoga Valley National Park	NP	MWR	2005	\$ 105.10
DRTO	Dry Tortugas National Park	NP	SER	1995	\$ 80.13
DRTO	Dry Tortugas National Park	NP	SER	2002	\$ 104.21
EBLA	Ebey's Landing National Historical Reserve	OTHER	PWR	2007	\$ 285.87
EFMO	Effigy Mounds National Monument	NM	MWR	2004	\$ 71.08
EVER	Everglades National Park	NP	SER	1996	\$ 161.43
EVER	Everglades National Park	NP	SER	2002	\$ 108.95
EVER	Everglades National Park	NP	SER	2008	\$ 111.50
FIIS	Fire Island National Seashore	NS	NER	2008	\$ 79.34
FODO	Fort Donelson National Battlefield	NB	SER	2007	\$ 73.35
FOLS	Fort Larned National Historic Site	NHS	MWR	2009	\$ 121.97
FOST	Fort Stanwix NM	NM	NER	2003	\$ 266.25
FOSU	Fort Sumter National Monument	NM	SER	2005	\$ 94.36
GATE	Gateway National Recreation Area - Floyd Bennett Field Visitor Study	NRA	NER	2003	\$ 155.87
GEWA	George Washington Birthplace National Monument	NM	NER	2004	\$ 71.77
GLCA	Glen Canyon National Recreation Area	NRA	IMR	2007	\$ 71.61
GOSP	Golden Spike National Historic Site	NHS	IMR	2006	\$ 173.89
GRSA	Great Sand Dunes National Park & Preserve	NM	IMR	2002	\$ 86.67
GRSM	Great Smoky Mountains National Park	NP	SER	1996	\$ 39.93
HOFU	Hopewell Furnace National Historic Site	NHS	NER	2002	\$ 147.97
HOME	Homestead National Monument of America	NM	MWR	2009	\$ 130.68
INDE	Independence National Historical Park	NHP	NER	2007	\$ 164.88
INDU	Indiana Dunes National Lakeshore	NL	MWR	2009	\$ 49.97
JELA	Jean Lafitte National Historical Park & Preserve	OTHER	SER	1998	\$ 93.78
JOFL	Johnstown Flood National Memorial	NMEM	NER	2005	\$ 214.37
KIMO	Kings Mountain National Military Park	NMP	SER	2006	\$ 95.89
KLSE	Klondike Gold Rush National Historic Site	NHS	PWR	2009	\$ 88.29
KNRI	Knife River Indian Village NHS	NHS	MWR	2003	\$ 109.46
LIBO	Lincoln Boyhood Home National Memorial	NMEM	MWR	1997	\$ 188.67
LIHO	Lincoln Home National Historic Site	NHS	MWR	2005	\$ 63.69

PARK	PARKNAME	TYPE	REGION	YEAR	NEV/ PERSON / TRIP
LOWE	Lowell National Historical Park	NHP	NER	1997	\$ 120.23
MANZ	Manzanar National Historic Site	NHS	PWR	2004	\$ 190.23
MORA	Mount Rainier National Park	NP	PWR	2000	\$ 79.40
MORU	Mount Rushmore National Memorial	NMEM	MWR	2007	\$ 63.44
NECA	Iwo Jima/Netherlands Carillon Memorials	MEM	NCR	1998	\$ 51.59
NERI	New River Gorge National River	NR	NER	2004	\$ 152.11
OLYM	Olympic National Park	NP	PWR	2000	\$ 134.57
PINN	Pinnacles National Monument	NM	PWR	2002	\$ 45.49
PIRO	Pictured Rocks National Lakeshore	NL	MWR	2001	\$ 264.09
SAAN	San Antonio Missions National Historical Park	NHP	IMR	1994	\$ 53.91
SAFR	San Francisco Maritime National Historical Park	NHP	PWR	1995	\$ 208.85
SAFR	San Francisco Maritime National Historical Park	NHP	PWR	2005	\$ 182.00
SAGA	Saint-Gaudens National Historic Site	NHS	NER	2004	\$ 325.18
SEKI	Sequoia & Kings Canyon National Parks and Sequoia National Forest	NP	PWR	2001	\$ 123.44
SHEN	Shenandoah National Park	NP	NER	2001	\$ 71.13
SLBE	Sleeping Bear Dunes National Lakeshore	NL	MWR	2009	\$ 65.71
STRI	Stones River National Battlefield	NB	SER	2002	\$ 68.38
USAR	USS Arizona Memorial	MEM	PWR	2000	\$ 267.57
VOYA	Voyageurs National Park	NP	MWR	1997	\$ 88.41
YELL	Yellowstone National Park	NP	IMR	2006	\$ 127.17
YOSE	Yosemite National Park	NP	PWR	2005	\$ 152.72
YOSE	Yosemite National Park	NP	PWR	2008	\$ 106.96
YOSE	Yosemite National Park	NP	PWR	2009	\$ 134.08

Table ES3 shows the NEV estimates per visitor trip for those trips where the NPS unit studied was the primary destination and for those where it was not the primary destination. Overall, trips where the NPS unit was the primary destination were valued at about one-half the NEV of those where visiting the NPS unit was not the primary purpose of the trip. This result is consistent with both theory and the findings of Heberling and Templeton.

This analysis of existing VSP count data within the framework of an individual observation travel cost model of willingness to pay provides a significant number of new estimates of visitor trip values for a wide spectrum of NPS units. Moreover, the analysis suggests several areas where both the results of this study could be extended and where the VSP survey process could more efficiently and broadly facilitate future estimation of NPS visitor values within this same framework.

TABLE ES3. ESTIMATED NET ECONOMIC VALUE PER VISITOR TRIP FOR PRIMARY PURPOSE AND SECONDARY PURPOSE VISITS.

PARKNAME	NPS TYPE	NPS REGION	YEAR	Primary Purpose NEV/Trip	Secondary Purpose NEV/Trip	Ratio of Primary NEV to Secondary NEV
C & O Canal National Historical Park	NHP	NCR	2003	\$226.67	\$108.54	209%
Ebey's Landing National Historical Reserve	OTHER	PWR	2007	\$95.00	\$407.82	23%
Effigy Mounds National Monument	NM	MWR	2004	\$15.24	\$97.56	16%
Fort Donelson Nat. Battlefield	NB	SER	2007	\$30.79	\$96.11	32%
Fort Larned National Historic Site	NHS	MWR	2009		\$156.55	
Great Sand Dunes National Park & Preserve	NM	IMR	2002	\$57.69	\$99.16	58%
Great Smokey Mtns. National Park	NP	SER	1996	\$37.88	\$45.97	82%
Hopewell Furnace National Historic Site	NHS	NER	2002		\$176.65	
Independence National Historical Park	NHP	NER	2007		\$166.28	
Kings Mountain National Military Park	NMP	SER	2006		\$126.63	
Knife River Indian Village NHS	NHS	MWR	2003		\$108.96	
Lincoln Boyhood Home National Memorial	NMEM	MWR	1997	\$25.52	\$351.43	7%
Lowell National Historical Park	NHP	NER	1997	\$73.67	\$183.73	40%
Mount Rushmore National Memorial	NMEM	MWR	2007		\$79.33	
New River Gorge National River	NR	NER	2004	\$42.02	\$82.46	51%
Pictured Rocks National Lakeshore	NL	MWR	2001	\$18.24	\$82.44	22%
Shenandoah National Park	NP	NER	2001	\$27.13	\$118.26	23%
Stones River National Battlefield	NB	SER	2002	\$42.11	\$131.77	32%
Averages				\$57.66	\$145.54	50%

Shaded cells not reported-based on non-significant parameters.

1.0 INTRODUCTION AND OBJECTIVES

This report examines the potential for the use of count data methods and existing NPS data series collected across a wide spectrum of park units by the Visitor Services Project (VSP) to estimate recreational use values for units of the U.S. National Park System within the travel cost modeling framework.

For many years, the NPS has sponsored the NPS Visitor Services Project through the University of Idaho (VSP (Visitor Services Project), 2007). The Visitor Services Project (VSP) has surveyed many of the NPS units and all VSP park reports are available on the VSP website. The VSP surveys an average of 10-12 park units per year, and since its inception has conducted 234 in-depth visitor surveys. Sample sizes for the VSP surveys tend to range from 500 to 1000 completed surveys, with the exception of some smaller sites where samples may be in the 250-500 range. Currently, the VSP personnel are finalizing the incorporation of the entire collection of VSP survey data into one unified database. While information gathered for each park varies, some data is collected for all park units.

(Heberling & Templeton, 2009) demonstrated the use of VSP data for a single park unit in order to estimate an individual observation travel cost model of visitor net willingness to pay for park visitation. The current study aims to expand this analysis to all park units within the VSP database for which the necessary origin-destination information and information on multi-destination and primary purpose trips is available.

The current study aims to extend the (Heberling & Templeton, 2009) analysis in two major respects:

- Increase the number of parks for which the analysis is conducted to as many of the 155 unique park units surveyed by the VSP as is practicable and possible given data limitations,
- Refine the travel distance and time variables in the travel cost models by utilizing actual route mapping software which calculates actual road miles and estimated driving time. This is a refinement over the use of a grand circle algorithm (point-to-point) distance estimate with an applied unique circuitry factor at the state level, as utilized by Heberling and Templeton.

The primary objectives of this study are to expand the work of Heberling and Templeton to multiple park units, and where possible make comparisons of estimated CS values across park types and, locations. Additionally, in cases where multiple survey datasets exist for individual park units comparisons will be made to examine the stability of estimates across surveys, and years.

The National Park Service has a need for valuing ecosystem services, including recreational use, for policy, management, planning, and natural resource damage assessment. The National Park System protects a diverse set of nationally significant ecosystems and cultural and historical resources. The areas set aside for their natural values include forest, grassland, tundra, desert, estuary or river system and may contain impressive landforms such as mountains, mesas, thermal areas, and caverns and provide habitat for a diversity of wildlife and plant life. These ecosystems provide a variety of ecosystem regulation, habitat, production and information functions including climate regulation, water regulation, water supply, nutrient recycling, refugium, and genetic resources. The founding legislation for the national parks in 1916 defined the dual mandate under which these parks are managed: “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (U.S. Department of Interior, 1995).

The preservation side of the mandate limits the range of services that society derives from these ecosystems, for example generally excluding water resource development, logging, mining, grazing, and hunting. Given that these parks are by definition nationally significant and unique, passive use values for preservation are potentially important. Total valuation studies applied to national parks include (Randall & Stoll, 1983) and their study of the value of visibility in the Four Corners area near Grand Canyon National Park. (Welsh, Bishop, Phillips, & Baumgartner, 1995) measured the values associated with preservation of the riparian ecosystem and endangered fish species, also in the Grand Canyon, and (Duffield, Neher, & Patterson, 2006) estimated the values associated with wolf recovery in Yellowstone. A general finding is that these ecosystems and the associated biodiversity and unique natural features are highly valued, and that in many cases the scale of the market is national. However this literature is small and each setting is unique, providing little opportunity to transfer estimates across parks.

The “use and enjoyment” side of this mandate is manifested in an estimated 275 million visits to the system in 2008 (National Park Service, 2008). These visits for recreational, aesthetic, cultural and historical uses are an important component of the value derived from national parks. It is noteworthy that the need to quantify the value of recreation was recognized at an early date by the National Park Service. The Service’s Director in the early 1940s, Roy Prewitt, requested ideas on how to estimate economic values for national parks. (Hotelling, 1947) in his response to this request provided the basic idea for the travel cost demand model, and one of the earliest applications of this approach provided estimated consumer surplus values for, among other sites, Glacier and Yosemite National Parks (Clawson, 1959).

Regulatory and land management agencies are often required to assess the full economic benefits and costs of management and policy decisions. For example under Executive Order 12866, U.S. federal agencies must evaluate the benefits and costs from every economically-significant regulatory action. However, even if funding was available to complete original studies as needed, rarely can studies be completed in a timely way because of another federal policy: the Paperwork Reduction Act of 1995, which requires a lengthy Office of Management and Budget review (often taking up to a year or more) of survey sample plans and instruments for federally funded research prior to conducting any survey work. Not all proposed surveys are approved. Given these time and resource constraints, it is not feasible to conduct original research for every regulatory issue that arises.

The use of previously collected NPS data to estimate new models of visitor WTP, as outlined in this report, provides the National Park Service with an additional tool to determine the economic significance of the NPS park units to the visiting public.

2.0 METHODS

The method used in this analysis for estimating the value of a trip to specific NPS units is a variant of the individual observation travel cost model. This model explains the number of trips an individual has taken to a specific park unit during the previous 12 months as a function of the cost (and by proxy, the distance) associated with making the trips to the park from their home. At its base, the TC model can be estimated using this minimal data.

While the VSP survey questions have evolved over the years of the survey's existence, there are a number of key questions that are included in many of the park surveys which are necessary for estimation of the TC models. While not a majority, many of the VSP questionnaires included questions on the number of trips taken to the park in the past 12 months. The number of trips is always a nonnegative, non-zero integer. We follow the standard approach for estimating the individual travel cost model (e.g., (Shaw, 1988); (Englin & Shonkwiler, 1995); (Hellerstein & Mendelsohn, 1993); (Cameron & Trivedi, 1998)). Recent examples of studies focused public lands include those by (Heberling & Templeton, 2009), who examined Great Sand Dunes National Park VSP data, and (Bowker, Starbuck, English, Bergstrom, Rosenberger, & McCollum, 2009) who used National Forest Service visitor data to estimate a wide range of values for visitor trips to national forest lands. (Donovan & Champ, 2009), also estimated values associated with elk viewing in Oregon.

2.1 Travel Cost Model Specification

The standard travel cost model is defined as

$$Trips_i = f(s_i; \beta) + e_i$$

where $Trips_i$ is the number of observed trips that the i th visitor would take to the national park in a specific time period; s_i is the vector of explanatory variables for the i th visitor including travel costs to the site, income, age, type of trip, group size, travel costs to substitute sites, etc.; β is a vector of unknown parameters; and e_i is the error term. The most widely applied models for count data are the Poisson regression model and negative binomial regression model (Cameron & Trivedi, 1998). For the Poisson, (Shaw, 1988) outlined several challenges associated with modeling count data collected through on-site visitor surveys. Shaw noted that on-site data are characterized by the following:

Non-negative integers: the number of visits taken to the site by the individual during a given time period is a count of non-negative integer values;

- Truncation: only those individuals who participate in recreation and who have taken at least one visit are sampled, thus the sample is truncated at zero and contains only positive observations;
- Endogenous Stratification: the probability of being included in the sample increases as the number of visits taken by the individual increases.

(Shaw, 1988) identified endogenous stratification as being proportional to the number of trips taken to a site, and derived a Truncated Stratified Poisson estimator that accounted for the non-negative count data and endogenous stratification.

While the Shaw formulation of the Truncated Stratified Poisson estimator corrects for two common problems associated with modeling on-site count data, the adjustment is still based on a Poisson process, where the mean and variance are restricted to equality. Recreational visitation data often displays significant dispersion around the mean; the trips variable has a large variance relative to its mean. This over-dispersion of trips can lead to unexplained heterogeneity and a form of heteroskedasticity in the demand model (Cameron & Trivedi, 1998).

To correct for the potential problem of inconsistency of the Poisson estimator resulting from the presence of over-dispersion in the data, while correcting for the non-negative (and zero-truncated) integer nature of on-site data, (Englin & Shonkwiler, 1995) derived a model that simultaneously corrects for the three primary problems associated with on-site count data analysis: overdispersion relative to the Poisson; truncation at zero, and endogenous stratification due to oversampling of frequent visitors to the site. The log-likelihood function associated with the Englin and Shonkwiler model as utilized by (Heberling & Templeton, 2009) is:

$$\ln L = \sum_{i=1}^n [\ln Trips_i + \ln(\Gamma(Trips_i + \alpha^{-1})) - \ln(Trips_i!) - \ln(\Gamma(\alpha^{-1})) + Trips_i \ln \alpha + (Trips_i - 1) \ln \lambda_i - (Trips_i + \alpha^{-1}) \ln(1 + \alpha \lambda_i)]$$

Where

$$E[Trips_i | s_i] = \lambda_i + 1 + \alpha_i \lambda_i$$

And

$$Var[Trips_i | s_i] = \lambda_i (1 + \alpha_i + a_i \lambda_i + a_i^2 \lambda_i)$$

Heberling and Templeton discuss selection and comparison of model results among the Poisson, Negative Binomial and Negative Binomial specification developed by Englin and Shonkwiler. Their results support use of the Englin and Shonkwiler specification of the Log-likelihood function in estimating count models from on-site visitation data. This approach is also utilized in a recent large-scale analysis of National Forest visitation (Bowker, Starbuck, English, Bergstrom, Rosenberger, & McCollum, 2009). Based on the preliminary finding demonstrating over-dispersion for the Poisson model, the current study applies the negative binomial specification as defined by (Englin & Shonkwiler, 1995).

2.2 Estimation of Benefits

The per-visit net economic value can be directly estimated from the estimated coefficients of the travel cost count data models. Specifically, consumer surplus per visitor trip is calculated as

$$CS / Trip = (-1 / \beta_{Travel\ cost})$$

In the case of the subset of models that estimate both a coefficient for the travel cost explanatory variable and for in interaction term between the travel cost variable and an indicator variable for whether the visit to the NPS unit was the primary destination of the visitor (variable primary take a value of “1”) or a secondary or unplanned destination (variable primary takes a value of “0”), two calculations of consumer surplus are possible. For those visitors and trips where the NPS unit was the primary destination on the trip from home, the consumer surplus is calculated as

$$CS_{Trip(PrimaryDestination)} = \frac{-1}{(\beta_{TC} + \beta_{Primary})}$$

Where Primary is the interaction term TC*Primary purpose trip. When this interaction term is included in the model, the estimated CS for secondary purpose or unplanned trips to the park unit are calculated again simply as

$$CS_{Trip(secondaryDestination)} = \frac{-1}{\beta_{TC}}$$

The measure of WTP reported in the following analysis is consumer surplus (CS) per visitor trip.

Estimation of the maximum likelihood models of WTP was completed using the SAS NLMIXED procedure. The modeling results from the SAS estimation were verified by an independently written “R” program.

3.0 DATA SOURCES

Two primary data sources were utilized in this study. The primary data source, and the focus and purpose of this analysis was the master database of the Visitor Services Project (VSP (Visitor Services Project), 2007). A secondary data source was the 2005 Yellowstone NP visitor survey (Duffield, Neher, & Patterson, 2006). This year-long survey of visitors to a high-profile NPS unit provides a rich source of data necessary for estimation of count-data models of visitation and unlike many of the VSP data sets, is complete with respect to covariates.

3.1 Visitor Services Project Data

In 1982, the NPS started the Visitor Services Project (VSP) at the University of Idaho Cooperative Park Studies Unit (VSP 2007). The project conducts a wide spectrum of visitor studies for units of the NPS across the country. While the surveys designed and administered over the years by the VSP since 1982 have evolved to a degree, many similar, or identical, questions have been administered across the surveys. Questions have included demographics, opinions, and trip characteristics. Additionally, some of the surveys have asked for information about how the visit fit into visitors' travel plans, the purpose of the trip, and other places visited in addition to the park. They have also asked about how much time was spent at the park, overnight stays and location, type of personal group, characteristics of group members including age, Zip Code, number of visits in the past 12 months.

The Visitor Services Project (VSP) has conducted 234 park-specific surveys since the project began in 1982. Appendix D shows a complete list of surveys completed by the VSP during that time. Additionally, Appendix E contains the full VSP question catalogue. These questions are the complete set of survey questions from which current VSP surveys are constructed.

As mentioned, not all VSP surveys included the questions and associated data necessary to estimate an individual observation travel cost model. At its base, this type of model requires data on the number of trips taken to the park unit during a certain period (in the case of the VSP questions, it was the previous 12 months, including the current trip), and the cost of traveling (or a proxy thereof) from the visitors' home to the park. Additional data, on trip purpose, characteristics, and visitor characteristics improve the theoretical structure of the estimated model. An examination of the VSP database found 72 park unit surveys with data necessary to undertake count data modeling. Appendix A shows the full list of 72 parks with both number of trips and travel cost-compatible data. Four of these parks proved to have inadequate sample sizes or unique characteristics/locations which made estimation of the travel cost model unfeasible.

Table 4 shows the distribution of NPS units with the necessary count model data by NPS region and NPS unit type. The largest share of units in the table are classified as National Parks. Additionally, the parks in the sample are fairly well distributed across the regions of the NPS system with only Alaska and the North Central regions being lightly represented. The 72 parks with count model data represent a good cross section of the NPS system both in terms of type of unit and location of unit.

It is of note that (Kaval & Loomis, 2003) Identified 63 NPS park-specific estimates of WTP per trip within the literature of recreational resource economics. Additionally, (Duffield, Neher, & Patterson, 2009) identified

and estimated an additional 65 per trip WTP estimates. However, these 128 estimates covered only 25 unique NPS units. This analysis, with its 65 additional park-specific estimates represents an over 50% increase in the number of NPS park estimates available to resource managers. Additionally, this analysis provides NEV estimates for 52 new NPS units not previously studied in the literature. This represents an over 200% increase in the number of NPS units with available recreational use value estimates.

TABLE 4. DISTRIBUTION OF VSP PARK SURVEYS WITH ADEQUATE TRAVEL COST MODEL DATA BY NPS UNIT TYPE AND REGION

Type	Region							Grand Total
	Alaska	Inter Mountain	Mid West	North Central	North East	Pacific West	South East	
Memorial				1		1		2
National Battlefield							3	3
National Historic Park		1		1	3	2		7
National Historic Site		1	3		3	2		9
National Lakeshore			3					3
National Monument		2	2		2	2	1	9
National Memorial			2		1			3
National Marine Park							1	1
National Park	1	2	2		2	9	8	24
National Park and Preserve							1	1
National Reserve					1			1
National Recreation Area		2			1		1	4
National Seashore					1		1	2
OTHER						1	1	2
PARK				1				1
Total	1	8	12	3	14	17	17	72
Total of VSP Studies with adequate sample sizes								68
Park estimates identified by (Kaval & Loomis, 2003)								63
Park Estimates identified by (Duffield, Neher, & Patterson, 2009)								65
Total Park estimates including current study								196
Number of unique NPS units with estimated values prior to this analysis								25
Additional unique NPS units with estimated use values provided in this analysis								52

Table 5 shows the distribution of surveys in our sample by survey year and NPS region. The VSP survey instruments have evolved and been standardized over time. Even though the VPS project has been around since the 1980s, no surveys with adequate data to estimate travel cost count data models were conducted prior to 1994. Additionally, prior to 2000, surveys with the necessary count model data were the exception in the VSP program. Even in recent years, it is a minority of surveys that collect the necessary basic count model information.

TABLE 5. DISTRIBUTION OF NPS UNITS BY SURVEY YEAR AND NPS REGION.

Survey Year	Region							Grand Total
	Alaska	Inter Mountain	Mid West	North Central	North East	Pacific West	South East	
1994		1						1
1995						1	1	2
1996							3	3
1997		1	2		1			4
1998				1			3	4
2000						5		5
2001			1		2	1	1	5
2002		1		1	1	2	3	8
2003			1	1	2		1	5
2004			1		3	2		6
2005		1	2		1	2	1	7
2006	1	2			1		1	5
2007		2	1		1	1	2	7
2008					1	1	1	3
2009			4		1	2		7
Total	1	8	12	3	14	17	17	72

Table 6 shows the number of surveyed parks within our sample by individual US State location. Out of the 39 States considered, California and Florida contain the most parks, with 8 and 7 respectively.

TABLE 6. DISTRIBUTION OF SURVEYS ACROSS STATES.

State	Total Surveys	State	Total Surveys	State	Total Surveys
AZ, UT	1	ID	1	NY	2
DC, MD, WV	1	IL	1	OH	1
ID, MT, WY	1	IN	2	OK	1
KY, TN	1	KS	1	OR	1
NC, TN	2	LA	1	PA	3
NJ, NY	1	MA	2	SC	3
AK	1	MD	1	SD	1
CA	8	ME	1	TN	1
CO	1	MI	2	TX	1
FL	7	MO	1	UT	3
GA	2	ND	1	VA	4
HI	3	NE	1	WA	4
IA	1	NH	1	WV	1

Table 7 shows the average survey response rate organized by year, ranging from 1994-2009. The years with the highest average survey response rate is 1996 and 1997. The lowest average response rate is 62%, and the highest is 81%. It should be noted that the average survey response rates shown in Table 7 represent only the VSP surveys with count model data (the subsample of 72 park-specific surveys). However, consistent

with much other survey research experience, there is a trend toward marginally lower response rates to the on-site surveys over the time frame examined.

