Linking the Economy and Environment of Florida Keys/Florida Bay

IMPORTANCE AND SATISFACTION RATINGS BY RECREATING VISITORS TO THE FLORIDA KEYS / KEY WEST

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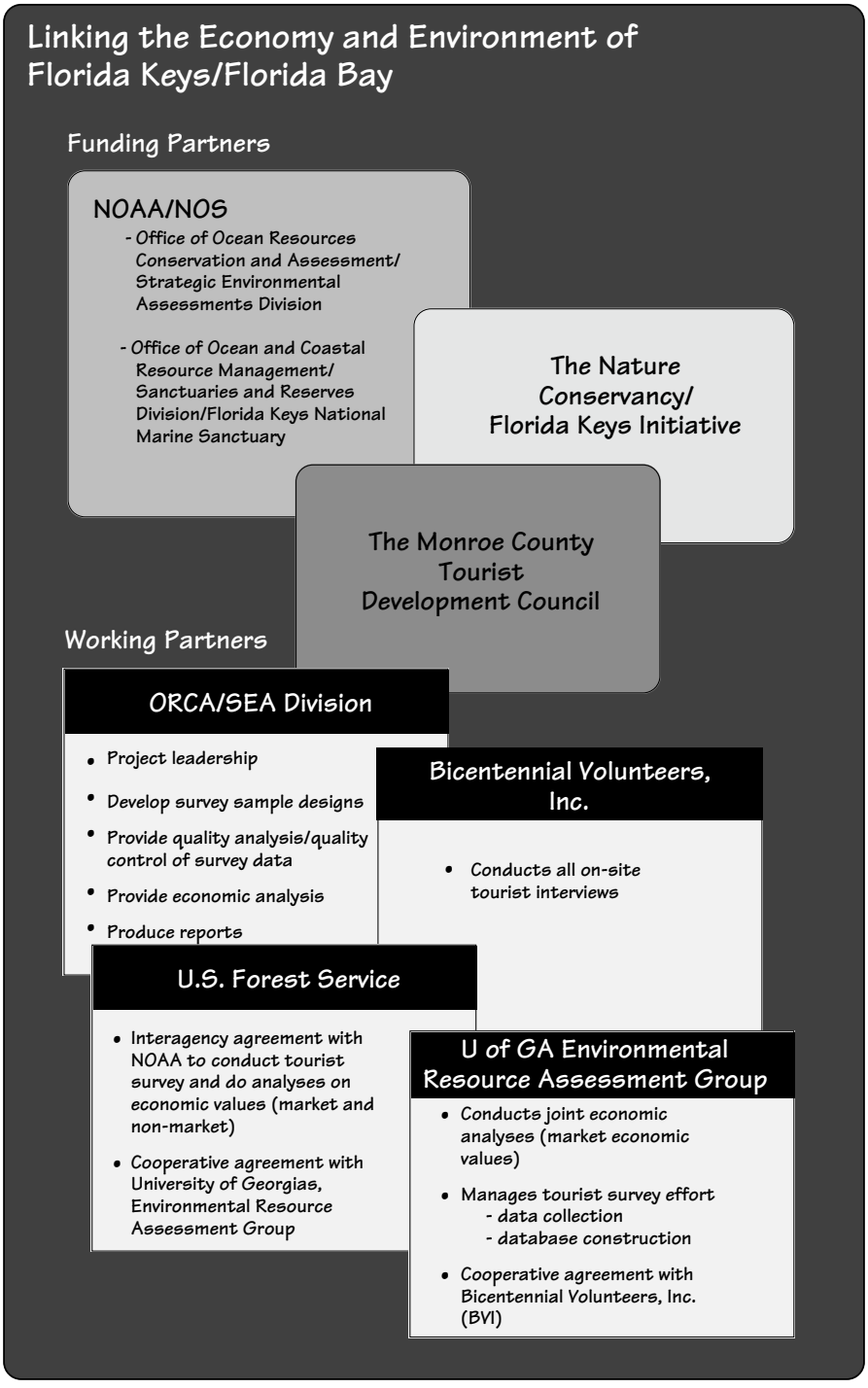