TABLE 7. AVERAGE VSP SURVEY RESPONSE RATE BY SURVEY YEAR.

Survey Year	Average Response Rate
1994	0.75
1995	0.74
1996	0.80
1997	0.81
1998	0.75
2000	0.74
2001	0.76
2002	0.77
2003	0.71
2004	0.75
2005	0.66
2006	0.71
2007	0.62
2008	0.63
2009	0.66

Table 8 details the total number of VSP surveys that contain specific variables commonly used in (or necessary for) count data modeling of visitation willingness to pay. Of the 234 VSP surveys administered thus far, 72 surveys contain home zip codes, visits, and age (zip codes and visits being the two key variables needed in construction of our count data models.. 71 surveys also include a multi-day variable, which indicates whether the visitor stayed more than 1 day at the site. 70 surveys also include the variable of group size. 59 of the 72 surveys with primary modeling information also include information on group type. One variable commonly included in travel cost modeling is an indicator variable indicating whether the trip taken was the primary destination for the visitor or visitor group. In total, 23 of the set of 72 surveys contained primary purpose information. Of these, 65 models of WTP were estimated.

TABLE 8. DATA AVAILABILITY IN VSP SURVEY DATABASE.

Data contained in Survey	Total Number of Surveys
Total VSP Surveys	234
Surveys with Zip Codes, Visits, and Age	72
Surveys that also include Multi-Day	71
Surveys that also include Group Size	70
Surveys that also include Group Type	59
Surveys that also include Primary Purpose	23

Table 9 shows the minimum, the maximum, the average sample size and the average survey response rate by the type of NPS park unit in the sample of 72 surveys considered in this analysis. While sample sizes vary somewhat (often by design of the VSP program), sample sizes are generally in the 300-400 survey responses range. Additionally, response rates generally are fairly consistent across type of NPS unit surveyed.

TABLE 9. DISTRIBUTION OF VSP SURVEY SAMPLE SIZES AND RESPONSE RATES BY UNIT TYPE.

Type	Number of Parks Surveyed	Sample Size			Average of Response Rate
		Min	Max	Mean	
Memorial	2	468	576	522	69.0%
National Battlefield	3	284	301	291	74.5%
National Historic Park	7	401	805	555	69.6%
National Historic Site	9	220	462	290	75.7%
National Lakeshore	3	499	696	567	65.8%
National Monument	9	197	426	308	72.0%
National Memorial	3	232	647	431	73.6%
National Marine Park	1	228	228	228	66.5%
National Park	24	223	945	635	73.8%
National Park and Preserve	1	634	634	634	63.3%
National Reserve	1	552	552	552	65.8%
National Recreation Area	4	475	704	588	59.8%
National Seashore	2	295	636	466	70.9%
Other	3	362	554	462	72.4%

Overall, 72 park-specific survey data sets were downloaded from the VSP database for analysis in this study. The parks represent a broad cross-section of the NPS system both in terms of spatial distribution, and in terms of type of park unit surveyed. Sample sizes for the surveys appear to be adequate to support model estimation. Additionally, response rates are relatively high, implying that non-response bias may not be a major concern.

3.2 Yellowstone National Park Survey Data

The 2005 Yellowstone Visitor Survey was designed as a year-long random survey of park visitors. This data set is considered here because samples were relatively large, and the full suite of plausible covariates, including number of trips, group size, primary purpose and income were available. The sampling plan for this group was designed to survey a generally equal number of park visitors at park entry gates in each of the four seasons. In order to achieve this, the sampling interval was adjusted for each season to account for the very large differences in total park visitation in the different seasons. The goal of balanced sample sizes across seasons was chosen to yield sample sizes in non-summer seasons that would allow meaningful comparison of trip and visitor characteristics across seasons.

Sampling allocation and sampling intervals were based on total park recreational visitation, as estimated by the NPS. The NPS estimated the number of visitors in 2005 to be approximately 2.8 million visitors. The vast majority of those visitors (almost 2 million) visited during the three summer months of June, July, and August.

The 2004 Yellowstone National Park visitation was used as a basis for both allocating survey effort throughout the survey year, and for weighting final survey responses to more closely represent the distribution of actual visitation across seasons and entrances.

Table 10 shows the actual distribution of survey responses across months and entrances. In total, the entrance sample yielded 1,512 completed surveys. Of these, approximately 97% could be matched with a specific entrance gate or month of visit.

TABLE 10. DISTRIBUTION OF ENTRANCE STATION SURVEY RESPONSES BY ENTRANCE AND MONTH.

MONTH	NORTH	WEST	SOUTH	EAST	NE	Unknown	TOTAL
January	16	-	1	4	-	25	46
February	66	8	2	-	-	2	78
March	33	-	-	-	-	-	33
April	23	-	-	-	-	-	23
May	90	14	113	23	-	4	244
June	57	67	86	59	19	13	301
July	42	101	40	31	21	15	250
August	15	78	33	29	-	-	155
September	36	87	13	35	-	10	181
October	21	73	6	17	-	8	125
November	6	-	-	-	-	-	6
December	1	-	-	-	-	29	30

Table 10 details the distribution of the survey sampling waves across the sampling year. Table 11 shows the combined survey response rates by survey wave. Overall, the response rate to the survey was 66.4%. Across waves this response varied from a low of 57.1% for the mid-summer wave 9 to a high of over 75%. In general, response rates were characterized by being highest in the shoulder and winter seasons and lowest in the summer season.

TABLE 11. TOTAL RESPONSE RATES, BY SURVEY WAVE

Wave	Mailed	Not Returned	Returned	Undeliverable	Response Rate
1	62	18	44	0	71.0%
2	195	54	141	0	72.3%
3	125	37	86	2	69.9%
4	39	10	29	0	74.4%
5	158	38	117	3	75.5%
6	217	66	147	4	69.0%
7	534	174	345	15	66.5%
8	358	126	223	9	63.9%
9	398	165	220	13	57.1%
10	441	152	280	9	64.8%
11	256	87	161	8	64.9%
12	105	33	72	0	68.6%
13	104	25	78	1	75.7%
TOTAL	2992	985	1943	64	66.4%

Table 12 shows the mean distance traveled to Yellowstone Park by season sampled. The greatest mean distance traveled occurs in the summer with 1995.2 miles, and the lowest mean distance traveled occurs in the fall with 981.6 miles. The mean distance traveled throughout the fall, spring, and summer seasons is 1131 miles.

Visitors to Yellowstone NP in the shoulder seasons, and particularly Spring, reported taking more trips to the park in the current year than did those visitors surveyed in the Summer season.

The Yellowstone NP survey also asked visitors a question on their household income level. This is one variable that theory suggests should be included in models of WTP. The VSP only included income questions in a very small number of surveys. Therefore, consistent with the methods of Heberling and Templeton, for the VSP data analysis, average census income for the visitor's home zipcode was used as a proxy for individual income. In the case of the Yellowstone NP 2005 data, the actual reported (and preferable) income level of visitors was included in the model specification.

TABLE 12. SUMMARY CHARACTERISTICS OF COUNT DATA MODEL VARIABLES FOR YELLOWSTONE NP 2005 DATA.

Season	Distance Mean	Trips		Income Mean
		Mean	Count	
Fall	981.6	2.3	322	88,075
Spring	1165.3	2.9	495	79,748
Summer	1195.2	1.8	477	85,076
Total	1131.0	2.3	1294	83,789

4.0 MODEL SPECIFICATION

4.1 VSP Model Specification

The VSP surveys were not designed to collect data needed for estimation of count data models of visitor willingness to pay. However, as noted previously, a significant number of the surveys did collect the minimum data necessary for estimation of these models. The structure of the VSP questions and the resulting data made it necessary for us to transform and augment the VSP data prior to estimating the models. The following discussion outlines the specification and sources for all variables used in the VSP survey count data models.

Trips The dependent variable in the TC models is number of trips taken to the NPS unit in the previous 12 month period (including the current trip). As was found by Heberling and Templeton, our analysis found many parks with insufficient variability in this dependent variable to estimate a model. Following their convention, we multiplied the number of trips reported by an individual by the number of people in the visitor’s personal travel group. Additionally, in a few cases where individuals reported taking zero trip (an impossibility since they were surveyed on one trip), the number of trips was set to 1 and then multiplied by group size to generate the final dependent trips variable. In the case of some parks, there was some item non-response to the trips question. In the cases where this response was missing, we employed the assumptions of Heberling and Templeton and set the number of trips equal to “1” (times the group size). This assumption is conservative in that it uses the minimum number of trips for the missing entries.

Travel Cost The 72 VSP surveys used in this analysis asked respondents for their home zip code. Previous count model visitation analyses (Heberling and Templeton) have used a “Great Circle” algorithm in conjunction with a state-specific “circuitry factor” to estimate one way distance between the home zip code and the park destination. In this analysis, we utilized the SAS statistical system, to run a program utilizing a call-up function to calculate the driving distance in miles between *Park Zip and Home Zip* using a Google Maps web link. The program also generated an estimated time of travel for each pair of zip codes. The distance generated was multiplied by two to represent a round-trip distance. The round-trip distance was then multiplied by the corresponding US private vehicle reimbursement rate for charity purposes set by the Internal Revenue Service (IRS) for the specific survey year. This rate was 14 cents per mile in most years, and 12 cents per mile in 1994-1996. The use of the IRS charity rate was adopted by Bowker et al. (2009) in their models of national forest trip values. The use of the charity rate is more conservative than the full IRS private vehicle mileage deduction rate used by Heberling and Templeton.

The choices of a mileage rate, and whether to include additional travel cost parameters such as travel time, have a direct bearing on estimated WTP. A sensitivity analysis of the estimated models using the full IRS mileage rate (as used by Heberling and Templeton) is included in Appendix C.

No information is available in the VSP data on how the visitor traveled to the park. In these calculations, we assume that everyone travels by vehicle and that all travelers face the same cost per mile. A final component of travel cost is the addition of the specific park entry fee to the estimated distance-based travel cost. Appendix A includes information on park entry fees for the set of NPS units included in the study.

Income As noted, information on visitor’s income was generally not collected in the VSP surveys. Therefore, we followed the method of Heberling and Templeton in using the median household income calculated by Zip Code for the 1999 Census. *Median Income* is adjusted for inflation to the corresponding survey year using the consumer price index.

Age The VSP surveys asked respondents their age. This specific demographic variable was entered untransformed into the models.

Family A dummy variable was constructed indicating whether the respondent was traveling with their family (coded as “1”) of with some other type of group or as an individual (coded as “0”).

Multiday An indicator variable was constructed indicating whether the visitor stayed overnight (visited the park on two days) on their trip. Multiday trips were coded as “1” and single day trips were coded as “0”.

Primary A subset of VSP surveys asked respondents whether the park unit they visited was the primary destination for their trip, or a secondary or unplanned destination. An indicator variable was created which took the value of “1” for primary destination trips, and “0” for all other trips. For surveys where information on primary destination trips was available, an interaction term was also created multiplying primary times travel cost in order to facilitate the estimation of WTP per trip estimates for both primary purpose trips and other trips.

Table 13 summarizes the variables utilized in the count data modeling for the VSP data.

TABLE 13. VARIABLES UTILIZED IN VSP COUNT DATA MODELING AND ESTIMATION.

Variable	Definition
Park Zip	National Park zip code
Home Zip	Visitor’s home zip code
Median Income	1999 Census median income by home zip code
Mileage Rate	IRS reimbursement rate per mile (specific to survey year)
Travel Cost	(round-trip road miles x mileage rate) / Group Size + entrance fee
Age	Visitor’s age
Visits	No. of visits within 1 year x Group Size
Group Size	No. of individuals in visitor’s group
Primary	=1 if visit was primary destination
Primary * Travel Cost	Interaction term between primary purpose trips and estimated round trip travel cost
Family	=1 if personal group was family
Multi-Day	=1 if visitor spent 1 or more days on-site

4.1.1 VSP Data Limitations

For a large-scale existing data source that was not designed to collect information for a count data model, the VSP database provides a rich source of generally consistently collected data. Several limitations of the data should be noted, however. The first is the general lack of information on household/individual income. The use of indexed average census income from 1999 for the visitor's home zip code provides a relatively weak proxy for individual income data. As can be seen below in modeling results, this proxy income variable is only marginally successful as an explanatory variable with the expected (positive) sign. The second limitation of the data is the lack of substitute behavior information. More specifically, information on what the respondent would have chosen to do or gone to if he or she were not to visit the National Park is missing. Economic theory suggests that inclusion of a substitute variable is important in model specification in order not to overstate WTP. The difficulty in identifying and constructing a working substitute variable is not unique to this study. Heberling, and Templeton as well as Bowker et al. both excluded substitute variables from their model specification for practical purposes.

The limitations led us to use an IRS Zip Code-based median income level for the respondent, to introduce potential bias in the willingness to pay values by excluding any substitution behavior, and to assume that the visit on which the individual was surveyed is typical of all visits taken by an individual to that National Park.

4.2 Yellowstone 2005 Data Model Specification

The 2005 Yellowstone NP visitor survey was specifically designed to elicit visitor WTP as one of its primary goals (the original study estimated WTP within the contingent valuation question framework). Therefore, the study has a generally richer set of explanatory variables from which to construct count data models. Many of the explanatory variables in the Yellowstone analysis were the same as in the VSP data analysis. However, the multi-season nature of the Yellowstone survey allowed for additional specification of interaction terms facilitating the estimation of per trip WTP for specific seasons as well as for primary destination and other trips.

The YNP data included information on which park entrance gate the visitor used to enter the park. This information allowed the assignment of different park zip codes for different visitors. While this type of distinction makes little sense for many small-scale NPS units, in the case of a large park such as Yellowstone correct assignment of the park entrance zip code can have significant impact on travel cost estimation. This is particularly true for visitors from nearby communities (such as Gardiner, MT or West Yellowstone, MT) who may only travel a few miles to visit the park through their nearest entrance, but could be assigned a much longer travel distance (and associated travel cost) where only one park zip code used.

Table 14 shows the variables utilized in the count data modeling of Yellowstone NP visitation. The full specification was designed to mirror the VSP data specification with the addition of season of visitation variables and interaction terms.

TABLE 14. VARIABLES USED IN THE SPECIFICATION OF THE YELLOWSTONE NP COUNT DATA VISITATION MODEL.

Variable	Definition
Park Zip	Zip code of community closest to each of the 5 YNP entrances.
Home Zip	Visitor's home zip code
Income	Individual reported family income
Mileage Rate	IRS reimbursement rate per mile (2005)
Travel Cost	(round-trip road miles x mileage rate) + \$20 entrance fee
Age	Visitor's age
Visits	No. of visits to park in 2005
Group Size	No. of individuals in visitor's group
Primary	=1 if YNP was primary destination on trip
Primary * Travel Cost	Interaction term between primary purpose trips and estimated round trip travel cost
Family	=1 if personal group was family
Multi-Day	=1 if visitor spent 1 or more days in YNP
Summer	Indicator variable = 1 if season is summer
Summer x Travel Cost	Interaction term between Summer and Travel Cost
Fall	Indicator variable = 1 if season is Fall
Fall x Travel Cost	Interaction term between Fall and Travel Cost

5.0 ANALYSIS AND RESULTS

Results are presented in two sections: for the VSP data, and for the Yellowstone NP 2005 data analyses. Additionally, sensitivity of the VSP models to alternative specification is discussed.

5.1 Visitor Services Project Data Analysis and Results

The analysis of data from 72 park surveys conducted over 15 years presented significant challenges with regards to model specification. Estimation of models for each park individually, with the associated examination of fit, and adjustment of model specification and variables included would provide the richest, yet somewhat overwhelming picture of the data and associated modeling process. This individual specification method for each park, however, would lead to some compromise in comparison of parameter estimates and associated WTP estimates between park units with differing model specifications. A second approach would be to estimate models using only variables available for the greatest number of park units. This would result in the loss of all information on the value of primary vs. secondary destination trips from the subset of surveys that collected this information.

The third, middle, approach, and the one adopted in this analysis, is to estimate two sets of models. The first uses a reduced model specification to derive WTP estimates for the largest set of park units which have consistently specified explanatory models. The second set of models is a consistent estimation of the set of 20 park surveys with primary destination information.

Appendix B shows the estimated coefficients and significance for the full set of reduced models of WTP. The set of explanatory variables used in this model set was travel cost, income, and age. As can be seen from the Appendix B results, the estimated coefficients for travel cost are generally highly significant and of the expected (-) sign. The estimated coefficients on income, however, are generally inconsistent with some parks showing a significant (+) coefficient and some a significant (-) coefficient. This result is likely a result of the previously noted limitation of the VSP data which necessitated the use of a weak proxy income variable rather than actual visitor income.

Table 15 shows the key estimated travel cost variable coefficients for the full set of 65 park units that included trips, zip code, group size, income, and age data, and which had sufficient sample sizes to allow model estimation. Estimates for four of the 72 parks were not included. Those four included Hawaiian and Alaska parks where the highway travel distance was not an appropriate approach, and individual specific air travel expenses were not reported.

TABLE 15. VSP TRAVEL COST PARAMETER FITTED MODEL RESULTS.

PARKNAME	YEAR	TRAVEL COST PARAMETER ESTIMATE	T-STAT	DF	PROB-T
Acadia National Park	2009	-0.01376	-23.54	756	0.000
Big Cypress National Preserve	2007	-0.00902	-18.45	490	0.000
Biscayne National Park	2001	-0.01425	-15.66	314	0.000
Bryce Canyon National Park	1997	-0.00816	-10.97	237	0.000
Catoctin Mountain Park	2002	-0.01252	-5.53	435	0.000
Chattahoochee River National Recreation Area	1998	-0.01928	-9.76	641	0.000
C & O Canal National Historical Park	2003	-0.00739	-10.00	591	0.000
Colonial National Historical Park (Jamestown)	2001	-0.00437	-8.34	398	0.000
Cowpens National Battlefield	2003	-0.04109	-12.71	260	0.000
Crater Lake National Park	2001	-0.00557	-10.81	410	0.000
Craters of the Moon National Monument & Preserve	2004	-0.00644	-11.49	361	0.000
Cumberland Island National Seashore	1998	-0.02375	-11.71	265	0.000
Cuyahoga Valley National Park	2005	-0.00951	-6.20	834	0.000
Dry Tortugas National Park	1995	-0.01248	-9.72	202	0.000
Dry Tortugas National Park	2002	-0.00960	-13.50	288	0.000
Ebey's Landing National Historical Reserve	2007	-0.00350	-7.04	303	0.000
Effigy Mounds National Monument	2004	-0.01407	-8.08	269	0.000
Everglades National Park	1996	-0.00619	-11.52	452	0.000
Everglades National Park	2002	-0.00918	-18.31	488	0.000
Everglades National Park	2008	-0.00897	-18.99	628	0.000
Fire Island National Seashore	2008	-0.01260	-11.41	610	0.000
Fort Donelson National Battlefield	2007	-0.01363	-7.04	253	0.000
Fort Larned National Historic Site	2009	-0.00820	-7.92	244	0.000
Fort Stanwix NM	2003	-0.00376	-3.47	192	0.001
Fort Sumter National Monument	2005	-0.01060	-9.43	354	0.000
Gateway National Recreation Area - Floyd Bennett Field Visitor Study	2003	-0.00642	-3.05	369	0.002
George Washington Birthplace National Monument	2004	-0.01393	-5.79	179	0.000
Glen Canyon National Recreation Area	2007	-0.01396	-17.07	514	0.000
Golden Spike National Historic Site	2006	-0.00575	-8.67	239	0.000
Great Sand Dunes National Monument & Preserve	2002	-0.01154	-12.02	327	0.000
Great Smoky Mountains National Park	1996	-0.02504	-27.72	1654	0.000
Hopewell Furnace National Historic Site	2002	-0.00676	-3.81	225	0.000
Homestead National Monument of America	2009	-0.00765	-6.97	234	0.000
Independence National Historical Park	2007	-0.00606	-13.34	714	0.000
Indiana Dunes National Lakeshore	2009	-0.02001	-9.33	486	0.000
Jean Lafitte National Historical Park & Preserve	1998	-0.01066	-18.19	435	0.000
Johnstown Flood National Memorial	2005	-0.00466	-3.16	211	0.002
Kings Mountain National Military Park	2006	-0.01043	-6.73	216	0.000
Klondike Gold Rush National Historic Site	2009	-0.01133	-8.34	194	0.000
Knife River Indian Village NHS	2003	-0.00914	-10.22	239	0.000

PARKNAME	YEAR	TRAVEL COST PARAMETER ESTIMATE	T-STAT	DF	PROB-T
Lincoln Boyhood Home National Memorial	1997	-0.00530	-4.56	382	0.000
Lincoln Home National Historic Site	2005	-0.01570	-10.80	412	0.000
Lowell National Historical Park	1997	-0.00832	-9.72	375	0.000
Mount Rainier National Park	2000	-0.00526	-15.58	706	0.000
Mount Rushmore National Memorial	2007	-0.01259	-19.56	555	0.000
Iwo Jima/Netherlands Carillon Memorials	1998	-0.01576	-20.52	495	0.000
New River Gorge National River	2004	-0.01938	-11.86	483	0.000
Olympic National Park	2000	-0.00657	-19.70	788	0.000
Pinnacles National Monument	2002	-0.00743	-5.45	356	0.000
Pictured Rocks National Lakeshore	2001	-0.02198	-16.26	456	0.000
Rainbow Bridge National Monument	2007	-0.00379	-5.05	214	0.000
San Antonio Missions National Historical Park	1994	-0.01855	-18.19	344	0.000
San Francisco Maritime National Historical Park	1995	-0.00479	-11.05	436	0.000
San Francisco Maritime National Historical Park	2005	-0.00549	-13.64	355	0.000
Saint-Gaudens National Historic Site	2004	-0.00308	-3.68	247	0.000
Sequoia & Kings Canyon National Parks and Sequoia National Forest	2001	-0.00810	-14.81	462	0.000
Shenandoah National Park	2001	-0.01406	-13.32	593	0.000
Sleeping Bear Dunes National Lakeshore	2009	-0.01522	-16.30	673	0.000
Stones River National Battlefield	2002	-0.01462	-10.57	260	0.000
USS Arizona Memorial	2000	-0.00374	-18.42	342	0.000
Voyageurs National Park	1997	-0.01131	-15.22	645	0.000
Yellowstone National Park	2006	-0.00786	-17.63	739	0.000
Yosemite National Park	2005	-0.00655	-15.66	609	0.000
Yosemite National Park	2008	-0.00935	-10.67	474	0.000
Yosemite National Park	2009	-0.00746	-15.89	497	0.000

Table 16 shows estimated NEV per trip for the parks in the VSP dataset with adequate data for estimation. These estimates are based on use of the IRS charity mileage rate (12 to 14 cents per mile), and the conservative assumption that those visitors not answering the question on number of trips taken took only one trip in the previous 12 months

TABLE 16. VSP DATA NET ECONOMIC VALUE PER TRIP ESTIMATES.

PARK	PARKNAME	TYPE	REGION	YEAR	NEV/ PERSON / TRIP
ACAD	Acadia National Park	NP	NER	2009	\$ 72.70
BICY	Big Cypress National Preserve	NP&PRES	SER	2007	\$ 110.92
BISC	Biscayne National Park	NP	SER	2001	\$ 70.17
BRCA	Bryce Canyon National Park	NP	IMR	1997	\$ 122.58
CATO	Catoctin Mountain Park	OTHER	NCR	2002	\$ 79.90
CHAT	Chattahoochee River National Recreation Area	NRA	SER	1998	\$ 51.87
CHOH	C & O Canal National Historical Park	NHP	NCR	2003	\$ 135.27
COLO	Colonial National Historical Park (Jamestown)	NHP	NER	2001	\$ 228.81
COWP	Cowpens National Battlefield	NB	SER	2003	\$ 24.34
CRLA	Crater Lake National Park	NP	PWR	2001	\$ 179.61
CRMO	Craters of the Moon National Monument & Preserve	NM	PWR	2004	\$ 155.37
CUIS	Cumberland Island National Seashore	NS	SER	1998	\$ 42.10
CUVA	Cuyahoga Valley National Park	NP	MWR	2005	\$ 105.10
DRTO	Dry Tortugas National Park	NP	SER	1995	\$ 80.13
DRTO	Dry Tortugas National Park	NP	SER	2002	\$ 104.21
EBLA	Ebey's Landing National Historical Reserve	OTHER	PWR	2007	\$ 285.87
EFMO	Effigy Mounds National Monument	NM	MWR	2004	\$ 71.08
EVER	Everglades National Park	NP	SER	1996	\$ 161.43
EVER	Everglades National Park	NP	SER	2002	\$ 108.95
EVER	Everglades National Park	NP	SER	2008	\$ 111.50
FIIS	Fire Island National Seashore	NS	NER	2008	\$ 79.34
FODO	Fort Donelson National Battlefield	NB	SER	2007	\$ 73.35
FOLS	Fort Larned National Historic Site	NHS	MWR	2009	\$ 121.97
FOST	Fort Stanwix NM	NM	NER	2003	\$ 266.25
FOSU	Fort Sumter National Monument	NM	SER	2005	\$ 94.36
GATE	Gateway National Recreation Area - Floyd Bennett Field Visitor Study	NRA	NER	2003	\$ 155.87
GEWA	George Washington Birthplace National Monument	NM	NER	2004	\$ 71.77
GLCA	Glen Canyon National Recreation Area	NRA	IMR	2007	\$ 71.61
GOSP	Golden Spike National Historic Site	NHS	IMR	2006	\$ 173.89
GRSA	Great Sand Dunes National Monument & Preserve	NM	IMR	2002	\$ 86.67
GRSM	Great Smoky Mountains National Park	NP	SER	1996	\$ 39.93
HOFU	Hopewell Furnace National Historic Site	NHS	NER	2002	\$ 147.97
HOME	Homestead National Monument of America	NM	MWR	2009	\$ 130.68
INDE	Independence National Historical Park	NHP	NER	2007	\$ 164.88
INDU	Indiana Dunes National Lakeshore	NL	MWR	2009	\$ 49.97
JELA	Jean Lafitte National Historical Park & Preserve	OTHER	SER	1998	\$ 93.78
JOFL	Johnstown Flood National Memorial	NMEM	NER	2005	\$ 214.37
KIMO	Kings Mountain National Military Park	NMP	SER	2006	\$ 95.89
KLSE	Klondike Gold Rush National Historic Site	NHS	PWR	2009	\$ 88.29
KNRI	Knife River Indian Village NHS	NHS	MWR	2003	\$ 109.46
LIBO	Lincoln Boyhood Home National Memorial	NMEM	MWR	1997	\$ 188.67

PARK	PARKNAME	TYPE	REGION	YEAR	NEV/ PERSON / TRIP
LIHO	Lincoln Home National Historic Site	NHS	MWR	2005	\$ 63.69
LOWE	Lowell National Historical Park	NHP	NER	1997	\$ 120.23
MANZ	Manzanar National Historic Site	NHS	PWR	2004	\$ 190.23
MORA	Mount Rainier National Park	NP	PWR	2000	\$ 79.40
MORU	Mount Rushmore National Memorial	NMEM	MWR	2007	\$ 63.44
NECA	Iwo Jima/Netherlands Carillon Memorials	MEM	NCR	1998	\$ 51.59
NERI	New River Gorge National River	NR	NER	2004	\$ 152.11
OLYM	Olympic National Park	NP	PWR	2000	\$ 134.57
PINN	Pinnacles National Monument	NM	PWR	2002	\$ 45.49
PIRO	Pictured Rocks National Lakeshore	NL	MWR	2001	\$ 264.09
SAAN	San Antonio Missions National Historical Park	NHP	IMR	1994	\$ 53.91
SAFR	San Francisco Maritime National Historical Park	NHP	PWR	1995	\$ 208.85
SAFR	San Francisco Maritime National Historical Park	NHP	PWR	2005	\$ 182.00
SAGA	Saint-Gaudens National Historic Site	NHS	NER	2004	\$ 325.18
SEKI	Sequoia & Kings Canyon National Parks and Sequoia National Forest	NP	PWR	2001	\$ 123.44
SHEN	Shenandoah National Park	NP	NER	2001	\$ 71.13
SLBE	Sleeping Bear Dunes National Lakeshore	NL	MWR	2009	\$ 65.71
STRI	Stones River National Battlefield	NB	SER	2002	\$ 68.38
USAR	USS Arizona Memorial	MEM	PWR	2000	\$ 267.57
VOYA	Voyageurs National Park	NP	MWR	1997	\$ 88.41
YELL	Yellowstone National Park	NP	IMR	2006	\$ 127.17
YOSE	Yosemite National Park	NP	PWR	2005	\$ 152.72
YOSE	Yosemite National Park	NP	PWR	2008	\$ 106.96
YOSE	Yosemite National Park	NP	PWR	2009	\$ 134.08

Table 17 shows the estimated models for the subset of park units with information on whether the visitors were on a primary purpose trip. The full model specifications and results for this set of parks are included in Appendix B. Several park units returned insignificant parameter estimates for the specification including primary purpose interaction terms.

TABLE 17. ESTIMATED VSP COUNT DATA MODEL TRAVEL COST AND INTERACTION PARAMETERS: PARKS WITH PRIMARY PURPOSE INFORMATION.

PARKNAME	YEAR	VARIABLE	COEFFICIENT	T-STAT	DF	PROBT
C & O Canal National Historical Park	2003	TC	-0.00921	-9.63	578	0.0000
C & O Canal National Historical Park	2003	Primary * TC	0.00480	3.06	578	0.0023
Ebey's Landing National Historical Reserve	2007	TC	-0.00245	-4.64	288	0.0000
Ebey's Landing National Historical Reserve	2007	Primary * TC	-0.00807	-2.62	288	0.0093
Effigy Mounds National Monument	2004	TC	-0.01025	-6.23	267	0.0000
Effigy Mounds National Monument	2004	Primary * TC	-0.05536	-4.27	267	0.0000
Fort Donelson Nat. Battlefield	2007	TC	-0.01040	-5.56	253	0.0000
Fort Donelson Nat. Battlefield	2007	Primary * TC	-0.02207	-3.26	253	0.0013
Fort Larned National Historic Site	2009	TC	-0.00639	-5.56	244	0.0000
Fort Larned National Historic Site	2009	Primary * TC	-0.00366	-0.93*	244	0.3529
Great Sand Dunes National Monument & Preserve	2002	TC	-0.01008	-9.88	325	0.0000
Great Sand Dunes National Monument & Preserve	2002	Primary * TC	-0.00725	-1.82	325	0.0702
Great Smokey Mtns. National Park	1996	TC	-0.02175	-14.82	1654	0.0000
Great Smokey Mtns. National Park	1996	Primary * TC	-0.00465	-2.52	1654	0.0120
Hopewell Furnace National Historic Site	2002	TC	-0.00566	-2.91	222	0.0040
Hopewell Furnace National Historic Site	2002	Primary * TC	-0.00110	-0.27*	222	0.7837
Independence National Historical Park	2007	TC	-0.00601	-11.37	705	0.0000
Independence National Historical Park	2007	Primary * TC	-0.00008	-0.08*	705	0.9357
Kings Mountain National Military Park	2006	TC	-0.00790	-4.81	214	0.0000
Kings Mountain National Military Park	2006	Primary * TC	-0.00169	-0.42*	214	0.6742
Knife River Indian Village NHS	2003	TC	-0.00918	-9.57	237	0.0000
Knife River Indian Village NHS	2003	Primary * TC	-0.00865	-1.13*	237	0.2592
Lincoln Boyhood Home National Memorial	1997	TC	-0.00285	-2.41	381	0.0164
Lincoln Boyhood Home National Memorial	1997	Primary * TC	-0.03634	-2.33	381	0.0202
Lowell National Historical Park	1997	TC	-0.00544	-6.05	367	0.0000
Lowell National Historical Park	1997	Primary * TC	-0.00813	-2.70	367	0.0073
Mount Rushmore National Memorial	2007	TC	-0.01261	-18.37	551	0.0000
Mount Rushmore National Memorial	2007	Primary * TC	0.00007	0.03*	551	0.9725
New River Gorge National River	2004	TC	-0.01213	-6.78	477	0.0000
New River Gorge National River	2004	Primary * TC	-0.01167	-3.58	477	0.0004
Pictured Rocks National Lakeshore	2001	TC	-0.01213	-9.31	449	0.0000
Pictured Rocks National Lakeshore	2001	Primary * TC	-0.04268	-9.47	449	0.0000
Shenandoah National Park	2001	TC	-0.00846	-8.33	583	0.0000
Shenandoah National Park	2001	Primary * TC	-0.02840	-7.28	583	0.0000
Stones River National Battlefield	2002	TC	-0.00759	-5.80	250	0.0000
Stones River National Battlefield	2002	Primary * TC	-0.01616	-3.12	250	0.0020

NOTE:* Shaded Units are not statistically significant at the 95% level

TABLE 18. ESTIMATED PER TRIP WTP ESTIMATE FOR MODELS OF PARK VISITATION WITH PRIMARY PURPOSE INTERACTION TERMS.

PARK	PARKNAME	TYPE	REGION	YEAR	PRIMARY PURPOSE NEV/Trip	SECONDARY PURPOSE NEV/Trip
CHOH	C & O Canal National Historical Park	NHP	NCR	2003	\$ 226.67	\$ 108.54
EBLA	Ebey's Landing National Historical Reserve	OTHER	PWR	2007	\$ 95.00	\$ 407.82
EFMO	Effigy Mounds National Monument	NM	MWR	2004	\$ 15.24	\$ 97.56
FODO	Fort Donelson Nat. Battlefield	NB	SER	2007	\$ 30.79	\$ 96.11
FOLS	Fort Larned National Historic Site	NHS	MWR	2009	Not significant	\$ 156.55
GRSA	Great Sand Dunes National Monument & Preserve	NM	IMR	2002	\$ 57.69	\$ 99.16
GRSM	Great Smokey Mtns. National Park	NP	SER	1996	\$ 37.88	\$ 45.97
HOFU	Hopewell Furnace National Historic Site	NHS	NER	2002	Not significant	\$ 176.65
INDE	Independence National Historical Park	NHP	NER	2007	Not significant	\$ 166.28
KIMO	Kings Mountain National Military Park	NMP	SER	2006	Not significant	\$ 126.63
KNRI	Knife River Indian Village NHS	NHS	MWR	2003	Not significant	\$ 108.96
LIBO	Lincoln Boyhood Home National Memorial	NMEM	MWR	1997	\$ 25.52	\$ 351.43
LOWE	Lowell National Historical Park	NHP	NER	1997	\$ 73.67	\$ 183.73
MORU	Mount Rushmore National Memorial	NMEM	MWR	2007	Not significant	\$ 79.33
NERI	New River Gorge National River	NR	NER	2004	\$ 42.02	\$ 82.46
PIRO	Pictured Rocks National Lakeshore	NL	MWR	2001	\$ 18.24	\$ 82.44
SHEN	Shenandoah National Park	NP	NER	2001	\$ 27.13	\$ 118.26
STRI	Stones River National Battlefield	NB	SER	2002	\$ 42.11	\$ 131.77

* estimates in shaded cells are not reported as they would be based on non-significant parameters

5.1.1 Sensitivity of VSP Modeling to Model Specification

As discussed above, several methodological, model specification and data coding choices were inevitably necessary in the estimation of the travel cost models of WTP for visits to park units included in the VSP data set. One key decision lies in the choice of a per-mile rate at which to value distance traveled in the construction of the travel cost parameter. The primary results reported here utilize the IRS Charity deduction rate of 12 to 14 cents per mile (depending on the survey year). This choice is conservative, and consistent with the most conservative travel cost assumptions employed by Bowker et al. (2009). Heberling and Templeton (2009) used the full IRS private vehicle deduction rate per mile. This rate is roughly 2-3 times the charity rate, depending on the year. The sensitivity of the estimated WTP per trip values to choice of a mileage value rate is reflected generally proportionally in the comparison of the reported WTP values in this section, and those reported in the sensitivity results in Appendix C.

A second important modeling choice was the use of a consistent, but reduced, model specification. Table 19 shows a comparison of estimated models and resulting WTP estimates for two VSP park surveys, Independence NP and Shenandoah NP. These parks were chosen for the comparison because they had some of the largest sample sizes and preliminary estimates showed that the maximum likelihood models readily converged and yielded consistently significant parameters.

The Table 19 results show the models and estimated key parameters are generally quite stable from specification to specification. These results support the decision to utilize a consistent reduced specification across all park units estimated.

TABLE 19. SENSITIVITY ANALYSIS OF MODEL SPECIFICATION: INDEPENDENCE AND SHENANDOAH NATIONAL PARKS.

Independence NP	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate	T-STAT	Estimate	T-STAT	Estimate	T-STAT	Estimate	T-STAT	Estimate	T-STAT
	CONSTANT	1.65463	9.12	1.62964	9.02	1.40426	7.81514	1.08316	8.30	0.99960
TC	-0.00139	-11.01	-0.00140	-11.17	-0.00145	-11.27076	-0.00149	-11.62	-0.00148	-11.59
INCOME	0.00102	0.07	0.00098	0.07	-0.00758	-0.53164	-0.01207	-0.85		
AGE	-0.00749	-2.43	-0.00742	-2.41	-0.00777	-2.49287				
FAMILY	-0.37066	-4.59	-0.37176	-4.60						
MULTIDAY	-0.08977	-1.10								
alpha	0.77519	6.58	0.77836	6.56	0.86426	6.40893	0.88690	6.36	0.891200	6.35
Sample Size	456		456		456		456		456	

Shenandoah NP	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate	T-STAT	Estimate	T-STAT	Estimate	T-STAT	Estimate	T-STAT	Estimate	T-STAT
	CONSTANT	-0.87992	-0.26	-1.25344	-0.27	-1.60371	-	-1.69727	-0.43	-6.78240
TC	-0.00567	-10.37	-0.00572	-10.45	-0.00574	-11.82616	-0.00578	-10.82	-0.00571	-10.93
INCOME	-0.11605	-4.83	-0.11880	-4.96	-0.12049	-5.07707	-0.11961	-5.05		
AGE	-0.00306	-0.65	-0.00235	-0.50	-0.00232	-0.49342				
FAMILY	-0.15525	-1.33	-0.12138	-1.06						
MULTIDAY	-0.26146	-1.59								
alpha	55.56926	0.29	75.93828	0.21	100.318	-	99.08961	0.25	8,472.92000	1.16E+09
Sample Size	574		574		574		574		574	

5.1.2 Comparison of Current Results to Heberling and Templeton Results

The current analysis made some key methodological choices that differed from those used by Heberling and Templeton. However, since one of the parks (and associated data sets) examined in this study (Great Sand Dunes National Monument) is the same as that upon which Heberling and Templeton did their analysis, an attempt was made to replicate their results to the extent possible. Heberling included several explanatory variables in their analysis that were not included in this study. These variables were a dummy variable indicating whether respondent visited another national park on their trip, a dummy for hiking or horseback riding, and a dummy for whether the visitor was aware of the park before coming. Additionally, the estimation of mileage differed between the two studies, Heberling using a great circle algorithm and the current study using actual road mileage.

Table 20 shows a comparison of the current study and Heberling's results for the Great Sand Dunes NM visitor data. For this comparison, this study used the same IRS rate as did the Heberling study. The Heberling study had one fewer observation than the current analysis, owing to the inclusion of additional covariates, and an assumed missing value. Besides these differences, the measurement of travel distance, and the parameterization of primary and non-primary trips differed in the studies (Heberling trichotomized the primary purpose variable, while the current study dichotomized the variable). As the table shows, however, the results of the two models are very close. The means for the dependent trips variable and the key travel cost variables are within 1 to 2 %, and the estimated consumer surplus per trips compare well given differences in model specification. Current study estimated WTP values are marginally lower than the Heberling estimates, but the ratio between primary destination and non-primary destination trip values in the current study mirrors the ratio found by Heberling and Templeton. The remaining differences in the estimates are likely due to the way travel distances are calculated.

TABLE 20. COMPARISON OF CURRENT STUDY AND HEBERLING AND TEMPLETON RESULTS USING CONSISTENT SAMPLES AND TRAVEL COSTS.

Variable / Statistic	Heberling and Templeton	Current Study
Mean Person Trips	5.32	5.28
Mean Travel Cost	\$195	\$197
Sample	314	315
CS / person trip (primary destination)	\$152	\$144
CS / person trip (secondary destination)	\$291	n/a
CS / person trip (unplanned destination)	\$304	n/a
CS / person trip (non-primary destination)	n/a	\$271

5.2 Yellowstone NP Study Data Analysis and Results

The 2006 Yellowstone NP survey data was parameterized and coded in a consistent manner with the VSP data reported above. Table 21 and Table 22 show the estimated model parameters and t-statistics, and estimated WTP per trip, respectively. The data analyzed was for three park seasons (Spring, Summer, and Fall) and was pooled.

The estimated model included interaction terms with travel cost for Summer season visitor, Fall season visitors, and visitors for whom Yellowstone was the primary destination of their trip. An analysis of the Table 21 model without the income variable showed nearly identical estimates for the key travel cost parameter, indicating that the model results are quite stable across specifications.

TABLE 21. YELLOWSTONE NP 2006 STUDY DATA, ESTIMATED TRAVEL COST MODEL OF WILLINGNESS TO PAY.

Parameter	Zero-Truncated Negative Binomial w/ Endogenous Stratification Model	
	Estimate	t-stat
CONSTANT	1.2972	3.53
TRAVEL COST	-0.0101	-14.19
INCOME	0.0296	2.88
AGE	-0.0007	-0.23
FAMILY	-0.3767	-4.35
MULTI DAY	-0.2418	-2.71
SUMMER	-0.6700	-5.21
FALL	-0.8157	-5.44
SUMMER * TC	0.0030	4.24
FALL * TC	0.0024	2.97
MAINDEST	-0.1189	-0.96
MAINDEST * TC	0.0028	4.26
ALPHA	4.4530	2.76
Sample	919	

TABLE 22. ESTIMATED WTP PER TRIP, YELLOWSTONE SURVEY DATA.

Season / Primary	NEV / person trip	
Yellowstone was primary destination		
Spring	\$	136.97
Summer	\$	231.96
Fall	\$	204.16
Yellowstone was a secondary destination		
Spring	\$	99.30
Summer	\$	141.24
Fall	\$	130.43

5.2.1 Comparison of Yellowstone NP Visitor Survey Travel Cost Models and Estimates

Two independent high-quality surveys of Yellowstone NP visitors completed in 2005 and 2006 include the necessary survey questions and associated data to estimate count-data-based travel cost models of WTP for visits to the park. Table 23 shows the two surveys and their respective years, samples, TC parameters, and implied NEV per trips. To maximize consistency of the estimates both models were estimated for Summer season visits, and utilized a 14 cent per mile IRS charity mileage rate in constructing the travel cost variable.

As the table shows, the estimates are relatively comparable with much of the variation in 2009 WTP resulting from the CPI index used.

TABLE 23. COMPARISON OF INDEPENDENT YELLOWSTONE NP MODELS OF COUNT-DATA WTP.

Survey	Year	Sample Size	TC parameter*	NEV /trip	2009 CPI index	NEV/trip 2009
VSP Park Survey	2006	704	-0.00786	\$ 127	1.064	\$ 135
YNP Survey	2005	919	-0.00570	\$ 175	1.098	\$ 193

* All Travel Cost parameters are significant at the 99% level of confidence.

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APPENDIX A: VISITOR SERVICES PROJECT DATA INCLUDED IN ANALYSIS

TABLE 24. DATA SET PARK DESCRIPTIVE INFORMATION: A

SURVEY YEAR	CODE	SURVEY #	PARK NAME	RESPONSE RATE	STATE
1994	SAAN	65	San Antonio Missions National Historical Park	74.67%	TX
1995	SAFR	82	San Francisco Maritime National Historical Park	70.06%	CA
1995	DRTO	83	Dry Tortugas National Park	77.16%	FL
1996	EVER	84	Everglades National Park	80.58%	FL
1996	GRSM	88	Great Smoky Mountains National Park	77.16%	NC
1996	GRSM	92	Great Smoky Mountains National Park	81.61%	NC
1997	LIBO	96	Lincoln Boyhood Home National Memorial	79.81%	IN
1997	BRCA	98	Bryce Canyon National Park	80.57%	UT
1997	VOYA	99	Voyageurs National Park	80.13%	MO
1997	LOWE	100	Lowell National Historical Park	84.11%	MA
1998	JELA	101	Jean Lafitte National Historical Park & Preserve	72.32%	LA
1998	CHAT	102	Chattahoochee River National Recreation Area	71.18%	GA
1998	CUIS	103	Cumberland Island National Seashore	85.76%	GA
1998	NECA	104	Iwo Jima/Netherlands Carillon Memorials	71.20%	VA
2000	HALE	118.1	Haleakala National Park (Summit)		HI
2000	HALE	118.2	Haleakala National Park (Kipahulu)		HI
2000	USAR	120	USS Arizona Memorial	66.86%	HI
2000	OLYM	121	Olympic National Park	78.05%	WA
2000	MORA	124	Mount Rainier National Park	75.74%	WA
2001	BISC	125	Biscayne National Park	62.81%	FL
2001	COLO	126	Colonial National Historical Park (Jamestown)	79.17%	VA
2001	SHEN	127	Shenandoah National Park	76.78%	VA
2001	PIRO	128	Pictured Rocks National Lakeshore	82.25%	MI
2001	CRLA	129	Crater Lake National Park	80.67%	OR
2002	EVER	131	Everglades National Park	77.49%	FL
2002	DRTO	132	Dry Tortugas National Park	77.75%	FL
2002	PINN	133	Pinnacles National Monument	77.10%	CA
2002	GRSA	134	Great Sand Dunes National Monumnet & Preserve	75.99%	CO
2002	SEKI	137	Sequoia & Kings Canyon National Parks and Sequoia National Forest	68.60%	CA
2002	CATO	138	Catoctin Mountain Park	77.81%	MD
2002	HOFU	139	Hopewell Furnace National Historic Site	78.50%	PA
2002	STRI	140	Stones River National Battlefield	81.18%	TN
2003	GATE	141	Gateway National Recreation Area - Floyd Bennett Field Visitor Study	57.41%	NJ
2003	COWP	142	Cowpens National Battlefield	77.58%	SC
2003	CHOH	145	C & O Canal National Historical Park	67.76%	DC
2003	KNRI	148	Knife River Indian Village NHS	86.54%	ND
2003	FOST	149	Fort Stanwix NM	68.14%	NY
2004	NERI	153	New River Gorge National River	65.79%	WV
2004	GEWA	154	George Washington Birthplace National Monument	63.14%	VA