Table of Contents

List of Tables

List of Figures

List of Appendix Tables

Introduction

This is the third report in a series on visitors to the Florida Keys/Key West as part of the project entitled "Linking the Economy and Environment of the Florida Keys/Florida Bay." The first report, "Visitor Profiles: Florida Keys/Key West," provides detailed profiles of visitors in terms of the number of visitors by mode of access (auto, air and cruise ship), activity participation by region (Upper Keys, Middle Keys, Lower Keys and Key West), intensity of activity (days and hours), demographic profiles (age, race/ethnicity, sex, household income, household type, party size, party type, education, employment status, and disabilities), and spending patterns (per person per day and per person per trip). This report is referenced under Leeworthy and Wiley (1996).

The second report in the series, "Economic Contribution of Recreating Visitors to the Florida Keys/Key West," provides estimates of the market economic impacts of visitors on both the Monroe County and South Florida economies in terms of sales, output, income and employment. This report is referenced under English et al. (1996).

This report includes ratings given by visitors on the importance of, and satisfaction derived from 25 natural resource attributes, facilities and services. For presentation, a technique called "importance-performance" or "importance-satisfaction" is used. This technique is a simple but useful way in which to summarize and provide an interpretation of visitor ratings. We hope that businesses will find the information useful in marketing applications and in improving the delivery of services and facilities to visitors. Similarly, we believe that government agencies responsible for managing natural resources or providing facilities and services will find the information useful when taking the customer-satisfaction approach in their endeavors.

Mailback Survey. The information reported here was obtained from the mailback portion of the Auto, Air and Cruise Ship Surveys conducted during July-August 1995 and during January-April 1996. Over 3,500 on-site interviews were conducted during this five-month sampling period on the highway (U.S. 1), at the two commercial airports (Key West and Marathon), and at the cruise ship docks in Key West. There were 1,812 respondents to the mailback portion of the survey out of 3,584 total on-site interviews, for a response rate of 50.56 percent (47 percent during the summer and 52.6 percent during the winter). Response rates varied by mode of access (auto, air and cruise ship), age, household income, race/ethnicity, and whether the visitor was foreign or domestic. Generally, response rates were higher for older visitors, for visitors with higher household incomes, visitors that were White Not Hispanic, and for domestic visitors. An analysis on possible non-response bias was conducted and it was found that although there were significant differences in response rates by the socioeconomic factors cited above, these factors were not generally significant or had high explanatory power for most responses. It was concluded that there was the possibility of some non-response bias, but that sample weighting might adjust for the problem, making it insignificant. For details on the sampling methods, methods of estimating, and sample weighting, see Leeworthy (1996).

Importance-Satisfaction Analysis. For many years, the U.S. Forest Service and many other federal, state, and local agencies that manage parks and/or other natural resources have used the National Satisfaction Index (NSI) for measuring visitor satisfaction. Satisfaction is a complex feature of the recreation/tourist experience and it is now agreed upon by most researchers that "Importance-Performance" or "Importance-Satisfaction" is a much more complete measure and provides a much simpler interpretation than the NSI. First described in the marketing literature by Martilla and James (1977), it has been described and/or used in such studies as Guadgnolo (1985), Richardson (1987), Hollenhorst, Olson, and Fortney (1992), Leeworthy and Wiley (1994) and Leeworthy and Wiley (1995).

The satisfaction mailback questionnaire was divided into two sections to obtain the necessary information for the importance-satisfaction analysis. The first section asks the respondent to read each statement and rate the **importance** of each of the 25 items *as it contributes to an ideal recreation/tourist setting for the activities they did in the Florida Keys/Florida Bay area.* Each item is rated or scored on a one to five scale (1-5) with one (1) meaning "Not Important" and five (5) meaning "Extremely Important." The respondent was also given the choices of answering "Not Applicable" or "Don't Know." The second section asks the respondent to consider the same list of items they just rated for importance and to rate them for how **satisfied** they were with each item *at the places they did their activities in the Florida Keys/Florida Bay area.* Again, a five

point scale was used with one (1) meaning “Terrible” and a score of five (5) meaning “Delighted.” Respondents were also given the choices of answering either “Not Applicable” or “Don’t Know.”