SURVEY YEAR	CODE	SURVEY #	PARK NAME	RESPONSE RATE	STATE
2004	CRMO	155	Craters of the Moon National Monument & Preserve	83.20%	ID
2004	EFMO	159	Effigy Mounds National Monument	77.11%	IA
2004	SAGA	160	Saint-Gaudens National Historic Site	82.37%	NH
2004	MANZ	161	Manzanar National Historic Site	76.67%	CA
2005	SAFR	164	San Francisco Maritime National Historical Park	57.88%	CA
2005	LIHO	165	Lincoln Home National Historic Site	71.08%	IL
2005	CHIC	166	Chickasaw National Recreation Area	53.79%	OK
2005	YOSE	168	Yosemite National Park	64.87%	CA
2005	FOSU	169	Fort Sumter National Monument	63.97%	SC
2005	CUVA	171	Cuyahoga Valley National Park	76.18%	OH
2005	JOFL	172	Johnstown Flood National Memorial	74.84%	PA
2006	KIMO	174	Kings Mountain National Military Park	66.47%	SC
2006	JOFI	175	John F. Kennedy National Historic Site	66.81%	MA
2006	YELL	178	Yellowstone National Park	69.35%	WY
2006	GOSP	181	Golden Spike National Historic Site	77.65%	UT
2006	KATM	182	Katmai National Park & Preserve	74.34%	AK
2007	BICY	184.1	Big Cypress National Preserve	63.27%	FL
2007	GLCA	186.2	Glen Canyon National Recreation Area	56.92%	AZ
2007	FODO	190	Fort Donelson National Battlefield	64.84%	KY
2007	MORU	192	Mount Rushmore National Memorial	66.16%	SD
2007	EBLA	193	Ebey's Landing National Historical Reserve	67.16%	WA
2007	RABR	194	Rainbow Bridge National Monument	64.94%	UT
2007	INDE	195	Independence National Historical Park	53.35%	PA
2008	YOSE	198	Yosemite National Park	60.02%	CA
2008	EVER	199.1	Everglades National Park	72.67%	FL
2008	FIIS	203	Fire Island National Seashore	56.04%	NY
2009	FOLS	209	Fort Larned National Historic Site	76.76%	KS
2009	HOME	210	Homestead National Monument of America	74.71%	NE
2009	KLSE	214	Klondike Gold Rush National Historic Site	64.90%	WA
2009	YOSE	215	Yosemite National Park	56.52%	CA
2009	SLBE	216	Sleeping Bear Dunes National Lakeshore	60.10%	MI
2009	INDU	220	Indiana Dunes National Lakeshore	54.96%	IN
2009	ACAD	221	Acadia National Park	73.79%	ME

TABLE 25. DATA SET PARK DESCRIPTIVE INFORMATION: B

PARK NAME	SAMPLE SIZE	REGION	STATE	TYPE
San Antonio Missions National Historical Park	401	IMR	TX	NHP
San Francisco Maritime National Historical Park	578	PWR	CA	NHP
Dry Tortugas National Park	223	SER	FL	NP
Everglades National Park	635	SER	FL	NP
Great Smoky Mountains National Park	919	SER	NC	NP
Great Smoky Mountains National Park	945	SER	NC	NP
Lincoln Boyhood Home National Memorial	415	MWR	IN	NMEM
Bryce Canyon National Park	427	IMR	UT	NP
Voyageurs National Park	718	MWR	MO	NP
Lowell National Historical Park	471	NER	MA	NHP
Jean Lafitte National Historical Park & Preserve	554	SER	LA	OTHER
Chattahoochee River National Recreation Area	704	SER	GA	NRA
Cumberland Island National Seashore	295	SER	GA	NS
Iwo Jima/Netherlands Carillon Memorials	576	NCR	VA	MEM
Haleakala National Park (Summit)	362	PWR	HI	NP
Haleakala National Park (Kipahulu)	239	PWR	HI	NP
USS Arizona Memorial	468	PWR	HI	MEM
Olympic National Park	928	PWR	WA	NP
Mount Rainier National Park	790	PWR	WA	NP
Biscayne National Park	380	SER	FL	NP
Colonial National Historical Park (Jamestown)	475	NER	VA	NHP
Shenandoah National Park	691	NER	VA	NP
Pictured Rocks National Lakeshore	505	MWR	MI	NL
Crater Lake National Park	484	PWR	OR	NP
Everglades National Park	623	SER	FL	NP
Dry Tortugas National Park	311	SER	FL	NP
Pinnacles National Monument	394	PWR	CA	NM
Great Sand Dunes National Monumnet & Preserve	364	IMR	CO	NM
Sequoia & Kings Canyon National Parks and Sequoia National Forest	555	PWR	CA	NP
Catoctin Mountain Park	470	NCR	MD	OTHER
Hopewell Furnace National Historic Site	252	NER	PA	NHS
Stones River National Battlefield	289	SER	TN	NB
Gateway National Recreation Area - Floyd Bennett Field Visitor Study	492	NER	NJ	NRA
Cowpens National Battlefield	301	SER	SC	NB
C & O Canal National Historical Park	662	NCR	DC	NHP
Knife River Indian Village NHS	270	MWR	ND	NHS
Fort Stanwix NM	216	NER	NY	NM
New River Gorge National River	552	NER	WV	NR
George Washington Birthplace National Monument	197	NER	VA	NM
Craters of the Moon National Monument & Preserve	426	PWR	ID	NM
Effigy Mounds National Monument	293	MWR	IA	NM
Saint-Gaudens National Historic Site	285	NER	NH	NHS

PARK NAME	SAMPLE SIZE	REGION	STATE	TYPE
Manzanar National Historic Site	276	PWR	CA	NHS
San Francisco Maritime National Historical Park	492	PWR	CA	NHP
Lincoln Home National Historic Site	462	MWR	IL	NHS
Chickasaw National Recreation Area	475	IMR	OK	NRA
Yosemite National Park	781	PWR	CA	NP
Fort Sumter National Monument	380	SER	SC	NM
Cuyahoga Valley National Park	905	MWR	OH	NP
Johnstown Flood National Memorial	232	NER	PA	NMEM
Kings Mountain National Military Park	228	SER	SC	NMP
John F. Kennedy National Historic Site	316	NER	MA	NHS
Yellowstone National Park	903	IMR	WY	NP
Golden Spike National Historic Site	264	IMR	UT	NHS
Katmai National Park & Preserve	507	ALR	AK	NP
Big Cypress National Preserve	634	SER	FL	NP&PRES
Glen Canyon National Recreation Area	679	IMR	AZ	NRA
Fort Donelson National Battlefield	284	SER	KY	NB
Mount Rushmore National Memorial	647	MWR	SD	NMEM
Ebey's Landing National Historical Reserve	362	PWR	WA	OTHER
Rainbow Bridge National Monument	250	IMR	UT	NM
Independence National Historical Park	805	NER	PA	NHP
Yosemite National Park	563	PWR	CA	NP
Everglades National Park	795	SER	FL	NP
Fire Island National Seashore	636	NER	NY	NS
Fort Larned National Historic Site	261	MWR	KS	NHS
Homestead National Monument of America	254	MWR	NE	NM
Klondike Gold Rush National Historic Site	220	PWR	WA	NHS
Yosemite National Park	689	PWR	CA	NP
Sleeping Bear Dunes National Lakeshore	696	MWR	MI	NL
Indiana Dunes National Lakeshore	499	MWR	IN	NL
Acadia National Park	856	NER	ME	NP

TABLE 26. DATA SET PARK DESCRIPTIVE INFORMATION: C

PARK NAME	STATE	TYPE	PER GROUP/VEHICLE ENTRANCE FEE	PER PERSON ENTRANCE FEE
San Antonio Missions National Historical Park	TX	NHP	0	0
San Francisco Maritime National Historical Park	CA	NHP	none	5
Dry Tortugas National Park	FL	NP	none	7
Everglades National Park	FL	NP	10	none
Great Smoky Mountains National Park	NC	NP	0	0
Great Smoky Mountains National Park	NC	NP	0	0
Lincoln Boyhood Home National Memorial	IN	NMEM	5	3
Bryce Canyon National Park	UT	NP	25	12
Voyageurs National Park	MO	NP	0	0
Lowell National Historical Park	MA	NHP	0	0
Jean Lafitte National Historical Park & Preserve	LA	OTHER	0	0
Chattahoochee River National Recreation Area	GA	NRA	3	none
Cumberland Island National Seashore	GA	NS	none	17
Iwo Jima/Netherlands Carillon Memorials	VA	MEM	5	3
Haleakala National Park (Summit)	HI	NP	10	5
Haleakala National Park (Kipahulu)	HI	NP	10	5
USS Arizona Memorial	HI	MEM	0	0
Olympic National Park	WA	NP	15	5
Mount Rainier National Park	WA	NP	15	5
Biscayne National Park	FL	NP	30	15
Colonial National Historical Park (Jamestown)	VA	NHP	none	10
Shenandoah National Park	VA	NP	15	8
Pictured Rocks National Lakeshore	MI	NL	0	0
Crater Lake National Park	OR	NP	10	none
Everglades National Park	FL	NP	10	none
Dry Tortugas National Park	FL	NP	none	7
Pinnacles National Monument	CA	NM	5	3
Great Sand Dunes National Monumnet & Preserve	CO	NM	none	3
Sequoia & Kings Canyon National Parks and Sequoia National Forest	CA	NP	10	none
Catoctin Mountain Park	MD	OTHER	0	0
Hopewell Furnace National Historic Site	PA	NHS	0	0
Stones River National Battlefield	TN	NB	0	0
Gateway National Recreation Area - Floyd Bennett Field Visitor Study	NJ	NRA	0	0
Cowpens National Battlefield	SC	NB	0	0
C & O Canal National Historical Park	DC	NHP	5	3
Knife River Indian Village NHS	ND	NHS	0	0
Fort Stanwix NM	NY	NM	0	0
New River Gorge National River	WV	NR	0	0
George Washington Birthplace National Monument	VA	NM	none	4
Craters of the Moon National Monument & Preserve	ID	NM	8	4
Effigy Mounds National Monument	IA	NM	none	3
Saint-Gaudens National Historic Site	NH	NHS	none	5

PARK NAME	STATE	TYPE	PER GROUP/VEHICLE ENTRANCE FEE	PER PERSON ENTRANCE FEE
Manzanar National Historic Site	CA	NHS	0	0
San Francisco Maritime National Historical Park	CA	NHP	none	5
Lincoln Home National Historic Site	IL	NHS	0	0
Chickasaw National Recreation Area	OK	NRA	0	0
Yosemite National Park	CA	NP	20	10
Fort Sumter National Monument	SC	NM	0	0
Cuyahoga Valley National Park	OH	NP	0	0
Johnstown Flood National Memorial	PA	NMEM	none	4
Kings Mountain National Military Park	SC	NMP	0	0
John F. Kennedy National Historic Site	MA	NHS	none	3
Yellowstone National Park	WY	NP	25	12
Golden Spike National Historic Site	UT	NHS	7	4
Katmai National Park & Preserve	AK	NP	0	0
Big Cypress National Preserve	FL	NP&PRES	0	0
Glen Canyon National Recreation Area	AZ	NRA	15	7
Fort Donelson National Battlefield	KY	NB	0	0
Mount Rushmore National Memorial	SD	NMEM	0	0
Ebey's Landing National Historical Reserve	WA	OTHER	0	0
Rainbow Bridge National Monument	UT	NM	0	0
Independence National Historical Park	PA	NHP	0	0
Yosemite National Park	CA	NP	20	10
Everglades National Park	FL	NP	10	5
Fire Island National Seashore	NY	NS	0	0
Fort Larned National Historic Site	KS	NHS	0	0
Homestead National Monument of America	NE	NM	0	0
Klondike Gold Rush National Historic Site	WA	NHS	0	0
Yosemite National Park	CA	NP	20	10
Sleeping Bear Dunes National Lakeshore	MI	NL	10	5
Indiana Dunes National Lakeshore	IN	NL	6	1
Acadia National Park	ME	NP	20	5

APPENDIX B: REPORTED MODELS: FULL PARAMETER ESTIMATES AND SIGNIFICANCE

TABLE 27. ESTIMATED PARAMETERS AND SIGNIFICANCE: REPORTED RESULTS, FULL SET OF ESTIMATED PARK MODELS

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
ACAD	2009	CONSTANT	-7.76128	0.156251	756	-49.67	0.0000
ACAD	2009	TRAVELCOST	-0.01376	0.000584	756	-23.54	0.0000
ACAD	2009	INC	-0.09983	0.012945	756	-7.71	0.0000
ACAD	2009	VISITORAGE	0.012804	0.00288	756	4.45	0.0000
ACAD	2009	alpha	104975.1	1.49E-06	756	> 50	-
BICY	2007	CONSTANT	-7.14031	0.280554	490	-25.45	0.0000
BICY	2007	TRAVELCOST	-0.00902	0.000489	490	-18.45	0.0000
BICY	2007	INC	0.020008	0.025186	490	0.79	0.4273
BICY	2007	VISITORAGE	-0.00971	0.004335	490	-2.24	0.0256
BICY	2007	alpha	35802.41	7.84E-06	490	> 50	-
BISC	2001	CONSTANT	-6.44592	0.268187	314	-24.04	0.0000
BISC	2001	TRAVELCOST	-0.01425	0.00091	314	-15.66	0.0000
BISC	2001	INC	0.047333	0.029354	314	1.61	0.1079
BISC	2001	VISITORAGE	-0.00457	0.005732	314	-0.80	0.4257
BISC	2001	alpha	33943.8	7.9E-06	314	> 50	-
BRCA	1997	CONSTANT	1.776291	0.254315	237	6.98	0.0000
BRCA	1997	TRAVELCOST	-0.00816	0.000743	237	-10.97	0.0000
BRCA	1997	INC	0.076559	0.02935	237	2.61	0.0097
BRCA	1997	VISITORAGE	-0.01296	0.003994	237	-3.25	0.0013
BRCA	1997	alpha	0.305887	0.071018	237	4.31	0.0000
CATO	2002	CONSTANT	-7.80541	0.215314	435	-36.25	0.0000
CATO	2002	TRAVELCOST	-0.01252	0.002262	435	-5.53	0.0000
CATO	2002	INC	-0.06756	0.025746	435	-2.62	0.0090
CATO	2002	VISITORAGE	-0.01383	0.003515	435	-3.93	0.0001
CATO	2002	alpha	90764.31	2.37E-06	435	> 50	-
CHAT	1998	CONSTANT	-7.92225	0.174861	641	-45.31	0.0000
CHAT	1998	TRAVELCOST	-0.01928	0.001974	641	-9.76	0.0000
CHAT	1998	INC	0.001702	0.021059	641	0.08	0.9356
CHAT	1998	VISITORAGE	0.02269	0.003332	641	6.81	0.0000
CHAT	1998	alpha	99160.84	1.76E-06	641	> 50	-
CHOH	2003	CONSTANT	-8.80898	0.167066	591	-52.73	0.0000
CHOH	2003	TRAVELCOST	-0.00739	0.000739	591	-10.00	0.0000
CHOH	2003	INC	0.052608	0.012937	591	4.07	0.0001
CHOH	2003	VISITORAGE	0.010503	0.003313	591	3.17	0.0016
CHOH	2003	alpha	101324.1	1.65E-06	591	> 50	-
COLO	2001	CONSTANT	0.629392	0.192899	398	3.26	0.0012
COLO	2001	TRAVELCOST	-0.00437	0.000524	398	-8.34	0.0000
COLO	2001	INC	0.007069	0.018715	398	0.38	0.7058
COLO	2001	VISITORAGE	0.011133	0.003087	398	3.61	0.0004
COLO	2001	alpha	0.384078	0.069649	398	5.51	0.0000
COWP	2003	CONSTANT	-9.73245	0.330304	260	-29.47	0.0000
COWP	2003	TRAVELCOST	-0.04109	0.003232	260	-12.71	0.0000
COWP	2003	INC	-0.07565	0.071489	260	-1.06	0.2909
COWP	2003	VISITORAGE	0.040725	0.004112	260	9.90	0.0000
COWP	2003	alpha	259857.7	1.27E-06	260	> 50	-

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
CRLA	2001	CONSTANT	0.523968	0.235078	410	2.23	0.0264
CRLA	2001	TRAVELCOST	-0.00557	0.000515	410	-10.81	0.0000
CRLA	2001	INC	-0.03065	0.023827	410	-1.29	0.1990
CRLA	2001	VISITORAGE	0.00872	0.003522	410	2.48	0.0137
CRLA	2001	alpha	1.175047	0.251463	410	4.67	0.0000
CRMO	2004	CONSTANT	1.63786	0.216357	361	7.57	0.0000
CRMO	2004	TRAVELCOST	-0.00644	0.00056	361	-11.49	0.0000
CRMO	2004	INC	0.003822	0.020025	361	0.19	0.8487
CRMO	2004	VISITORAGE	-0.00905	0.003472	361	-2.61	0.0095
CRMO	2004	alpha	0.413996	0.085293	361	4.85	0.0000
CUIS	1998	CONSTANT	-6.51747	0.298672	265	-21.82	0.0000
CUIS	1998	TRAVELCOST	-0.02375	0.002028	265	-11.71	0.0000
CUIS	1998	INC	-0.0879	0.047327	265	-1.86	0.0644
CUIS	1998	VISITORAGE	-0.02596	0.004811	265	-5.40	0.0000
CUIS	1998	alpha	91595.87	3.26E-06	265	> 50	-
CUVA	2005	CONSTANT	0.823079	0.267637	834	3.08	0.0022
CUVA	2005	TRAVELCOST	-0.00951	0.001535	834	-6.20	0.0000
CUVA	2005	INC	0.054819	0.016374	834	3.35	0.0009
CUVA	2005	VISITORAGE	-0.01078	0.002798	834	-3.85	0.0001
CUVA	2005	alpha	4.136793	1.080325	834	3.83	0.0001
DRTO	1995	CONSTANT	-8.10256	0.33903	202	-23.90	0.0000
DRTO	1995	TRAVELCOST	-0.01248	0.001284	202	-9.72	0.0000
DRTO	1995	INC	0.00262	0.05355	202	0.05	0.9610
DRTO	1995	VISITORAGE	0.000533	0.006564	202	0.08	0.9354
DRTO	1995	alpha	44709.36	7.58E-06	202	> 50	-
DRTO	2002	CONSTANT	0.818223	0.437073	288	1.87	0.0622
DRTO	2002	TRAVELCOST	-0.0096	0.000711	288	-13.50	0.0000
DRTO	2002	INC	-0.00827	0.027059	288	-0.31	0.7602
DRTO	2002	VISITORAGE	0.005382	0.005504	288	0.98	0.3290
DRTO	2002	alpha	3.132288	1.276224	288	2.45	0.0147
EBLA	2007	CONSTANT	-8.02388	0.362206	303	-22.15	0.0000
EBLA	2007	TRAVELCOST	-0.0035	0.000497	303	-7.04	0.0000
EBLA	2007	INC	-0.11543	0.038875	303	-2.97	0.0032
EBLA	2007	VISITORAGE	0.001509	0.005038	303	0.30	0.7648
EBLA	2007	alpha	91579	3.96E-06	303	> 50	-
EFMO	2004	CONSTANT	-0.01264	0.618938	269	-0.02	0.9837
EFMO	2004	TRAVELCOST	-0.01407	0.001742	269	-8.08	0.0000
EFMO	2004	INC	-0.02212	0.035915	269	-0.62	0.5384
EFMO	2004	VISITORAGE	0.002961	0.005992	269	0.49	0.6216
EFMO	2004	alpha	4.595724	2.81511	269	1.63	0.1037
EVER	1996	CONSTANT	-7.93892	0.2362	452	-33.61	0.0000
EVER	1996	TRAVELCOST	-0.00619	0.000538	452	-11.52	0.0000
EVER	1996	INC	-0.07601	0.031125	452	-2.44	0.0150
EVER	1996	VISITORAGE	0.005012	0.003786	452	1.32	0.1862
EVER	1996	alpha	32579.39	7.25E-06	452	> 50	-
EVER	2002	CONSTANT	-7.84862	0.231688	488	-33.88	0.0000

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
EVER	2002	TRAVELCOST	-0.00918	0.000501	488	-18.31	0.0000
EVER	2002	INC	-0.03529	0.028724	488	-1.23	0.2199
EVER	2002	VISITORAGE	0.008387	0.003871	488	2.17	0.0307
EVER	2002	alpha	36127.3	6.41E-06	488	> 50	-
EVER	2008	CONSTANT	-5.98926	0.217572	628	-27.53	0.0000
EVER	2008	TRAVELCOST	-0.00897	0.000472	628	-18.99	0.0000
EVER	2008	INC	-0.04535	0.019086	628	-2.38	0.0178
EVER	2008	VISITORAGE	-0.01764	0.003601	628	-4.90	0.0000
EVER	2008	alpha	23770.17	9.15E-06	628	> 50	-
FIIS	2008	CONSTANT	-8.75498	0.243528	610	-35.95	0.0000
FIIS	2008	TRAVELCOST	-0.0126	0.001104	610	-11.41	0.0000
FIIS	2008	INC	0.077388	0.019885	610	3.89	0.0001
FIIS	2008	VISITORAGE	9.93E-05	0.00372	610	0.03	0.9787
FIIS	2008	alpha	113418.4	2.15E-06	610	> 50	-
FODO	2007	CONSTANT	-0.36996	1.76425	253	-0.21	0.8341
FODO	2007	TRAVELCOST	-0.01363	0.001936	253	-7.04	0.0000
FODO	2007	INC	-0.04798	0.037711	253	-1.27	0.2044
FODO	2007	VISITORAGE	-0.00819	0.005839	253	-1.40	0.1620
FODO	2007	alpha	16.44053	30.1967	253	0.54	0.5866
FOLS	2009	CONSTANT	0.69526	0.303418	244	2.29	0.0228
FOLS	2009	TRAVELCOST	-0.0082	0.001035	244	-7.92	0.0000
FOLS	2009	INC	-0.02463	0.027489	244	-0.90	0.3711
FOLS	2009	VISITORAGE	0.005011	0.004337	244	1.16	0.2491
FOLS	2009	alpha	0.429796	0.1235	244	3.48	0.0006
FOST	2003	CONSTANT	0.555341	0.361138	192	1.54	0.1258
FOST	2003	TRAVELCOST	-0.00376	0.001081	192	-3.47	0.0006
FOST	2003	INC	-0.04277	0.042189	192	-1.01	0.3119
FOST	2003	VISITORAGE	0.005183	0.005092	192	1.02	0.3100
FOST	2003	alpha	1.134485	0.358631	192	3.16	0.0018
FOSU	2005	CONSTANT	1.13519	0.220403	354	5.15	0.0000
FOSU	2005	TRAVELCOST	-0.0106	0.001124	354	-9.43	0.0000
FOSU	2005	INC	-0.00254	0.019047	354	-0.13	0.8938
FOSU	2005	VISITORAGE	0.002113	0.003775	354	0.56	0.5760
FOSU	2005	alpha	0.4625	0.092588	354	5.00	0.0000
GATE	2003	CONSTANT	-8.15692	0.303548	369	-26.87	0.0000
GATE	2003	TRAVELCOST	-0.00642	0.002101	369	-3.05	0.0024
GATE	2003	INC	0.2985	0.036677	369	8.14	0.0000
GATE	2003	VISITORAGE	-0.00528	0.00368	369	-1.43	0.1523
GATE	2003	alpha	196377.2	1.55E-06	369	> 50	-
GEWA	2004	CONSTANT	-6.80067	0.40369	179	-16.85	0.0000
GEWA	2004	TRAVELCOST	-0.01393	0.002407	179	-5.79	0.0000
GEWA	2004	INC	-0.16252	0.033428	179	-4.86	0.0000
GEWA	2004	VISITORAGE	-0.01521	0.007572	179	-2.01	0.0460
GEWA	2004	alpha	41384.3	9.75E-06	179	> 50	-
GLCA	2007	CONSTANT	-5.09583	2.782221	514	-1.83	0.0676
GLCA	2007	TRAVELCOST	-0.01396	0.000818	514	-17.07	0.0000

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
GLCA	2007	INC	-0.02072	0.01932	514	-1.07	0.2840
GLCA	2007	VISITORAGE	-0.00316	0.003529	514	-0.89	0.3716
GLCA	2007	alpha	6016.862	16701.67	514	0.36	0.7188
GOSP	2006	CONSTANT	0.876733	0.334163	239	2.62	0.0093
GOSP	2006	TRAVELCOST	-0.00575	0.000663	239	-8.67	0.0000
GOSP	2006	INC	0.043205	0.027927	239	1.55	0.1232
GOSP	2006	VISITORAGE	-0.0069	0.004505	239	-1.53	0.1269
GOSP	2006	alpha	1.1034	0.320359	239	3.44	0.0007
GRSA	2002	CONSTANT	0.333295	0.25642	327	1.30	0.1946
GRSA	2002	TRAVELCOST	-0.01154	0.00096	327	-12.02	0.0000
GRSA	2002	INC	0.088123	0.024297	327	3.63	0.0003
GRSA	2002	VISITORAGE	0.009722	0.004342	327	2.24	0.0258
GRSA	2002	alpha	1.262007	0.294393	327	4.29	0.0000
GRSM	1996	CONSTANT	-7.5775	0.125943	1654	-60.17	-
GRSM	1996	TRAVELCOST	-0.02504	0.000904	1654	-27.72	0.0000
GRSM	1996	INC	-0.0571	0.0208	1654	-2.75	0.0061
GRSM	1996	VISITORAGE	0.005325	0.002045	1654	2.60	0.0093
GRSM	1996	alpha	33042.98	3.81E-06	1654	> 50	-
HALE	2000	CONSTANT	2.907184	1.116413	30	2.60	0.0142
HALE	2000	TRAVELCOST	-0.20015	0.065653	30	-3.05	0.0048
HALE	2000	INC	-0.00021	0.169547	30	0.00	0.9990
HALE	2000	VISITORAGE	-0.01312	0.011512	30	-1.14	0.2636
HALE	2000	alpha	1.336194	0.890959	30	1.50	0.1441
HOFU	2002	CONSTANT	0.157122	0.480097	225	0.33	0.7438
HOFU	2002	TRAVELCOST	-0.00676	0.001774	225	-3.81	0.0002
HOFU	2002	INC	0.008136	0.041281	225	0.20	0.8439
HOFU	2002	VISITORAGE	-0.00062	0.005557	225	-0.11	0.9117
HOFU	2002	alpha	2.911147	1.299569	225	2.24	0.0261
HOME	2009	CONSTANT	0.487097	0.633501	234	0.77	0.4427
HOME	2009	TRAVELCOST	-0.00765	0.001097	234	-6.97	0.0000
HOME	2009	INC	-0.07241	0.038115	234	-1.90	0.0587
HOME	2009	VISITORAGE	-0.00343	0.00494	234	-0.69	0.4879
HOME	2009	alpha	4.40503	2.764944	234	1.59	0.1125
INDE	2007	CONSTANT	1.113532	0.254727	714	4.37	0.0000
INDE	2007	TRAVELCOST	-0.00606	0.000455	714	-13.34	0.0000
INDE	2007	INC	-0.03581	0.014881	714	-2.41	0.0164
INDE	2007	VISITORAGE	-0.00938	0.003114	714	-3.01	0.0027
INDE	2007	alpha	2.935383	0.720333	714	4.08	0.0001
INDU	2009	CONSTANT	-7.22851	0.232452	486	-31.10	0.0000
INDU	2009	TRAVELCOST	-0.02001	0.002144	486	-9.33	0.0000
INDU	2009	INC	-0.07678	0.021868	486	-3.51	0.0005
INDU	2009	VISITORAGE	-0.00466	0.003799	486	-1.23	0.2209
INDU	2009	alpha	53464.88	4.35E-06	486	> 50	-
JELA	1998	CONSTANT	-8.12681	0.220996	435	-36.77	0.0000
JELA	1998	TRAVELCOST	-0.01066	0.000586	435	-18.19	0.0000
JELA	1998	INC	-0.2219	0.033389	435	-6.65	0.0000

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
JELA	1998	VISITORAGE	0.013118	0.003484	435	3.77	0.0002
JELA	1998	alpha	125809.3	1.76E-06	435	> 50	-
JOFI	2006	CONSTANT	0.227816	0.210264	257	1.08	0.2796
JOFI	2006	TRAVELCOST	-0.00037	0.000433	257	-0.85	0.3963
JOFI	2006	INC	0.007823	0.016319	257	0.48	0.6321
JOFI	2006	VISITORAGE	-0.00166	0.003944	257	-0.42	0.6745
JOFI	2006	alpha	9.69E-08		257		
JOFL	2005	CONSTANT	0.793273	1.223775	211	0.65	0.5175
JOFL	2005	TRAVELCOST	-0.00466	0.001478	211	-3.16	0.0018
JOFL	2005	INC	-0.13291	0.03464	211	-3.84	0.0002
JOFL	2005	VISITORAGE	-0.01981	0.005857	211	-3.38	0.0009
JOFL	2005	alpha	10.26526	13.2232	211	0.78	0.4384
KATM	2006	CONSTANT	1.326159	0.069482	5	19.09	0.0000
KATM	2006	TRAVELCOST	-0.0026	0	5		-
KATM	2006	INC	-3.24589	0.457182	5	-7.10	0.0009
KATM	2006	VISITORAGE	0.211575	0.055983	5	3.78	0.0129
KATM	2006	alpha	112228.2	0	5		-
KIMO	2006	CONSTANT	-7.48523	0.371782	216	-20.13	0.0000
KIMO	2006	TRAVELCOST	-0.01043	0.00155	216	-6.73	0.0000
KIMO	2006	INC	-0.12807	0.051094	216	-2.51	0.0129
KIMO	2006	VISITORAGE	0.000689	0.006049	216	0.11	0.9094
KIMO	2006	alpha	24594.36	1.51E-05	216	> 50	-
KLSE	2009	CONSTANT	-11.8791	0.631537	194	-18.81	0.0000
KLSE	2009	TRAVELCOST	-0.01133	0.001359	194	-8.34	0.0000
KLSE	2009	INC	0.138092	0.058891	194	2.34	0.0200
KLSE	2009	VISITORAGE	-0.00166	0.010158	194	-0.16	0.8706
KLSE	2009	alpha	318582.6	1.98E-06	194	> 50	-
KNRI	2003	CONSTANT	1.072271	0.314924	239	3.40	0.0008
KNRI	2003	TRAVELCOST	-0.00914	0.000894	239	-10.22	0.0000
KNRI	2003	INC	0.001032	0.037152	239	0.03	0.9779
KNRI	2003	VISITORAGE	0.001803	0.004997	239	0.36	0.7185
KNRI	2003	alpha	0.679958	0.174491	239	3.90	0.0001
LIBO	1997	CONSTANT	0.523205	0.401522	382	1.30	0.1933
LIBO	1997	TRAVELCOST	-0.0053	0.001162	382	-4.56	0.0000
LIBO	1997	INC	0.052598	0.040176	382	1.31	0.1913
LIBO	1997	VISITORAGE	-0.01397	0.003913	382	-3.57	0.0004
LIBO	1997	alpha	3.931517	1.594473	382	2.47	0.0141
LIHO	2005	CONSTANT	-7.19499	4.337563	412	-1.66	0.0979
LIHO	2005	TRAVELCOST	-0.0157	0.001454	412	-10.80	0.0000
LIHO	2005	INC	-0.0026	0.02698	412	-0.10	0.9232
LIHO	2005	VISITORAGE	-0.00945	0.004756	412	-1.99	0.0477
LIHO	2005	alpha	17093.01	73991.31	412	0.23	0.8174
LOWE	1997	CONSTANT	-7.45802	0.324156	375	-23.01	0.0000
LOWE	1997	TRAVELCOST	-0.00832	0.000856	375	-9.72	0.0000
LOWE	1997	INC	-0.06252	0.03211	375	-1.95	0.0523
LOWE	1997	VISITORAGE	-0.00114	0.004898	375	-0.23	0.8156

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
LOWE	1997	alpha	17085.92	1.9E-05	375	> 50	-
MORA	2000	CONSTANT	-5.53854	1.985598	706	-2.79	0.0054
MORA	2000	TRAVELCOST	-0.00526	0.000337	706	-15.58	0.0000
MORA	2000	INC	-0.02874	0.023872	706	-1.20	0.2291
MORA	2000	VISITORAGE	-0.00874	0.003493	706	-2.50	0.0125
MORA	2000	alpha	3903.855	7715.426	706	0.51	0.6130
MORU	2007	CONSTANT	1.596655	0.15402	555	10.37	0.0000
MORU	2007	TRAVELCOST	-0.01259	0.000644	555	-19.56	0.0000
MORU	2007	INC	-0.03013	0.013831	555	-2.18	0.0298
MORU	2007	VISITORAGE	0.011566	0.002537	555	4.56	0.0000
MORU	2007	alpha	0.364959	0.048764	555	7.48	0.0000
NECA	1998	CONSTANT	-8.3753	0.235425	495	-35.58	0.0000
NECA	1998	TRAVELCOST	-0.01576	0.000768	495	-20.52	0.0000
NECA	1998	INC	-0.0383	0.024062	495	-1.59	0.1121
NECA	1998	VISITORAGE	0.020331	0.004207	495	4.83	0.0000
NECA	1998	alpha	103033.6	2.28E-06	495	> 50	-
NERI	2004	CONSTANT	-5.93045	0.187193	483	-31.68	0.0000
NERI	2004	TRAVELCOST	-0.01938	0.001635	483	-11.86	0.0000
NERI	2004	INC	-0.15825	0.024776	483	-6.39	0.0000
NERI	2004	VISITORAGE	-0.02494	0.003357	483	-7.43	0.0000
NERI	2004	alpha	43238.64	4.33E-06	483	> 50	-
OLYM	2000	CONSTANT	-6.87797	0.192265	788	-35.77	0.0000
OLYM	2000	TRAVELCOST	-0.00657	0.000334	788	-19.70	0.0000
OLYM	2000	INC	-0.1394	0.023723	788	-5.88	0.0000
OLYM	2000	VISITORAGE	-0.00214	0.003076	788	-0.69	0.4874
OLYM	2000	alpha	26030.2	7.39E-06	788	> 50	-
PINN	2002	CONSTANT	-4.12463	3.651708	356	-1.13	0.2594
PINN	2002	TRAVELCOST	-0.00743	0.001364	356	-5.45	0.0000
PINN	2002	INC	-0.04311	0.021992	356	-1.96	0.0508
PINN	2002	VISITORAGE	0.001185	0.004955	356	0.24	0.8111
PINN	2002	alpha	452.574	1651.747	356	0.27	0.7842
PIRO	2001	CONSTANT	-8.35963	0.280957	456	-29.75	0.0000
PIRO	2001	TRAVELCOST	-0.02198	0.001352	456	-16.26	0.0000
PIRO	2001	INC	-0.15822	0.031785	456	-4.98	0.0000
PIRO	2001	VISITORAGE	0.033067	0.004508	456	7.33	0.0000
PIRO	2001	alpha	31852.35	8.82E-06	456	> 50	-
RABR	2007	CONSTANT	2.138881	0.235492	214	9.08	0.0000
RABR	2007	TRAVELCOST	-0.00379	0.00075	214	-5.05	0.0000
RABR	2007	INC	-0.02328	0.017821	214	-1.31	0.1928
RABR	2007	VISITORAGE	-0.00207	0.00408	214	-0.51	0.6116
RABR	2007	alpha	0.557949	0.114375	214	4.88	0.0000
SAAN	1994	CONSTANT	-7.52189	0.237401	344	-31.68	0.0000
SAAN	1994	TRAVELCOST	-0.01855	0.001019	344	-18.19	0.0000
SAAN	1994	INC	0.102651	0.044308	344	2.32	0.0211
SAAN	1994	VISITORAGE	-0.01608	0.00432	344	-3.72	0.0002
SAAN	1994	alpha	52950.42	4.48E-06	344	> 50	-

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
SAFR	1995	CONSTANT	-0.09947	0.242795	436	-0.41	0.6822
SAFR	1995	TRAVELCOST	-0.00479	0.000433	436	-11.05	0.0000
SAFR	1995	INC	0.027628	0.022741	436	1.21	0.2251
SAFR	1995	VISITORAGE	0.011655	0.003576	436	3.26	0.0012
SAFR	1995	alpha	1.642721	0.393177	436	4.18	0.0000
SAFR	2005	CONSTANT	0.048254	1.395334	355	0.03	0.9724
SAFR	2005	TRAVELCOST	-0.00549	0.000403	355	-13.64	0.0000
SAFR	2005	INC	-0.06308	0.024082	355	-2.62	0.0092
SAFR	2005	VISITORAGE	-0.00885	0.004941	355	-1.79	0.0742
SAFR	2005	alpha	15.76591	22.78426	355	0.69	0.4894
SAGA	2004	CONSTANT	-0.09003	0.330626	247	-0.27	0.7856
SAGA	2004	TRAVELCOST	-0.00308	0.000836	247	-3.68	0.0003
SAGA	2004	INC	-0.02069	0.022046	247	-0.94	0.3488
SAGA	2004	VISITORAGE	0.012266	0.004435	247	2.77	0.0061
SAGA	2004	alpha	1.199511	0.356748	247	3.36	0.0009
SEKI	2001	CONSTANT	-6.01037	0.235388	462	-25.53	0.0000
SEKI	2001	TRAVELCOST	-0.0081	0.000547	462	-14.81	0.0000
SEKI	2001	INC	-0.11999	0.02397	462	-5.01	0.0000
SEKI	2001	VISITORAGE	0.002284	0.004171	462	0.55	0.5842
SEKI	2001	alpha	9519.322	2.47E-05	462	> 50	-
SHEN	2001	CONSTANT	-6.98334	3.198419	593	-2.18	0.0294
SHEN	2001	TRAVELCOST	-0.01406	0.001056	593	-13.32	0.0000
SHEN	2001	INC	-0.08593	0.021592	593	-3.98	0.0001
SHEN	2001	VISITORAGE	-0.00083	0.004024	593	-0.21	0.8372
SHEN	2001	alpha	17794.1	56769.66	593	0.31	0.7541
SLBE	2009	CONSTANT	-7.94776	0.198353	673	-40.07	0.0000
SLBE	2009	TRAVELCOST	-0.01522	0.000934	673	-16.30	0.0000
SLBE	2009	INC	-0.11693	0.014909	673	-7.84	0.0000
SLBE	2009	VISITORAGE	0.01186	0.00344	673	3.45	0.0006
SLBE	2009	alpha	57313.13	3.46E-06	673	> 50	-
STRI	2002	CONSTANT	-7.09913	17.50832	260	-0.41	0.6855
STRI	2002	TRAVELCOST	-0.01462	0.001384	260	-10.57	0.0000
STRI	2002	INC	0.051208	0.050784	260	1.01	0.3142
STRI	2002	VISITORAGE	0.005852	0.006399	260	0.91	0.3613
STRI	2002	alpha	5598.224	98008.13	260	0.06	0.9545
USAR	2000	CONSTANT	2.296366	0.16348	342	14.05	0.0000
USAR	2000	TRAVELCOST	-0.00374	0.000203	342	-18.42	0.0000
USAR	2000	INC	-0.04086	0.017	342	-2.40	0.0168
USAR	2000	VISITORAGE	0.004467	0.00285	342	1.57	0.1180
USAR	2000	alpha	0.258352	0.043914	342	5.88	0.0000
VOYA	1997	CONSTANT	-7.46938	0.184822	645	-40.41	0.0000
VOYA	1997	TRAVELCOST	-0.01131	0.000743	645	-15.22	0.0000
VOYA	1997	INC	-0.09193	0.029574	645	-3.11	0.0020
VOYA	1997	VISITORAGE	-0.00269	0.003563	645	-0.76	0.4501
VOYA	1997	alpha	57700.61	3.2E-06	645	> 50	-
YELL	2006	CONSTANT	-1.40904	0.971664	739	-1.45	0.1474

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t-Value	Prob
YELL	2006	TRAVELCOST	-0.00786	0.000446	739	-17.63	0.0000
YELL	2006	INC	-0.03773	0.01575	739	-2.40	0.0169
YELL	2006	VISITORAGE	0.029323	0.003243	739	9.04	0.0000
YELL	2006	alpha	17.09937	17.2529	739	0.99	0.3220
YOSE	2005	CONSTANT	0.721011	0.249949	609	2.88	0.0041
YOSE	2005	TRAVELCOST	-0.00655	0.000418	609	-15.66	0.0000
YOSE	2005	INC	0.01576	0.014346	609	1.10	0.2724
YOSE	2005	VISITORAGE	0.001667	0.003152	609	0.53	0.5971
YOSE	2005	alpha	2.265359	0.512034	609	4.42	0.0000
YOSE	2008	CONSTANT	0.514165	0.729413	474	0.70	0.4812
YOSE	2008	TRAVELCOST	-0.00935	0.000877	474	-10.67	0.0000
YOSE	2008	INC	-0.05222	0.018327	474	-2.85	0.0046
YOSE	2008	VISITORAGE	-0.00469	0.00357	474	-1.31	0.1898
YOSE	2008	alpha	9.808223	7.483453	474	1.31	0.1906
YOSE	2009	CONSTANT	0.462783	0.460458	497	1.01	0.3154
YOSE	2009	TRAVELCOST	-0.00746	0.000469	497	-15.89	0.0000
YOSE	2009	INC	-0.03404	0.016298	497	-2.09	0.0372
YOSE	2009	VISITORAGE	0.004531	0.00319	497	1.42	0.1561
YOSE	2009	alpha	5.872944	2.819	497	2.08	0.0377

TABLE 28. ESTIMATED PARAMETERS AND SIGNIFICANCE: REPORTED RESULTS, SET OF ESTIMATED PARK MODELS WITH PRIMARY PURPOSE VARIABLES.

PARK	YEAR	Parameter	Estimate	DF	tValue	Prob
CHOH	2003	CONSTANT	-9.04694	578	-49.33	0.0000
CHOH	2003	TRAVELCOST	-0.00921	578	-9.63	0.0000
CHOH	2003	INC	0.04641	578	3.44	0.0006
CHOH	2003	VISITORAGE	0.01345	578	3.95	0.0001
CHOH	2003	PRIME	0.31992	578	3.22	0.0014
CHOH	2003	PRIME_TC	0.0048	578	3.06	0.0023
CHOH	2003	alpha	92163.3	578	> 50	-
EBLA	2007	CONSTANT	-8.56256	288	-23.11	0.0000
EBLA	2007	TRAVELCOST	-0.00245	288	-4.64	0.0000
EBLA	2007	INC	-0.05992	288	-1.49	0.1362
EBLA	2007	VISITORAGE	-0.00428	288	-0.77	0.4401
EBLA	2007	PRIME	0.98211	288	6.99	0.0000
EBLA	2007	PRIME_TC	-0.00807	288	-2.62	0.0093
EBLA	2007	alpha	100004	288	> 50	-
EFMO	2004	CONSTANT	0.45996	267	1.13	0.2591
EFMO	2004	TRAVELCOST	-0.01025	267	-6.23	0.0000
EFMO	2004	INC	0.0128	267	0.38	0.7078
EFMO	2004	VISITORAGE	-0.00525	267	-0.91	0.3626
EFMO	2004	PRIME	1.50648	267	6.69	0.0000
EFMO	2004	PRIME_TC	-0.05536	267	-4.27	0.0000
EFMO	2004	alpha	1.97085	267	2.87	0.0044
FODO	2007	CONSTANT	0.13549	253	0.19	0.8508
FODO	2007	TRAVELCOST	-0.0104	253	-5.56	0.0000
FODO	2007	INC	-0.02389	253	-0.66	0.5101
FODO	2007	VISITORAGE	-0.00754	253	-1.33	0.1862
FODO	2007	PRIME	0.8309	253	4.58	0.0000
FODO	2007	PRIME_TC	-0.02207	253	-3.26	0.0013
FODO	2007	alpha	5.84688	253	1.35	0.1777
FOLS	2009	CONSTANT	0.44591	244	1.43	0.1526
FOLS	2009	TRAVELCOST	-0.00639	244	-5.56	0.0000
FOLS	2009	INC	-0.00833	244	-0.30	0.7638
FOLS	2009	VISITORAGE	0.0043	244	1.00	0.3168
FOLS	2009	PRIME	0.50303	244	3.16	0.0017
FOLS	2009	PRIME_TC	-0.00366	244	-0.93	0.3529
FOLS	2009	alpha	0.38018	244	3.47	0.0006
GRSA	2002	CONSTANT	0.1563	325	0.60	0.5480
GRSA	2002	TRAVELCOST	-0.01008	325	-9.88	0.0000
GRSA	2002	INC	0.09327	325	3.76	0.0002
GRSA	2002	VISITORAGE	0.01048	325	2.41	0.0165
GRSA	2002	PRIME	0.53058	325	3.32	0.0010
GRSA	2002	PRIME_TC	-0.00725	325	-1.82	0.0702
GRSA	2002	alpha	1.134	325	4.44	0.0000
GRSM	1996	CONSTANT	-7.58415	1654	-3.11	0.0019
GRSM	1996	TRAVELCOST	-0.02175	1654	-14.82	0.0000
GRSM	1996	INC	-0.04771	1654	-2.30	0.0217

PARK	YEAR	Parameter	Estimate	DF	tValue	Prob
GRSM	1996	VISITORAGE	0.00439	1654	2.13	0.0335
GRSM	1996	PRIME	0.7016	1654	9.16	0.0000
GRSM	1996	PRIME_TC	-0.00465	1654	-2.52	0.0120
GRSM	1996	alpha	21092.4	1654	0.41	0.6809
HALE	2000	CONSTANT	0.87229	28	0.89	0.3799
HALE	2000	TRAVELCOST	0.07247	28	0.68	0.5012
HALE	2000	INC	0.18874	28	1.42	0.1667
HALE	2000	VISITORAGE	-0.0155	28	-1.38	0.1800
HALE	2000	PRIME	2.3738	28	3.55	0.0014
HALE	2000	PRIME_TC	-0.36478	28	-2.61	0.0145
HALE	2000	alpha	0.47612	28	1.94	0.0630
HOFU	2002	CONSTANT	0.29975	222	0.68	0.4949
HOFU	2002	TRAVELCOST	-0.00566	222	-2.91	0.0040
HOFU	2002	INC	0.01142	222	0.28	0.7771
HOFU	2002	VISITORAGE	-0.00588	222	-1.04	0.2972
HOFU	2002	PRIME	0.42121	222	2.98	0.0033
HOFU	2002	PRIME_TC	-0.0011	222	-0.27	0.7837
HOFU	2002	alpha	2.36251	222	2.54	0.0117
INDE	2007	CONSTANT	1.11149	705	4.44	0.0000
INDE	2007	TRAVELCOST	-0.00601	705	-11.37	0.0000
INDE	2007	INC	-0.03161	705	-2.12	0.0347
INDE	2007	VISITORAGE	-0.00904	705	-2.88	0.0041
INDE	2007	PRIME	-0.03348	705	-0.33	0.7413
INDE	2007	PRIME_TC	-8.3E-05	705	-0.08	0.9357
INDE	2007	alpha	2.79582	705	4.18	0.0000
KATM	2006	CONSTANT	1.32841	5	14.93	0.0000
KATM	2006	TRAVELCOST	-0.0026	5	-	-
KATM	2006	INC	-3.23109	5	-5.52	0.0027
KATM	2006	VISITORAGE	0.23074	5	3.35	0.0203
KATM	2006	PRIME	2.35133	5	2.27	0.0727
KATM	2006	PRIME_TC	0.0001	5	-	-
KATM	2006	alpha	5837.18	5	> 50	0.0000
KIMO	2006	CONSTANT	-7.22598	214	-2.12	0.0352
KIMO	2006	TRAVELCOST	-0.0079	214	-4.81	0.0000
KIMO	2006	INC	-0.14238	214	-2.77	0.0062
KIMO	2006	VISITORAGE	0.00323	214	0.52	0.6009
KIMO	2006	PRIME	0.72534	214	4.24	0.0000
KIMO	2006	PRIME_TC	-0.00169	214	-0.42	0.6742
KIMO	2006	alpha	11410.5	214	0.30	0.7681
KNRI	2003	CONSTANT	1.08648	237	3.39	0.0008
KNRI	2003	TRAVELCOST	-0.00918	237	-9.57	0.0000
KNRI	2003	INC	0.00382	237	0.10	0.9186
KNRI	2003	VISITORAGE	0.00174	237	0.35	0.7301
KNRI	2003	PRIME	0.01763	237	0.09	0.9280
KNRI	2003	PRIME_TC	-0.00865	237	-1.13	0.2592
KNRI	2003	alpha	0.66966	237	3.87	0.0001
LIBO	1997	CONSTANT	0.65014	381	2.27	0.0237

PARK	YEAR	Parameter	Estimate	DF	tValue	Prob
LIBO	1997	TRAVELCOST	-0.00285	381	-2.41	0.0164
LIBO	1997	INC	0.05222	381	1.41	0.1585
LIBO	1997	VISITORAGE	-0.01176	381	-3.02	0.0027
LIBO	1997	PRIME	0.8821	381	6.25	0.0000
LIBO	1997	PRIME_TC	-0.03634	381	-2.33	0.0202
LIBO	1997	alpha	1.9914	381	3.67	0.0003
LOWE	1997	CONSTANT	-6.38498	367	-0.99	0.3240
LOWE	1997	TRAVELCOST	-0.00544	367	-6.05	0.0000
LOWE	1997	INC	-0.05106	367	-1.61	0.1090
LOWE	1997	VISITORAGE	0.00135	367	0.27	0.7859
LOWE	1997	PRIME	0.78678	367	5.82	0.0000
LOWE	1997	PRIME_TC	-0.00813	367	-2.70	0.0073
LOWE	1997	alpha	2804.67	367	0.15	0.8770
MORU	2007	CONSTANT	1.5987	551	10.18	0.0000
MORU	2007	TRAVELCOST	-0.01261	551	-18.37	0.0000
MORU	2007	INC	-0.03068	551	-2.20	0.0285
MORU	2007	VISITORAGE	0.01155	551	4.53	0.0000
MORU	2007	PRIME	0.01272	551	0.09	0.9295
MORU	2007	PRIME_TC	6.7E-05	551	0.03	0.9725
MORU	2007	alpha	0.36695	551	7.46	0.0000
NERI	2004	CONSTANT	-6.63756	477	-29.61	0.0000
NERI	2004	TRAVELCOST	-0.01213	477	-6.78	0.0000
NERI	2004	INC	-0.13491	477	-5.52	0.0000
NERI	2004	VISITORAGE	-0.01675	477	-4.52	0.0000
NERI	2004	PRIME	1.1855	477	10.04	0.0000
NERI	2004	PRIME_TC	-0.01167	477	-3.58	0.0004
NERI	2004	alpha	25320.5	477	> 50	-
PIRO	2001	CONSTANT	0.00057	449	0.00	0.9990
PIRO	2001	TRAVELCOST	-0.01213	449	-9.31	0.0000
PIRO	2001	INC	-0.04427	449	-1.48	0.1409
PIRO	2001	VISITORAGE	0.00979	449	1.96	0.0503
PIRO	2001	PRIME	1.74688	449	11.93	0.0000
PIRO	2001	PRIME_TC	-0.04268	449	-9.47	0.0000
PIRO	2001	alpha	4.07174	449	2.55	0.0111
SHEN	2001	CONSTANT	-0.58181	583	-0.49	0.6219
SHEN	2001	TRAVELCOST	-0.00846	583	-8.33	0.0000
SHEN	2001	INC	-0.10486	583	-5.04	0.0000
SHEN	2001	VISITORAGE	-0.00155	583	-0.38	0.7020
SHEN	2001	PRIME	1.31742	583	10.85	0.0000
SHEN	2001	PRIME_TC	-0.0284	583	-7.28	0.0000
SHEN	2001	alpha	17.0398	583	0.82	0.4128
STRI	2002	CONSTANT	-0.15778	250	-0.33	0.7410
STRI	2002	TRAVELCOST	-0.00759	250	-5.80	0.0000
STRI	2002	INC	0.01853	250	0.43	0.6656
STRI	2002	VISITORAGE	-0.00291	250	-0.51	0.6137
STRI	2002	PRIME	1.59842	250	9.41	0.0000
STRI	2002	PRIME_TC	-0.01616	250	-3.12	0.0020

PARK	YEAR	Parameter	Estimate	DF	tValue	Prob
STRI	2002	alpha	2.85161	250	2.24	0.0259

APPENDIX C: SENSITIVITY ANALYSIS: ESTIMATED MODEL COEFFICIENTS,
SIGNIFICANCE AND ESTIMATED NEV PER TRIP VALUES-FULL IRS
REIMBURSEMENT RATE

TABLE 29. SENSITIVITY ANALYSIS: FULL PARK UNIT SET, PRIMARY TRAVEL COST PARAMETER ESTIMATES, FULL IRS REIMBURSEMENT RATE PER MILE.

PARKNAME	YEAR	TRAVEL COST PARAMETER ESTIMATE	T-STAT	DF	PROB-T
Acadia National Park	2009	-0.00268	-18.21	723	2.9E-61
Big Cypress National Preserve	2007	-0.00226	-15.96	483	2.3E-46
Biscayne National Park	2001	-0.00538	-13.79	273	3.6E-33
Bryce Canyon National Park	1997	-0.00249	-9.44	208	7.7E-18
Catoctin Mountain Park	2002	-0.00326	-5.14	371	4.5E-07
Chattahoochee River National Recreation Area	1998	-0.00661	-8.17	494	2.6E-15
C & O Canal National Historical Park	2003	-0.00235	-8.23	509	1.6E-15
Colonial National Historical Park (Jamestown)	2001	-0.0015	-7.58	364	2.8E-13
Cowpens National Battlefield	2003	-0.0085	-7.28	221	5.7E-12
Crater Lake National Park	2001	-0.00178	-9.22	372	2.3E-18
Craters of the Moon National Monument & Preserve	2004	-0.00208	-9.46	284	1.2E-18
Cumberland Island National Seashore	1998	-0.00431	-6.25	198	2.4E-09
Cuyahoga Valley National Park	2005	-0.00245	-5.61	762	2.8E-08
Dry Tortugas National Park	1995	-0.00446	-7.55	173	2.4E-12
Dry Tortugas National Park	2002	-0.00189	-8.71	257	3.8E-16
Ebey's Landing National Historical Reserve	2007	-0.00079	-5.36	251	1.8E-07
Effigy Mounds National Monument	2004	-0.00451	-6.89	234	5.1E-11
Everglades National Park	1996	-0.00235	-9.95	433	3.9E-21
Everglades National Park	2002	-0.00349	-17.67	442	3.0E-53
Everglades National Park	2008	-0.00201	-16.57	517	9.3E-50
Fire Island National Seashore	2008	-0.00278	-10.70	575	1.7E-24
Fort Donelson National Battlefield	2007	-0.00372	-6.59	218	3.2E-10
Fort Larned National Historic Site	2009	-0.00185	-7.52	241	1.1E-12
Fort Stanwix NM	2003	-0.00115	-2.90	159	4.3E-03
Fort Sumter National Monument	2005	-0.00303	-7.79	286	1.3E-13
Gateway National Recreation Area - Floyd Bennett Field Visitor Study	2003	-0.00137	-1.51	288	1.3E-01*
George Washington Birthplace National Monument	2004	-0.00506	-5.59	157	9.7E-08
Glen Canyon National Recreation Area	2007	-0.00362	-14.31	362	3.9E-37
Golden Spike National Historic Site	2006	-0.00173	-8.27	230	1.1E-14
Great Sand Dunes National Monumnet & Preserve	2002	-0.00343	-9.03	246	5.0E-17
Great Smoky Mountains National Park	1996	-0.00871	-22.16	1580	5.8E-95
Haleakala National Park (Summit)	2000	-0.04013	-0.80	25	4.3E-01*
Hopewell Furnace National Historic Site	2002	-0.00239	-3.45	200	6.8E-04
Homestead National Monument of America	2009	-0.00194	-6.93	233	4.0E-11
Independence National Historical Park	2007	-0.00149	-11.45	584	1.6E-27
Indiana Dunes National Lakeshore	2009	-0.00458	-8.62	457	1.1E-16
Jean Lafitte National Historical Park & Preserve	1998	-0.00334	-13.82	398	9.6E-36
John F. Kennedy National Historic Site	2006	-0.00014	-0.97	234	3.4E-01*
Johnstown Flood National Memorial	2005	-0.00132	-2.27	157	2.4E-02
Katmai National Park & Preserve	2006	-0.0026		3	0.0E+00

PARKNAME	YEAR	TRAVEL COST PARAMETER ESTIMATE	T-STAT	DF	PROB-T
Kings Mountain National Military Park	2006	-0.00297	-6.22	200	2.9E-09
Klondike Gold Rush National Historic Site	2009	-0.00202	-6.74	193	1.8E-10
Knife River Indian Village NHS	2003	-0.0033	-9.28	207	2.3E-17
Lincoln Boyhood Home National Memorial	1997	-0.0017	-3.84	324	1.5E-04
Lincoln Home National Historic Site	2005	-0.00251	-6.66	329	1.2E-10
Lowell National Historical Park	1997	-0.00268	-8.27	332	3.2E-15
Mount Rainier National Park	2000	-0.00207	-14.52	665	1.1E-41
Mount Rushmore National Memorial	2007	-0.00257	-14.05	435	2.9E-37
Iwo Jima/Netherlands Carillon Memorials	1998	-0.00385	-11.29	300	7.2E-25
New River Gorge National River	2004	-0.00494	-7.64	353	2.1E-13
Olympic National Park	2000	-0.00241	-16.92	701	4.3E-54
Pinnacles National Monument	2002	-0.00215	-4.56	323	7.1E-06
Pictured Rocks National Lakeshore	2001	-0.00685	-12.32	382	1.3E-29
Rainbow Bridge National Monument	2007	-0.00061	-3.01	132	3.1E-03
San Antonio Missions National Historical Park	1994	-0.00588	-11.91	316	2.9E-27
San Francisco Maritime National Historical Park	1995	-0.00222	-10.50	428	4.1E-23
San Francisco Maritime National Historical Park	2005	-0.00134	-10.80	301	3.3E-23
Saint-Gaudens National Historic Site	2004	-0.00112	-2.98	169	3.3E-03
Sequoia & Kings Canyon National Parks and Sequoia National Forest	2001	-0.00273	-11.71	388	2.6E-27
Shenandoah National Park	2001	-0.00489	-11.12	513	7.2E-26
Sleeping Bear Dunes National Lakeshore	2009	-0.00296	-12.40	626	9.7E-32
Stones River National Battlefield	2002	-0.00559	-9.45	225	4.7E-18
USS Arizona Memorial	2000	-0.00105	-13.41	271	8.6E-32
Voyageurs National Park	1997	-0.00398	-13.70	542	6.5E-37
Yellowstone National Park	2006	-0.0019	-13.66	704	7.2E-38
Yosemite National Park	2005	-0.00194	-13.10	511	5.0E-34
Yosemite National Park	2008	-0.00203	-8.93	382	1.8E-17
Yosemite National Park	2009	-0.00148	-13.40	462	8.0E-35

TABLE 30. SENSITIVITY ANALYSIS: FULL PARK UNIT SET, ESTIMATED NEV PER TRIP, COMPARISON OF FULL IRS REIMBURSEMENT RATE TO IRS CHARITY RATE.

PARK	PARKNAME	TYPE	YEAR	NEV/ PERSON / TRIP Full IRS Rate	NEV/ PERSON / TRIP IRS Charity Rate
ACAD	Acadia National Park	NP	2009	\$ 372.66	\$ 72.70
BICY	Big Cypress National Preserve	NP&PRES	2007	\$ 442.95	\$ 110.92
BISC	Biscayne National Park	NP	2001	\$ 185.96	\$ 70.17
BRCA	Bryce Canyon National Park	NP	1997	\$ 402.23	\$ 122.58
CATO	Catoctin Mountain Park	OTHER	2002	\$ 307.11	\$ 79.90
CHAT	Chattahoochee River National Recreation Area	NRA	1998	\$ 151.19	\$ 51.87
CHOH	C & O Canal National Historical Park	NHP	2003	\$ 425.99	\$ 135.27
COLO	Colonial National Historical Park (Jamestown)	NHP	2001	\$ 665.48	\$ 228.81
COWP	Cowpens National Battlefield	NB	2003	\$ 117.67	\$ 24.34
CRLA	Crater Lake National Park	NP	2001	\$ 563.11	\$ 179.61
CRMO	Craters of the Moon National Monument & Preserve	NM	2004	\$ 479.78	\$ 155.27
CUIS	Cumberland Island National Seashore	NS	1998	\$ 231.88	\$ 42.10
CUVA	Cuyahoga Valley National Park	NP	2005	\$ 407.37	\$ 105.10
DRTO	Dry Tortugas National Park	NP	1995	\$ 224.04	\$ 80.13
DRTO	Dry Tortugas National Park	NP	2002	\$ 528.21	\$ 104.21
EBLA	Ebey's Landing National Historical Reserve	OTHER	2007	\$ 1,260.27	\$ 285.87
EFMO	Effigy Mounds National Monument	NM	2004	\$ 221.87	\$ 71.08
EVER	Everglades National Park	NP	1996	\$ 426.01	\$ 161.43
EVER	Everglades National Park	NP	2002	\$ 286.87	\$ 108.95
EVER	Everglades National Park	NP	2008	\$ 496.73	\$ 111.50
FIIS	Fire Island National Seashore	NS	2008	\$ 359.52	\$ 79.34
FODO	Fort Donelson National Battlefield	NB	2007	\$ 268.53	\$ 73.35
FOLS	Fort Larned National Historic Site	NHS	2009	\$ 540.63	\$ 121.97
FOST	Fort Stanwix NM	NM	2003	\$ 872.18	\$ 266.25
FOSU	Fort Sumter National Monument	NM	2005	\$ 329.59	\$ 94.36
GATE	Gateway National Recreation Area - Floyd Bennett Field Visitor Study	NRA	2003		
GEWA	George Washington Birthplace National Monument	NM	2004	\$ 197.67	\$ 71.77
GLCA	Glen Canyon National Recreation Area	NRA	2007	\$ 276.11	\$ 71.61
GOSP	Golden Spike National Historic Site	NHS	2006	\$ 579.08	\$ 173.89
GRSA	Great Sand Dunes National Monumnet & Preserve	NM	2002	\$ 291.92	\$ 86.67
GRSM	Great Smoky Mountains National Park	NP	1996	\$ 114.85	\$ 39.93
HALE	Haleakala National Park (Summit)	NP	2000		
HOFU	Hopewell Furnace National Historic Site	NHS	2002	\$ 419.00	\$ 147.97
HOME	Homestead National Monument of America	NM	2009	\$ 515.87	\$ 130.68
INDE	Independence National Historical Park	NHP	2007	\$ 671.75	\$ 164.88
INDU	Indiana Dunes National Lakeshore	NL	2009	\$ 218.29	\$ 49.97
JELA	Jean Lafitte National Historical Park & Preserve	OTHER	1998	\$ 299.76	\$ 93.78
JOFI	John F. Kennedy National Historic Site	NHS	2006		

PARK	PARKNAME	TYPE	YEAR	NEV/ PERSON / TRIP Full IRS Rate	NEV/ PERSON / TRIP IRS Charity Rate
JOFL	Johnstown Flood National Memorial	NMEM	2005	\$ 759.91	\$ 214.37
KATM	Katmai National Park & Preserve	NP	2006		
KIMO	Kings Mountain National Military Park	NMP	2006	\$ 336.70	\$ 95.89
KLSE	Klondike Gold Rush National Historic Site	NHS	2009	\$ 495.71	\$ 88.29
KNRI	Knife River Indian Village NHS	NHS	2003	\$ 303.36	\$ 109.46
LIBO	Lincoln Boyhood Home National Memorial	NMEM	1997	\$ 586.94	\$ 188.67
LIHO	Lincoln Home National Historic Site	NHS	2005	\$ 398.60	\$ 63.69
LOWE	Lowell National Historical Park	NHP	1997	\$ 373.10	\$ 120.23
MANZ	Manzanar National Historic Site	NHS	2004	\$ 360.21	\$ 190.23
MORA	Mount Rainier National Park	NP	2000	\$ 483.23	\$ 79.40
MORU	Mount Rushmore National Memorial	NMEM	2007	\$ 389.26	\$ 63.44
NECA	Iwo Jima/Netherlands Carillon Memorials	MEM	1998	\$ 259.55	\$ 51.59
NERI	New River Gorge National River	NR	2004	\$ 202.29	\$ 152.11
OLYM	Olympic National Park	NP	2000	\$ 414.15	\$ 134.57
PINN	Pinnacles National Monument	NM	2002	\$ 465.39	\$ 45.49
PIRO	Pictured Rocks National Lakeshore	NL	2001	\$ 145.91	\$ 264.09
RABR	Rainbow Bridge National Monument	NM	2007		
SAAN	San Antonio Missions National Historical Park	NHP	1994	\$ 170.09	\$ 53.91
SAFR	San Francisco Maritime National Historical Park	NHP	1995	\$ 449.97	\$ 208.85
SAFR	San Francisco Maritime National Historical Park	NHP	2005	\$ 744.10	\$ 182.00
SAGA	Saint-Gaudens National Historic Site	NHS	2004	\$ 893.16	\$ 325.18
SEKI	Sequoia & Kings Canyon National Parks and Sequoia National Forest	NP	2001	\$ 366.75	\$ 123.44
SHEN	Shenandoah National Park	NP	2001	\$ 204.49	\$ 71.13
SLBE	Sleeping Bear Dunes National Lakeshore	NL	2009	\$ 338.00	\$ 65.71
STRI	Stones River National Battlefield	NB	2002	\$ 178.87	\$ 68.38
USAR	USS Arizona Memorial	MEM	2000	\$ 950.91	\$ 267.57
VOYA	Voyageurs National Park	NP	1997	\$ 251.33	\$ 88.41
YELL	Yellowstone National Park	NP	2006	\$ 527.29	\$ 127.17
YOSE	Yosemite National Park	NP	2005	\$ 515.81	\$ 152.72
YOSE	Yosemite National Park	NP	2008	\$ 493.07	\$ 106.96
YOSE	Yosemite National Park	NP	2009	\$ 673.61	\$ 134.08

Note: Shaded cells are based on either small sample sizes or insignificant parameter estimates.

TABLE 31. SENSITIVITY ANALYSIS: FULL ESTIMATED MODELS FOR ALL ESTIMATED NPS UNITS-FULL IRS REIMBURSEMENT RATE.

PARK	YEAR	Parameter	Estimate	Standard Error	DF	t Value	Probt
ACAD	2009	B0	-7.95531	0.150323	723	(52.9216)	0.000
ACAD	2009	B1	-0.00268	0.000147	723	(18.2094)	0.000
ACAD	2009	B2	-0.02961	0.013338	723	(2.2204)	0.027
ACAD	2009	B3	0.001888	0.002909	723	0.6492	0.516
ACAD	2009	alpha	74456.46	2.02E-06	723	36,879,514,751.0123	-
BISC	2001	B0	-5.98875	0.288128	273	(20.7850)	0.000
BISC	2001	B1	-0.00538	0.00039	273	(13.7857)	0.000
BISC	2001	B2	0.043336	0.033265	273	1.3028	0.194
BISC	2001	B3	-0.00449	0.005877	273	(0.7645)	0.445
BISC	2001	alpha	17920.65	1.61E-05	273	1,114,664,255.0848	-
BRCA	1997	B0	1.722923	0.213471	208	8.0710	0.000
BRCA	1997	B1	-0.00249	0.000263	208	(9.4426)	0.000
BRCA	1997	B2	0.016287	0.024848	208	0.6554	0.513
BRCA	1997	B3	-0.00613	0.003773	208	(1.6249)	0.106
BRCA	1997	alpha	8.1E-05	0.034388	208	0.0024	0.998
CATO	2002	B0	-7.91026	0.259737	371	(30.4549)	0.000
CATO	2002	B1	-0.00326	0.000634	371	(5.1361)	0.000
CATO	2002	B2	-0.0775	0.027046	371	(2.8655)	0.004
CATO	2002	B3	-8.7E-05	0.004224	371	(0.0205)	0.984
CATO	2002	alpha	38898.65	6.68E-06	371	5,825,674,993.6879	-
CHAT	1998	B0	-6.55475	0.1984	494	(33.0381)	0.000
CHAT	1998	B1	-0.00661	0.000809	494	(8.1713)	0.000
CHAT	1998	B2	-0.01619	0.023495	494	(0.6890)	0.491
CHAT	1998	B3	0.009285	0.004091	494	2.2697	0.024
CHAT	1998	alpha	25921.82	7.65E-06	494	3,386,927,041.0806	-
CHOH	2003	B0	-8.60193	0.185571	509	(46.3538)	0.000
CHOH	2003	B1	-0.00235	0.000285	509	(8.2311)	0.000
CHOH	2003	B2	0.073853	0.015448	509	4.7808	0.000
CHOH	2003	B3	0.00599	0.003709	509	1.6148	0.107
CHOH	2003	alpha	59968.05	3.09E-06	509	19,379,198,737.9201	-
COLO	2001	B0	0.823979	0.17774	364	4.6359	0.000
COLO	2001	B1	-0.0015	0.000198	364	(7.5832)	0.000
COLO	2001	B2	0.016683	0.016823	364	0.9917	0.322
COLO	2001	B3	0.006373	0.003066	364	2.0789	0.038
COLO	2001	alpha	0.160678	0.040823	364	3.9359	0.000
COWP	2003	B0	-6.82038	0.337389	221	(20.2152)	0.000
COWP	2003	B1	-0.0085	0.001167	221	(7.2827)	0.000
COWP	2003	B2	-0.18125	0.062791	221	(2.8866)	0.004
COWP	2003	B3	-0.01706	0.005314	221	(3.2102)	0.002
COWP	2003	alpha	97771.71	3.45E-06	221	28,333,429,580.7517	-
CRLA	2001	B0	0.746708	0.202496	372	3.6875	0.000
CRLA	2001	B1	-0.00178	0.000193	372	(9.2161)	0.000
CRLA	2001	B2	-0.02473	0.020771	372	(1.1904)	0.235
CRLA	2001	B3	0.00763	0.00325	372	2.3477	0.019

CRLA	2001	alpha	0.339993	0.072863	372	4.6662	0.000
CRMO	2004	B0	1.345678	0.230538	284	5.8371	0.000
CRMO	2004	B1	-0.00208	0.00022	284	(9.4633)	0.000
CRMO	2004	B2	0.027416	0.021048	284	1.3026	0.194
CRMO	2004	B3	-0.00638	0.003852	284	(1.6552)	0.099
CRMO	2004	alpha	0.179911	0.052	284	3.4598	0.001
CUIS	1998	B0	0.184011	0.402241	198	0.4575	0.648
CUIS	1998	B1	-0.00431	0.00069	198	(6.2521)	0.000
CUIS	1998	B2	-0.01643	0.050034	198	(0.3283)	0.743
CUIS	1998	B3	0.011666	0.005193	198	2.2466	0.026
CUIS	1998	alpha	1.342499	0.4599	198	2.9191	0.004
CUVA	2005	B0	1.832417	0.115495	762	15.8658	0.000
CUVA	2005	B1	-0.00245	0.000438	762	(5.6098)	0.000
CUVA	2005	B2	0.018412	0.010731	762	1.7159	0.087
CUVA	2005	B3	-0.00426	0.001844	762	(2.3112)	0.021
CUVA	2005	alpha	0.320152	0.033328	762	9.6060	0.000
DRTO	2002	B0	1.165532	0.22372	257	5.2098	0.000
DRTO	2002	B1	-0.00189	0.000217	257	(8.7087)	0.000
DRTO	2002	B2	-0.00314	0.018321	257	(0.1712)	0.864
DRTO	2002	B3	0.003457	0.003954	257	0.8743	0.383
DRTO	2002	alpha	0.19251	0.058007	257	3.3188	0.001
EBLA	2007	B0	-7.47833	0.374911	251	(19.9470)	0.000
EBLA	2007	B1	-0.00079	0.000148	251	(5.3640)	0.000
EBLA	2007	B2	-0.09309	0.040355	251	(2.3069)	0.022
EBLA	2007	B3	0.000877	0.005506	251	0.1594	0.874
EBLA	2007	alpha	35485.4	1.06E-05	251	3,358,798,544.7747	-
EFMO	2004	B0	0.543919	0.436951	234	1.2448	0.214
EFMO	2004	B1	-0.00451	0.000654	234	(6.8890)	0.000
EFMO	2004	B2	-0.03805	0.038662	234	(0.9843)	0.326
EFMO	2004	B3	0.002804	0.006082	234	0.4610	0.645
EFMO	2004	alpha	1.955146	0.746314	234	2.6197	0.009
EVER	2002	B0	-7.78168	0.247954	442	(31.3836)	0.000
EVER	2002	B1	-0.00349	0.000197	442	(17.6699)	0.000
EVER	2002	B2	-0.01883	0.029854	442	(0.6308)	0.528
EVER	2002	B3	0.013384	0.004118	442	3.2497	0.001
EVER	2002	alpha	23153.82	1.07E-05	442	2,162,176,155.9069	-
EVER	2008	B0	-1.84585	2.890941	517	(0.6385)	0.523
EVER	2008	B1	-0.00201	0.000122	517	(16.5665)	0.000
EVER	2008	B2	-0.0186	0.020216	517	(0.9202)	0.358
EVER	2008	B3	-0.00348	0.003986	517	(0.8735)	0.383
EVER	2008	alpha	123.49	358.4394	517	0.3445	0.731
FIIS	2008	B0	-8.79992	0.250755	575	(35.0937)	0.000
FIIS	2008	B1	-0.00278	0.00026	575	(10.6991)	0.000
FIIS	2008	B2	0.059048	0.019372	575	3.0481	0.002
FIIS	2008	B3	0.007083	0.003908	575	1.8125	0.070
FIIS	2008	alpha	76747.47	3.27E-06	575	23,490,003,817.5275	-
FOLS	2009	B0	0.976428	0.267992	241	3.6435	0.000
FOLS	2009	B1	-0.00185	0.000246	241	(7.5206)	0.000

FOLS	2009	B2	-0.0147	0.024987	241	(0.5885)	0.557
FOLS	2009	B3	0.000173	0.003936	241	0.0439	0.965
FOLS	2009	alpha	0.165139	0.067709	241	2.4390	0.015
FOST	2003	B0	0.703482	0.327775	159	2.1462	0.033
FOST	2003	B1	-0.00115	0.000395	159	(2.9002)	0.004
FOST	2003	B2	0.013857	0.042499	159	0.3260	0.745
FOST	2003	B3	-0.0002	0.004798	159	(0.0425)	0.966
FOST	2003	alpha	0.608311	0.192404	159	3.1616	0.002
FOSU	2005	B0	1.309719	0.2014	286	6.5031	0.000
FOSU	2005	B1	-0.00303	0.00039	286	(7.7883)	0.000
FOSU	2005	B2	0.007155	0.018575	286	0.3852	0.700
FOSU	2005	B3	-0.00192	0.00359	286	(0.5340)	0.594
FOSU	2005	alpha	0.086284	0.039546	286	2.1819	0.030
GATE	2003	B0	-6.11068	0.261011	288	(23.4116)	0.000
GATE	2003	B1	-0.00137	0.000903	288	(1.5140)	0.131
GATE	2003	B2	-0.11099	0.039633	288	(2.8004)	0.005
GATE	2003	B3	0.009674	0.004165	288	2.3228	0.021
GATE	2003	alpha	28858.2	9.04E-06	288	3,190,764,485.5588	-
GEWA	2004	B0	-7.17504	0.437159	157	(16.4129)	0.000
GEWA	2004	B1	-0.00506	0.000905	157	(5.5932)	0.000
GEWA	2004	B2	-0.14172	0.037715	157	(3.7578)	0.000
GEWA	2004	B3	-0.00944	0.008029	157	(1.1763)	0.241
GEWA	2004	alpha	40000.77	1.09E-05	157	3,660,213,887.0152	-
GLCA	2007	B0	-6.20374	0.270098	362	(22.9685)	0.000
GLCA	2007	B1	-0.00362	0.000253	362	(14.3132)	0.000
GLCA	2007	B2	-0.00484	0.022635	362	(0.2140)	0.831
GLCA	2007	B3	0.017103	0.004973	362	3.4389	0.001
GLCA	2007	alpha	4463.232	6.05E-05	362	73,767,845.7294	-
GOSP	2006	B0	0.681752	0.328953	230	2.0725	0.039
GOSP	2006	B1	-0.00173	0.000209	230	(8.2665)	0.000
GOSP	2006	B2	0.045374	0.02742	230	1.6547	0.099
GOSP	2006	B3	-0.00325	0.004538	230	(0.7153)	0.475
GOSP	2006	alpha	0.967641	0.27895	230	3.4689	0.001
GRSA	2002	B0	0.867162	0.244942	246	3.5403	0.000
GRSA	2002	B1	-0.00343	0.000379	246	(9.0343)	0.000
GRSA	2002	B2	0.042267	0.024959	246	1.6934	0.092
GRSA	2002	B3	0.005168	0.00453	246	1.1408	0.255
GRSA	2002	alpha	0.532841	0.125892	246	4.2325	0.000
HALE	2000	B0	2.184029	1.251437	25	1.7452	0.093
HALE	2000	B1	-0.04013	0.050207	25	(0.7992)	0.432
HALE	2000	B2	-0.07188	0.187944	25	(0.3824)	0.705
HALE	2000	B3	-0.00301	0.01393	25	(0.2162)	0.831
HALE	2000	alpha	1.452857	1.106342	25	1.3132	0.201
HOFU	2002	B0	0.451306	0.432114	200	1.0444	0.298
HOFU	2002	B1	-0.00239	0.000691	200	(3.4530)	0.001
HOFU	2002	B2	-0.0322	0.04053	200	(0.7945)	0.428
HOFU	2002	B3	0.003246	0.005852	200	0.5546	0.580
HOFU	2002	alpha	1.930371	0.715134	200	2.6993	0.008

HOME	2009	B0	0.451659	0.642839	233	0.7026	0.483
HOME	2009	B1	-0.00194	0.00028	233	(6.9336)	0.000
HOME	2009	B2	-0.07148	0.038155	233	(1.8735)	0.062
HOME	2009	B3	-0.00329	0.004942	233	(0.6655)	0.506
HOME	2009	alpha	4.492939	2.869643	233	1.5657	0.119
INDE	2007	B0	1.440112	0.183871	584	7.8322	0.000
INDE	2007	B1	-0.00149	0.00013	584	(11.4496)	0.000
INDE	2007	B2	-0.01296	0.014417	584	(0.8986)	0.369
INDE	2007	B3	-0.00842	0.003174	584	(2.6521)	0.008
INDE	2007	alpha	0.966778	0.15387	584	6.2831	0.000
INDU	2009	B0	-7.46767	0.23171	457	(32.2285)	0.000
INDU	2009	B1	-0.00458	0.000532	457	(8.6184)	0.000
INDU	2009	B2	-0.04856	0.022503	457	(2.1580)	0.031
INDU	2009	B3	-0.00603	0.003866	457	(1.5597)	0.120
INDU	2009	alpha	46308.09	5E-06	457	9,255,021,599.7365	-
JOFI	2006	B0	0.248002	0.229333	234	1.0814	0.281
JOFI	2006	B1	-0.00014	0.000143	234	(0.9654)	0.335
JOFI	2006	B2	0.006125	0.023032	234	0.2659	0.791
JOFI	2006	B3	-0.00135	0.004272	234	(0.3162)	0.752
JOFI	2006	alpha	9E-08	7.26E-05	234	0.0012	0.999
JOFL	2005	B0	1.656356	0.886658	157	1.8681	0.064
JOFL	2005	B1	-0.00132	0.000578	157	(2.2750)	0.024
JOFL	2005	B2	-0.23562	0.046748	157	(5.0402)	0.000
JOFL	2005	B3	-0.02077	0.007597	157	(2.7335)	0.007
JOFL	2005	alpha	5.693719	5.26116	157	1.0822	0.281
KATM	2006	B0	1.697406	0.048027	3	35.3431	0.000
KATM	2006	B1	-0.0026	0	3		-
KATM	2006	B2	-0.80315	0.316007	3	(2.5416)	0.085
KATM	2006	B3	0.107115	0.040874	3	2.6206	0.079
KATM	2006	alpha	5.67E-09		3		
KIMO	2006	B0	-0.49572	2.6994	200	(0.1836)	0.854
KIMO	2006	B1	-0.00297	0.000478	200	(6.2188)	0.000
KIMO	2006	B2	-0.15007	0.049356	200	(3.0406)	0.003
KIMO	2006	B3	0.000237	0.006076	200	0.0389	0.969
KIMO	2006	alpha	22.17996	62.01981	200	0.3576	0.721
KLSE	2009	B0	-10.8207	0.605428	193	(17.8729)	0.000
KLSE	2009	B1	-0.00202	0.000299	193	(6.7401)	0.000
KLSE	2009	B2	-0.06348	0.062323	193	(1.0186)	0.310
KLSE	2009	B3	-0.01015	0.009247	193	(1.0974)	0.274
KLSE	2009	alpha	255972.8	2.37E-06	193	108,224,615,479.9020	-
KNRI	2003	B0	1.079099	0.302482	207	3.5675	0.000
KNRI	2003	B1	-0.0033	0.000355	207	(9.2806)	0.000
KNRI	2003	B2	0.009415	0.041536	207	0.2267	0.821
KNRI	2003	B3	0.002136	0.005117	207	0.4175	0.677
KNRI	2003	alpha	0.405606	0.115958	207	3.4979	0.001
LIBO	1997	B0	0.187947	0.366534	324	0.5128	0.608
LIBO	1997	B1	-0.0017	0.000444	324	(3.8393)	0.000
LIBO	1997	B2	0.061437	0.042315	324	1.4519	0.147

LIBO	1997	B3	-0.00221	0.004567	324	(0.4833)	0.629
LIBO	1997	alpha	2.56944	0.8599	324	2.9881	0.003
LIHO	2005	B0	1.612233	0.203236	329	7.9328	0.000
LIHO	2005	B1	-0.00251	0.000377	329	(6.6560)	0.000
LIHO	2005	B2	-0.02325	0.020644	329	(1.1263)	0.261
LIHO	2005	B3	-0.00873	0.003177	329	(2.7479)	0.006
LIHO	2005	alpha	0.101442	0.041767	329	2.4287	0.016
LOWE	1997	B0	-0.26723	0.752476	332	(0.3551)	0.723
LOWE	1997	B1	-0.00268	0.000324	332	(8.2712)	0.000
LOWE	1997	B2	-0.03069	0.031406	332	(0.9773)	0.329
LOWE	1997	B3	-0.00039	0.004955	332	(0.0789)	0.937
LOWE	1997	alpha	7.229443	5.554628	332	1.3015	0.194
MANZ	2004	B0	0.512849	0.299235	218	1.7139	0.088
MANZ	2004	B1	-0.00278	0.00054	218	(5.1388)	0.000
MANZ	2004	B2	0.011156	0.021904	218	0.5093	0.611
MANZ	2004	B3	0.0065	0.0047	218	1.3831	0.168
MANZ	2004	alpha	0.370818	0.112276	218	3.3027	0.001
MORU	2007	B0	1.880896	0.134071	435	14.0291	0.000
MORU	2007	B1	-0.00257	0.000183	435	(14.0545)	0.000
MORU	2007	B2	-0.00222	0.012526	435	(0.1772)	0.859
MORU	2007	B3	-0.00106	0.002575	435	(0.4104)	0.682
MORU	2007	alpha	0.086818	0.023444	435	3.7032	0.000
NECA	1998	B0	-7.84373	0.287029	300	(27.3274)	0.000
NECA	1998	B1	-0.00385	0.000341	300	(11.2894)	0.000
NECA	1998	B2	0.054291	0.031538	300	1.7214	0.086
NECA	1998	B3	0.00268	0.00507	300	0.5286	0.597
NECA	1998	alpha	23617.02	1.22E-05	300	1,943,316,862.1293	-
NERI	2004	B0	-5.07161	0.222405	353	(22.8035)	0.000
NERI	2004	B1	-0.00494	0.000647	353	(7.6404)	0.000
NERI	2004	B2	-0.19424	0.030441	353	(6.3808)	0.000
NERI	2004	B3	-0.03568	0.003846	353	(9.2763)	0.000
NERI	2004	alpha	24421.28	9.11E-06	353	2,681,693,507.5820	-
OLYM	2000	B0	0.997541	0.336686	701	2.9628	0.003
OLYM	2000	B1	-0.00241	0.000143	701	(16.9175)	0.000
OLYM	2000	B2	-0.09204	0.023078	701	(3.9882)	0.000
OLYM	2000	B3	-0.00162	0.002761	701	(0.5884)	0.556
OLYM	2000	alpha	4.681509	1.592028	701	2.9406	0.003
PINN	2002	B0	0.466362	0.522817	323	0.8920	0.373
PINN	2002	B1	-0.00215	0.000471	323	(4.5639)	0.000
PINN	2002	B2	-0.06172	0.023245	323	(2.6552)	0.008
PINN	2002	B3	-0.00622	0.004946	323	(1.2577)	0.209
PINN	2002	alpha	4.636619	2.521157	323	1.8391	0.067
PIRO	2001	B0	0.808032	0.356617	382	2.2658	0.024
PIRO	2001	B1	-0.00685	0.000556	382	(12.3248)	0.000
PIRO	2001	B2	-0.07977	0.029391	382	(2.7142)	0.007
PIRO	2001	B3	0.012326	0.00467	382	2.6397	0.009
PIRO	2001	alpha	2.525707	0.792104	382	3.1886	0.002
RABR	2007	B0	1.9049	0.262716	132	7.2508	0.000

RABR	2007	B1	-0.00061	0.000201	132	(3.0143)	0.003
RABR	2007	B2	-0.02217	0.020683	132	(1.0720)	0.286
RABR	2007	B3	-0.00247	0.004411	132	(0.5601)	0.576
RABR	2007	alpha	0.308496	0.086324	132	3.5737	0.000
SAFR	2005	B0	0.847798	0.258622	301	3.2781	0.001
SAFR	2005	B1	-0.00134	0.000124	301	(10.8028)	0.000
SAFR	2005	B2	-0.0417	0.019647	301	(2.1224)	0.035
SAFR	2005	B3	0.007753	0.004174	301	1.8577	0.064
SAFR	2005	alpha	0.853543	0.205718	301	4.1491	0.000
SAGA	2004	B0	-0.44057	0.400101	169	(1.1012)	0.272
SAGA	2004	B1	-0.00112	0.000376	169	(2.9802)	0.003
SAGA	2004	B2	-0.02296	0.025705	169	(0.8932)	0.373
SAGA	2004	B3	0.02007	0.005404	169	3.7141	0.000
SAGA	2004	alpha	1.277427	0.457002	169	2.7952	0.006
SEKI	2001	B0	0.249972	0.764782	388	0.3269	0.744
SEKI	2001	B1	-0.00273	0.000233	388	(11.7076)	0.000
SEKI	2001	B2	-0.14523	0.025644	388	(5.6633)	0.000
SEKI	2001	B3	0.010404	0.004191	388	2.4824	0.013
SEKI	2001	alpha	9.215276	7.364616	388	1.2513	0.212
SHEN	2001	B0	-3.834	2.297102	513	(1.6691)	0.096
SHEN	2001	B1	-0.00489	0.00044	513	(11.1170)	0.000
SHEN	2001	B2	-0.10986	0.022466	513	(4.8901)	0.000
SHEN	2001	B3	-0.00388	0.004362	513	(0.8904)	0.374
SHEN	2001	alpha	867.5328	1983.967	513	0.4373	0.662
SLBE	2009	B0	-7.26315	0.205742	626	(35.3023)	0.000
SLBE	2009	B1	-0.00296	0.000239	626	(12.4027)	0.000
SLBE	2009	B2	-0.08493	0.015814	626	(5.3705)	0.000
SLBE	2009	B3	0.001235	0.003559	626	0.3470	0.729
SLBE	2009	alpha	26027.42	7.9E-06	626	3,292,724,597.4773	-
STRI	2002	B0	-0.78038	1.016678	225	(0.7676)	0.444
STRI	2002	B1	-0.00559	0.000592	225	(9.4467)	0.000
STRI	2002	B2	0.013069	0.051257	225	0.2550	0.799
STRI	2002	B3	0.011504	0.006472	225	1.7776	0.077
STRI	2002	alpha	7.698747	8.185092	225	0.9406	0.348
USAR	2000	B0	1.483597	0.157058	271	9.4462	0.000
USAR	2000	B1	-0.00105	7.84E-05	271	(13.4094)	0.000
USAR	2000	B2	0.011651	0.015621	271	0.7459	0.456
USAR	2000	B3	0.008164	0.00278	271	2.9365	0.004
USAR	2000	alpha	1.22E-09	2.06E-06	271	0.0006	1.000
VOYA	1997	B0	-7.69391	0.195569	542	(39.3412)	0.000
VOYA	1997	B1	-0.00398	0.00029	542	(13.7045)	0.000
VOYA	1997	B2	-0.08273	0.032255	542	(2.5648)	0.011
VOYA	1997	B3	-0.00387	0.003852	542	(1.0035)	0.316
VOYA	1997	alpha	69248.93	2.82E-06	542	24,520,695,565.0506	-
YOSE	2005	B0	0.884705	0.222649	511	3.9735	0.000
YOSE	2005	B1	-0.00194	0.000148	511	(13.1046)	0.000
YOSE	2005	B2	0.005793	0.014999	511	0.3862	0.699
YOSE	2005	B3	0.002204	0.00321	511	0.6868	0.493

YOSE	2005	alpha	1.303262	0.245827	511	5.3015	0.000
YOSE	2008	B0	1.554433	0.278816	382	5.5751	0.000
YOSE	2008	B1	-0.00203	0.000227	382	(8.9312)	0.000
YOSE	2008	B2	-0.04792	0.01728	382	(2.7729)	0.006
YOSE	2008	B3	-0.00375	0.003643	382	(1.0288)	0.304
YOSE	2008	alpha	2.047401	0.528813	382	3.8717	0.000
YOSE	2009	B0	1.532694	0.21919	462	6.9925	0.000
YOSE	2009	B1	-0.00148	0.000111	462	(13.4000)	0.000
YOSE	2009	B2	-0.02505	0.014474	462	(1.7310)	0.084
YOSE	2009	B3	-0.00483	0.002978	462	(1.6231)	0.105
YOSE	2009	alpha	1.305678	0.257768	462	5.0653	0.000

TABLE 32. SENSITIVITY ANALYSIS: SET OF PARKS WITH PRIMARY PURPOSE DATA, KEY PARAMETERS-FULL IRS REIMBURSEMENT RATE.

PARKNAME	YEAR	VARIABLE	COEFFICIENT	T-STAT	DF	PROBT
C & O Canal National Historical Park	2003	TC	-0.002	-6.70	497	5.7E-11
C & O Canal National Historical Park	2003	Primary * TC	0.001	1.50	497	1.3E-01*
Cowpens National Battlefield	2003	TC	-0.003	-3.90	215	1.3E-04
Cowpens National Battlefield	2003	Primary * TC	-0.011	-2.20	215	2.9E-02
Ebey's Landing National Historical Reserve	2007	TC	0.000	-2.68	242	7.9E-03
Ebey's Landing National Historical Reserve	2007	Primary * TC	-0.002	-2.41	242	1.6E-02
Effigy Mounds National Monument	2004	TC	-0.003	-5.40	232	1.6E-07
Effigy Mounds National Monument	2004	Primary * TC	-0.014	-3.08	232	2.3E-03
Fort Larned National Historic Site	2009	TC	-0.001	-5.42	241	1.5E-07
Fort Larned National Historic Site	2009	Primary * TC	-0.001	-1.01	241	3.1E-01
Great Sand Dunes National Monumnet & Preserve	2002	TC	-0.003	-7.63	245	5.1E-13
Great Sand Dunes National Monumnet & Preserve	2002	Primary * TC	-0.001	-0.42	245	6.8E-01
Haleakala National Park (Summit)	2000	TC	0.095	1.11	25	2.8E-01
Haleakala National Park (Summit)	2000	Primary * TC	-0.253	-1.85	25	7.6E-02
Hopewell Furnace National Historic Site	2002	TC	-0.002	-2.41	197	1.7E-02
Hopewell Furnace National Historic Site	2002	Primary * TC	-0.001	-0.45	197	6.5E-01
Independence National Historical Park	2007	TC	-0.001	-9.06	579	2.0E-18
Independence National Historical Park	2007	Primary * TC	0.000	-1.45	579	1.5E-01
Katmai National Park & Preserve	2006	TC	-0.003		3	0.0E+00*
Katmai National Park & Preserve	2006	Primary * TC	0.000		3	0.0E+00*
Kings Mountain National Military Park	2006	TC	-0.002	-4.80	199	3.1E-06
Kings Mountain National Military Park	2006	Primary * TC	-0.001	-0.41	199	6.8E-01
Knife River Indian Village NHS	2003	TC	-0.003	-8.11	205	4.6E-14
Knife River Indian Village NHS	2003	Primary * TC	-0.004	-1.42	205	1.6E-01
Lincoln Boyhood Home National Memorial	1997	TC	-0.001	-1.31	323	1.9E-01
Lincoln Boyhood Home National Memorial	1997	Primary * TC	-0.009	-1.32	323	1.9E-01
Lowell National Historical Park	1997	TC	-0.002	-5.95	326	7.0E-09
Lowell National Historical Park	1997	Primary * TC	-0.002	-1.90	326	5.8E-02
Manzanar National Historic Site	2004	TC	-0.003	-4.92	217	1.7E-06
Manzanar National Historic Site	2004	Primary * TC	-0.001	-0.35	217	7.3E-01
Mount Rushmore National Memorial	2007	TC	-0.003	-13.50	433	6.2E-35
Mount Rushmore National Memorial	2007	Primary * TC	0.001	1.48	433	1.4E-01*
New River Gorge National River	2004	TC	-0.004	-4.84	349	1.9E-06
New River Gorge National River	2004	Primary * TC	-0.003	-2.05	349	4.1E-02
Pictured Rocks National Lakeshore	2001	TC	-0.004	-8.18	381	4.2E-15
Pictured Rocks National Lakeshore	2001	Primary * TC	-0.014	-8.42	381	7.8E-16
Shenandoah National Park	2001	TC	-0.003	-7.73	505	5.9E-14
Shenandoah National Park	2001	Primary * TC	-0.009	-5.55	505	4.5E-08
Stones River National Battlefield	2002	TC	-0.003	-5.34	216	2.3E-07
Stones River National Battlefield	2002	Primary * TC	-0.005	-2.72	216	7.1E-03

TABLE 33. SENSITIVITY ANALYSIS: SET OF PARKS WITH PRIMARY PURPOSE DATA, NEV PER TRIP ESTIMATES- FULL IRS REIMBURSEMENT RATE

PARK	PARKNAME	TYPE	REGION	YEAR	PRIMARY PURPOSE NEV/Trip	SECONDARY PURPOSE NEV/Trip
CHOH	C & O Canal National Historical Park	NHP	NCR	2003		\$ 401.13
COWP	Cowpens National Battlefield	NB	SER	2003	\$ 70.61	\$ 288.00
EBLA	Ebey's Landing National Historical Reserve	OTHER	PWR	2007	\$ 375.33	\$2,354.26
EFMO	Effigy Mounds National Monument	NM	MWR	2004	\$ 56.07	\$ 297.32
FOLS	Fort Larned National Historic Site	NHS	MWR	2009		\$ 673.98
GRSA	Great Sand Dunes National Monumnet & Preserve	NM	IMR	2002		\$ 330.37
HALE	Haleakala National Park (Summit)	NP	PWR	2000		
HOFU	Hopewell Furnace National Historic Site	NHS	NER	2002		\$ 537.74
INDE	Independence National Historical Park	NHP	NER	2007		\$ 749.86
KATM	Katmai National Park & Preserve	NP	ALR	2006		
KIMO	Kings Mountain National Military Park	NMP	SER	2006		\$ 406.01
KNRI	Knife River Indian Village NHS	NHS	MWR	2003		\$ 321.33
LIBO	Lincoln Boyhood Home National Memorial	NMEM	MWR	1997		
LOWE	Lowell National Historical Park	NHP	NER	1997	\$ 224.53	\$ 503.47
MANZ	Manzanar National Historic Site	NHS	PWR	2004		\$ 369.77
MORU	Mount Rushmore National Memorial	NMEM	MWR	2007		\$ 377.73
NERI	New River Gorge National River	NR	NER	2004	\$ 163.25	\$ 285.12
PIRO	Pictured Rocks National Lakeshore	NL	MWR	2001	\$ 53.58	\$ 239.05
SHEN	Shenandoah National Park	NP	NER	2001	\$ 82.23	\$ 300.31
STRI	Stones River National Battlefield	NB	SER	2002	\$ 121.94	\$ 340.18

Note: shaded cells not calculated due to small samples or insignificant parameter estimates.

TABLE 34. SENSITIVITY ANALYSIS: ESTIMATED MODELS FOR PARKS WITH PRIMARY PURPOSE DATA-FULL IRS REIMBURSEMENT RATE.

PARK	YEAR	Parameter	Estimate	Standard Error	DF	tValue	Probt
CHOH	2003	B0	-8.9332	0.20338	497	-43.9236	3.1E-173
CHOH	2003	B1	-0.00249	0.000372	497	-6.69883	5.7E-11
CHOH	2003	B2	0.05948	0.016067	497	3.701949	0.000238
CHOH	2003	B3	0.009908	0.003782	497	2.619699	0.00907
CHOH	2003	B4	0.671332	0.108584	497	6.182578	1.32E-09
CHOH	2003	B5	0.000883	0.000587	497	1.503745	0.133282
CHOH	2003	alpha	46895.05	4.34E-06	497	1.08E+10	0
COWP	2003	B0	-7.30751	0.346165	215	-21.1099	2.58E-54
COWP	2003	B1	-0.00347	0.00089	215	-3.89925	0.000129
COWP	2003	B2	-0.10448	0.053235	215	-1.96259	0.050984
COWP	2003	B3	-0.01762	0.005789	215	-3.04414	0.002625
COWP	2003	B4	1.920741	0.162513	215	11.81901	3.66E-25
COWP	2003	B5	-0.01069	0.004855	215	-2.20185	0.028739
COWP	2003	alpha	29344.36	1.18E-05	215	2.49E+09	0
EBLA	2007	B0	-7.65347	0.391405	242	-19.5538	1.02E-51
EBLA	2007	B1	-0.00042	0.000159	242	-2.67761	0.007922
EBLA	2007	B2	-0.01404	0.040602	242	-0.34585	0.729759
EBLA	2007	B3	-0.00056	0.005655	242	-0.09831	0.921769
EBLA	2007	B4	1.143866	0.157196	242	7.276682	4.75E-12
EBLA	2007	B5	-0.00224	0.000928	242	-2.41461	0.016495
EBLA	2007	alpha	16672.78	2.35E-05	242	7.1E+08	0
EFMO	2004	B0	0.355692	0.383629	232	0.927176	0.354799
EFMO	2004	B1	-0.00336	0.000622	232	-5.40303	1.62E-07
EFMO	2004	B2	0.01579	0.037855	232	0.417121	0.676975
EFMO	2004	B3	-5.5E-05	0.005911	232	-0.00934	0.992553
EFMO	2004	B4	1.185279	0.215002	232	5.512878	9.38E-08
EFMO	2004	B5	-0.01447	0.004701	232	-3.07856	0.00233
EFMO	2004	alpha	1.229871	0.378425	232	3.249972	0.001325
FOLS	2009	B0	0.772635	0.277551	241	2.783759	0.0058
FOLS	2009	B1	-0.00148	0.000274	241	-5.4185	1.46E-07
FOLS	2009	B2	-0.00278	0.025413	241	-0.10924	0.913103
FOLS	2009	B3	-0.00019	0.003892	241	-0.04801	0.961747
FOLS	2009	B4	0.392131	0.146998	241	2.667594	0.008158
FOLS	2009	B5	-0.001	0.00099	241	-1.01235	0.312388
FOLS	2009	alpha	0.143939	0.062585	241	2.299903	0.022309
GRSA	2002	B0	0.600161	0.267767	245	2.241353	0.025899
GRSA	2002	B1	-0.00303	0.000396	245	-7.63467	5.05E-13
GRSA	2002	B2	0.048445	0.025753	245	1.881176	0.061134
GRSA	2002	B3	0.007712	0.004597	245	1.677633	0.094694
GRSA	2002	B4	0.421122	0.172748	245	2.437778	0.01549
GRSA	2002	B5	-0.00066	0.001591	245	-0.41601	0.677766
GRSA	2002	alpha	0.487712	0.115246	245	4.231928	3.28E-05
HALE	2000	B0	0.322757	1.188307	25	0.271611	0.788152

HALE	2000	B1	0.094648	0.085198	25	1.110921	0.277173
HALE	2000	B2	0.22222	0.176443	25	1.259448	0.219501
HALE	2000	B3	-0.01793	0.016421	25	-1.09211	0.2852
HALE	2000	B4	2.497567	1.029518	25	2.425956	0.022818
HALE	2000	B5	-0.25318	0.136961	25	-1.84859	0.076379
HALE	2000	alpha	0.748328	0.445594	25	1.679394	0.105532
HOFU	2002	B0	0.634188	0.401397	197	1.579951	0.115722
HOFU	2002	B1	-0.00186	0.000772	197	-2.4088	0.016926
HOFU	2002	B2	-0.0256	0.039206	197	-0.65293	0.514565
HOFU	2002	B3	-0.00403	0.005964	197	-0.67562	0.500073
HOFU	2002	B4	0.496486	0.145302	197	3.416928	0.000769
HOFU	2002	B5	-0.00067	0.001501	197	-0.44932	0.653694
HOFU	2002	alpha	1.51164	0.498035	197	3.035206	0.002728
INDE	2007	B0	1.382071	0.179949	579	7.680355	6.8E-14
INDE	2007	B1	-0.00133	0.000147	579	-9.05784	2.03E-18
INDE	2007	B2	-0.00717	0.014246	579	-0.50348	0.614821
INDE	2007	B3	-0.00878	0.003119	579	-2.81411	0.005058
INDE	2007	B4	0.218182	0.096153	579	2.269101	0.023629
INDE	2007	B5	-0.00043	0.000294	579	-1.45313	0.146729
INDE	2007	alpha	0.861683	0.13361	579	6.449224	2.37E-10
KATM	2006	B0	-0.20224	1.384902	3	-0.14603	0.893158
KATM	2006	B1	-0.0026	0	3		0
KATM	2006	B2	-13.3025	9.112618	3	-1.45979	0.240461
KATM	2006	B3	1.609433	1.095415	3	1.469245	0.238097
KATM	2006	B4	18.52474	13.33759	3	1.388912	0.259008
KATM	2006	B5	0.0001	0	3		0
KATM	2006	alpha	2.77E-08		3		
KIMO	2006	B0	-0.3457	1.592156	199	-0.21713	0.828331
KIMO	2006	B1	-0.00246	0.000513	199	-4.80411	3.05E-06
KIMO	2006	B2	-0.15432	0.049278	199	-3.13172	0.002
KIMO	2006	B3	0.002376	0.00611	199	0.388876	0.697784
KIMO	2006	B4	0.481254	0.173006	199	2.781727	0.005927
KIMO	2006	B5	-0.00053	0.001286	199	-0.41011	0.682167
KIMO	2006	alpha	12.70024	21.10643	199	0.601724	0.548043
KNRI	2003	B0	1.004877	0.308463	205	3.257688	0.001315
KNRI	2003	B1	-0.00311	0.000384	205	-8.10978	4.57E-14
KNRI	2003	B2	0.014884	0.041573	205	0.358023	0.720694
KNRI	2003	B3	0.002101	0.005152	205	0.407886	0.683783
KNRI	2003	B4	0.283578	0.191712	205	1.479188	0.140625
KNRI	2003	B5	-0.0042	0.002954	205	-1.42248	0.156406
KNRI	2003	alpha	0.388034	0.112717	205	3.442541	0.000698
LIBO	1997	B0	0.372384	0.298426	323	1.247827	0.212998
LIBO	1997	B1	-0.0006	0.000461	323	-1.30806	0.191783
LIBO	1997	B2	0.044392	0.039009	323	1.137987	0.255969
LIBO	1997	B3	-0.00369	0.004378	323	-0.84199	0.400414

LIBO	1997	B4	0.82541	0.142527	323	5.791274	1.66E-08
LIBO	1997	B5	-0.00872	0.006588	323	-1.32318	0.186712
LIBO	1997	alpha	1.512322	0.404502	323	3.738728	0.000219
LOWE	1997	B0	-0.18461	0.479368	326	-0.38511	0.700404
LOWE	1997	B1	-0.00199	0.000334	326	-5.94909	6.95E-09
LOWE	1997	B2	-0.01707	0.03031	326	-0.5632	0.573686
LOWE	1997	B3	0.001374	0.004827	326	0.284547	0.776172
LOWE	1997	B4	0.472743	0.134173	326	3.523394	0.000487
LOWE	1997	B5	-0.00247	0.0013	326	-1.89866	0.058491
LOWE	1997	alpha	3.579961	1.609651	326	2.22406	0.026829
MANZ	2004	B0	0.42701	0.309645	217	1.379032	0.169305
MANZ	2004	B1	-0.0027	0.00055	217	-4.91652	1.74E-06
MANZ	2004	B2	0.01769	0.022585	217	0.783247	0.434336
MANZ	2004	B3	0.007221	0.004779	217	1.510881	0.132273
MANZ	2004	B4	0.349616	0.338876	217	1.031693	0.303364
MANZ	2004	B5	-0.00075	0.002134	217	-0.35142	0.725611
MANZ	2004	alpha	0.364427	0.110533	217	3.297002	0.001142
MORU	2007	B0	1.918482	0.1376	433	13.94245	9.29E-37
MORU	2007	B1	-0.00265	0.000196	433	-13.505	6.23E-35
MORU	2007	B2	-0.00438	0.012596	433	-0.34775	0.728198
MORU	2007	B3	-0.00146	0.002583	433	-0.56566	0.571915
MORU	2007	B4	-0.08366	0.132718	433	-0.63034	0.528804
MORU	2007	B5	0.000713	0.000483	433	1.475151	0.140899
MORU	2007	alpha	0.085714	0.023335	433	3.673106	0.00027
NERI	2004	B0	-5.08923	6.23074	349	-0.81679	0.414603
NERI	2004	B1	-0.00351	0.000725	349	-4.84069	1.95E-06
NERI	2004	B2	-0.1477	0.031055	349	-4.756	2.89E-06
NERI	2004	B3	-0.02579	0.004377	349	-5.89224	8.98E-09
NERI	2004	B4	0.969791	0.148419	349	6.534154	2.27E-10
NERI	2004	B5	-0.00262	0.001279	349	-2.04691	0.041416
NERI	2004	alpha	7156.632	44551.47	349	0.160637	0.872472
PIRO	2001	B0	0.595737	0.271612	381	2.193338	0.028887
PIRO	2001	B1	-0.00418	0.000511	381	-8.18292	4.2E-15
PIRO	2001	B2	-0.0077	0.026604	381	-0.28946	0.772388
PIRO	2001	B3	0.008947	0.004163	381	2.149303	0.03224
PIRO	2001	B4	1.576461	0.143722	381	10.96886	1.63E-24
PIRO	2001	B5	-0.01448	0.00172	381	-8.4192	7.79E-16
PIRO	2001	alpha	0.962135	0.18825	381	5.11095	5.08E-07
SHEN	2001	B0	0.208197	0.666949	505	0.312163	0.755046
SHEN	2001	B1	-0.00333	0.000431	505	-7.72972	5.87E-14
SHEN	2001	B2	-0.12285	0.021335	505	-5.7579	1.48E-08
SHEN	2001	B3	-0.00202	0.00425	505	-0.47464	0.63525
SHEN	2001	B4	0.991987	0.120031	505	8.264387	1.25E-15
SHEN	2001	B5	-0.00883	0.00159	505	-5.55461	4.51E-08
SHEN	2001	alpha	8.47104	5.843757	505	1.449588	0.147794

STRI	2002	B0	0.089995	0.454937	216	0.197818	0.843373
STRI	2002	B1	-0.00294	0.00055	216	-5.34448	2.3E-07
STRI	2002	B2	-0.00055	0.044862	216	-0.01226	0.990226
STRI	2002	B3	-0.00181	0.00615	216	-0.29397	0.769064
STRI	2002	B4	1.407939	0.177847	216	7.916566	1.27E-13
STRI	2002	B5	-0.00526	0.001935	216	-2.71941	0.007072
STRI	2002	alpha	2.115455	0.854225	216	2.476462	0.014037

APPENDIX D: VSP SURVEYS REVIEWED FOR THIS ANALYSIS

SURVEY	YEAR
Little River Canyon National Preserve	Summer 2010
Ninety Six National Historic Site	Spring-Summer 2010
San Juan National Historic Site	Winter 2010
Death Valley National Park	Spring 2010
Death Valley National Park	Fall 2009
Martin Van Buren National Historic Site	Summer 2009
Grand Teton National Park-LSR Preserve	Summer 2009
Acadia National Park	Summer 2009
Indiana Dunes National Lakeshore	Summer 2009
Bryce Canyon National Park	Summer 2009
Boston National Historical Park	Summer 2009
James A. Garfield National Historic Site	Summer 2009
Sleeping Bear Dunes National Lakeshore	Summer 2009
Yosemite National Park	Summer 2009
Klondike Gold Rush National Historical Park--Seattle	Summer 2009
Women's Rights National Historical Park	Summer 2009
Perry's Victory & International Peace Memorial	Summer 2009
Minuteman Missile National Historic Site	Summer 2009
Homestead National Monument of America	Summer 2009
Fort Larned National Historic Site	Summer 2009
City of Rocks National Reserve	Fall 2008
Herbert Hoover National Historic Site	Summer 2008
Grand Teton National Park	Summer 2008
Great Smoky Mountains National Park	Fall 2008
Great Smoky Mountains National Park	Summer 2008
Capitol Reef National Park	Spring 2008
Fire Island National Seashore Visitor	Summer 2008
Fire Island National Seashore Resident	Spring 2008
Carl Sandburg Home National Historic Site	Spring 2008
Horseshoe Bend National Military Park	Spring 2008
Everglades National Park	Winter & Spring 2008
Yosemite National Park	Winter 2008
Blue Ridge Parkway	Fall 2007 & Summer 2008
Minute Man National Historical Park	Summer 2007
Independence National Historical Park	Summer 2007
Rainbow Bridge National Monument	Summer 2007
Ebey's Landing National Historical Reserve	Summer 2007
Mount Rushmore National Memorial	Summer 2007
Agate Fossil Beds National Monument	Summer 2007
Fort Donelson National Battlefield	Summer 2007
Fort Union Trading Post National Historic Site	Summer 2007
John Muir National Historic Site	Summer 2007
Lava Beds National Monument	Summer 2007
Glen Canyon National Recreation Area	Spring & Summer 2007
Hawaii Volcanoes National Park	Spring 2007
Big Cypress National Preserve ORV Permit Holder/Camp Owner (mail only)	Spring 2007

SURVEY	YEAR
Big Cypress National Preserve	Spring 2007
Zion National Park	Summer & Fall 2006
Katmai National Park & Preserve	Summer 2006
Golden Spike National Historic Site	Summer 2006
Denali National Park & Preserve	Summer 2006
Monocacy National Battlefield	Summer 2006
Yellowstone National Park	Summer 2006
Mammoth Cave National Park	Summer 2006
Devils Postpile National Monument	Summer 2006
John Fitzgerald Kennedy National Historic Site	Summer 2006
Kings Mountain National Military Park	Spring 2006
Nicodemus National Historic Site	Summer 2005
Johnstown Flood National Memorial	Summer 2005
Cuyahoga Valley National Park	Summer 2005
Harpers Ferry National Historical Park	Summer 2005
Fort Sumter National Monument	Summer 2005
Yosemite National Park	Summer 2005
Timpanogos Cave National Monument	Summer 2005
Chickasaw National Recreation Area	Summer 2005
Lincoln Home National Historic Site	Spring 2005
San Francisco Maritime National Historical Park	Spring 2005
Congaree National Park	Spring 2005
John Day Fossil Beds National Monument	Summer 2004
Manzanar National Historic Site	Summer 2004
Saint-Gaudens National Historic Site	Summer 2004
Effigy Mounds National Monument	Summer 2004
Keweenaw National Historical Park	Summer 2004
Apostle Islands National Lakeshore	summer 2004
Dayton Aviation Heritage National Historical Park	Summer 2004
Craters of the Moon National Monument & Preserve	Summer 2004
George Washington Birthplace National Monument	Summer 2004
New River Gorge National River	Summer 2004
Joshua Tree National Park	Spring 2004
Mojave National Preserve	Fall 2003
Arches National Park	Summer 2003
Fort Stanwix National Monument	Summer 2003
Knife River Indian Villages National Historic Site	Summer 2003
Oregon Caves National Monument	Summer 2003
Capulin Volcano National Monument	Summer 2003
C&O Canal National Historical Park	Summer 2003
Grand Canyon National Park-South Rim	Summer 2003
Grand Canyon National Park-North Rim	Summer 2003
Cowpens National Battlefield	Spring 2003
Gateway National Recreation Area: Floyd Bennett Field	Spring 2003
Stones River National Battlefield	Fall 2002
Hopewell Furnace National Historic Site	Summer 2002
Catoclin Mountain Park	Summer 2002

SURVEY	YEAR
Sequoia & Kings Canyon National Parks and Sequoia National Forest	Summer 2002
Wright Brothers National Memorial	Summer 2002
Fort Raleigh National Historic Site	Summer 2002
Cape Hatteras National Seashore	Summer 2002
Outer Banks Group (Cape Hatteras NS, Ft. Raleigh NHS, and Wright Brothers NMem)	Summer 2002
Pipestone National Monument	Summer 2002
Great Sand Dunes National Monument & Preserve	Summer 2002
Pinnacles National Park	Spring 2002
Dry Tortugas National Park	Spring 2002
Everglades National Park	Spring 2002
Valley Forge National Historical Park	Summer 2001
Crater Lake National Park	Summer 2001
Pictured Rocks National Lakeshore	Summer 2001
Shenandoah National Park	Summer 2001
Colonial National Historical Park (Jamestown)	Summer 2001
Biscayne National Park	Spring 2001
Mount Rainier National Park	Summer 2000
Badlands National Park	Summer 2000
Eisenhower National Historic Site	Summer 2000
Olympic National Park	Summer 2000
USS Arizona Memorial	Summer 2000
The White House Tour and White House Visitor Center	Spring 2000
Haleakala National Park	Spring 2000
Cumberland Gap National Historical Park	Fall 1999
Lassen Volcanic National Park	Summer 1999
Kenai Fjords National Park	Summer 1999
Glacier Bay National Park & Preserve	Summer 1999
New Bedford Whaling National Historical Park	Summer 1999
Rock Creek Park	Summer 1999
St. Croix National Scenic Riverway	Summer 1999
San Juan National Historic Site, Puerto Rico	Winter 1999
Big Cypress National Preserve	Winter 1999
Acadia National Park	Summer 1998
Whiskeytown National Recreation Area	Summer 1998
Klondike Gold Rush National Historical Park, AK	Summer 1998
National Monuments & Memorials, Washington, D.C.	Summer 1998
Iwo Jima/Netherlands Carillon Memorials	Summer 1998
Cumberland Island National Seashore	Spring 1998
Chattahoochee River National Recreation Area	Spring 1998
Jean Lafitte National Historical Park & Preserve	Spring 1998
Lowell National Historical Park	Summer 1997
Voyageurs National Park	Summer 1997
Bryce Canyon National Park	Summer 1997
Grand Teton National Park	Summer 1997
Lincoln Boyhood Home National Memorial	Summer 1997
Martin Luther King, Jr., National Historic Site	Spring 1997

SURVEY	YEAR
Mojave National Preserve	Spring 1997
Virgin Islands National Park	Spring 1997
Great Smoky Mountains National Park	Summer & Fall 1996
Prince William Forest Park	Fall 1996
Death Valley National Park	Fall 1996
Chamizal National Memorial	Summer 1996
Great Smoky Mountains National Park	Summer 1996
Great Falls Park, Virginia	Spring 1996
Fort Bowie National Historic Site	Spring 1996
Chiricahua National Monument	Spring 1996
Everglades National Park	Spring 1996
Dry Tortugas National Park	Summer 1995
San Francisco Maritime National Historical Park	Summer 1995
Booker T. Washington National Monument	Summer 1995
Manassas National Battlefield Park	Summer 1995
Devils Tower National Monument	Summer 1995
Adams National Historic Site	Summer 1995
Wrangell-St. Elias National Park & Preserve	Summer 1995
Bandelier National Monument	Summer 1995
Yellowstone National Park	Winter 1995
Grand Teton National Park	Winter 1995
Gettysburg National Military Park	Fall 1994
Indiana Dunes National Lakeshore	Fall 1994
Canaveral National Seashore	Summer 1994
San Juan Island National Historical Park	Summer 1994
Edison National Historic Site	Summer 1994
Nez Perce National Historical Park	Summer 1994
Wolf Trap Farm Park for the Performing Arts	Summer 1994
Anchorage Alaska Public Lands Information Center	Summer 1994
San Antonio Missions National Historical Park	Spring 1994
Death Valley National Monument Backcountry	Spring 1994
Bryce Canyon National Park	Fall 1993
Canyon de Chelly National Monument	Summer 1993
Pecos National Historical Park	Summer 1993
Channel Islands National Park	Summer 1993
Redwood National Park	Summer 1993
Indiana Dunes National Lakeshore	Summer 1993
Sitka National Historical Park	Summer 1993
Whitman Mission National Historic Site	Summer 1993
Santa Monica Mountains National Recreation Area	Spring 1993
Belle Haven Park/Dyke Marsh Wildlife Preserve	Spring 1993
Arlington House-The Robert E. Lee Memorial	Summer 1992
Klondike Gold Rush National Historical Park, AK	Summer 1992
New River Gorge National River	Summer 1992
Zion National Park	Summer 1992
Jefferson National Expansion Memorial	Summer 1992
Bent's Old Fort National Historic Site	Summer 1992

SURVEY	YEAR
Glen Echo Park	Spring 1992
Frederick Douglass National Historic Site	Spring 1992
Big Bend National Park	Spring 1992
The White House Tours, President's Park	Fall 1991
City of Rocks National Reserve	Summer-Fall 1991
Stehekin-North Cascades NP/ Lake Chelan NRA	Summer 1991
Natchez Trace Parkway	Spring 1991
The White House Tours, President's Park	Spring 1991
Joshua Tree National Monument	Spring 1991
Jean Lafitte National Historical Park	Spring 1991
John Day Fossil Beds National Monument	Summer 1990
Scott's Bluff National Monument	Summer 1990
Glacier National Park	Summer 1990
Death Valley National Monument	Summer 1990
Petersburg National Battlefield	Summer 1990
Gateway National Recreation Area	Summer 1990
Kenai Fjords National Park	Summer 1990
National Monuments & Memorials, Washington, D.C.	Summer 1990
White Sands National Monument	Spring-Summer 1990
Canyonlands National Park	Spring 1990
Muir Woods National Monument	Summer 1989
Delaware Water Gap National Recreation Area	Summer 1989
Yellowstone National Park	Summer 1989
Lincoln Home National Historical Site	Summer 1989
The White House Tours, President's Park	Summer 1989
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Statue of Liberty National Monument	Summer 1989
Everglades National Park	Winter 1989
Craters of the Moon National Monument	Summer 1988
Bryce Canyon National Park	Summer 1988
Denali National Park and Preserve	Summer 1988
Glen Canyon National Recreational Area	Summer 1988
Independence National Historical Park	4 seasons 1987
Yellowstone National Park	Summer 1987
Shenandoah National Park	Summer & Fall 1987
Mesa Verde National Park	Summer 1987
Harpers Ferry National Historical Park	Summer 1987
Grand Teton National Park	Summer 1987
Colonial National Historical Park	Summer & Fall 1987
Valley Forge National Historical Park	Summer 1986
Independence National Historical Park	Summer 1986
Gettysburg National Military Park	Summer 1986
Crater Lake National Park	Summer 1985
North Cascades National Park Service Complex	Summer 1985
Mapping visitor populations: A pilot study at Yellowstone National Park	Summer 1983
Mapping interpretive services: A follow-up study at Yellowstone NP and Mt Rushmore NMem	Summer 1983

SURVEY	YEAR
Mapping interpretive services: Identifying barriers to adoption and diffusion of the method	Summer 1983
Mapping interpretive services: A pilot study at Grand Teton National Park.	Summer 1982

APPENDIX E: MASTER CATALOGUE OF VSP SURVEY QUESTIONS

The master catalogue of VSP survey questions can be accessed through the main University of Idaho VSP website.

<https://vsp.uidaho.edu/>