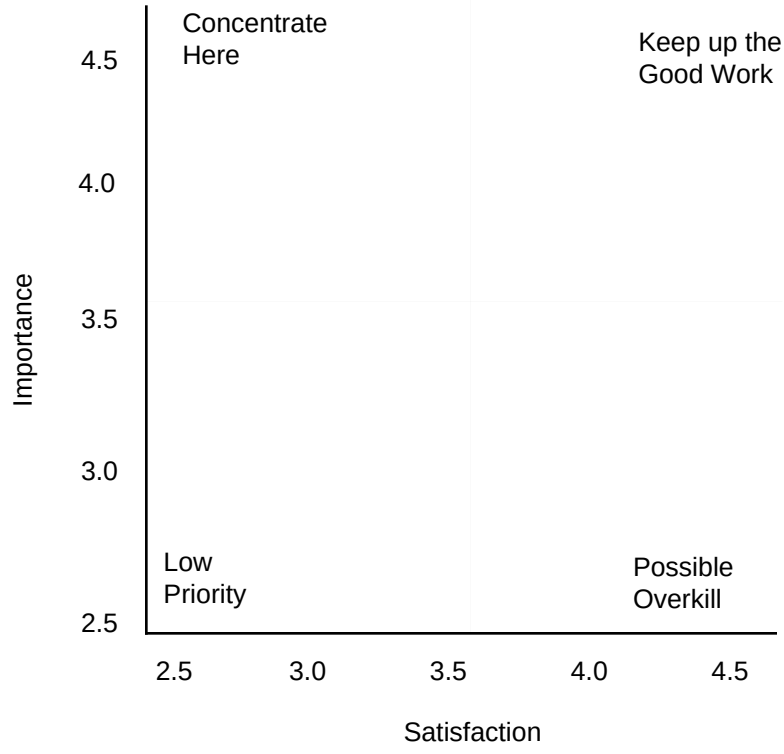
In this report, the collected data is presented in several ways. First, the means or average scores are reported along with the estimated standard errors of the mean, the sample sizes (number of responses), and the percent of respondents that gave a rating. This latter measure is important because many respondents provide importance ratings for selected items but may not have had a chance to use a resource, facility, or service and therefore do not provide a satisfaction rating. This might lead to biases in comparing importance and satisfaction. However, in recent applications, we have found that the analysis is robust with respect to this problem, i.e., it has no significant impact on the conclusions (see Leeworthy and Wiley 1994 and 1995).

The second method of presentation is the bar charts showing the mean scores for each item for importance and satisfaction. It is important to note that while both importance and satisfaction are measured on a one to five scale, the scales have different meanings are not really directly comparable. They do, however, communicate relative importance/satisfaction relationships across the different items. But some find this harder to work with than the simpler analytical framework provided next.

The most useful analytical framework provided in importance-satisfaction analysis is the four-quadrant presentation. The four quadrants are formed by first placing the importance measurement on the vertical axis and the satisfaction measurement on the horizontal axis (see Figure 1). An additional vertical line is placed at the mean score for all 25 items on the satisfaction scale and an additional horizontal line is placed at the mean score for all 25 items on the importance scale. These two lines form a cross hair. The cross hair then separates the importance-satisfaction measurement area into four separate areas or quadrants. This allows for interpretation as to the “***relative importance***” and “***relative satisfaction***” of each item. That is, if everyone gave high scores to all items in the Florida Keys/Florida Bay area, we would still be able to judge the relative importance and satisfaction and establish priorities.

The use of the four quadrants provides a simple but easy-to-interpret summary of results. Scores falling in the upper left quadrant are relatively high on the importance scale and relatively low on the satisfaction scale. This quadrant is labelled “**Concentrate Here**.” Scores falling in the upper right quadrant are relatively high on the importance scale and also relatively high on the satisfaction scale and are labelled “**Keep up the Good Work**.” Scores falling in the lower left quadrant are relatively low on both the importance and satisfaction scale and are labelled “**Low Priority**.” And, finally, scores in the lower right quadrant are relatively low on the importance scale but relatively high on the satisfaction scale and are labelled “**Possible Overkill**.”

Figure 1. Importance/Satisfaction Matrix



This report is divided into three sections. In section one, the importance-satisfaction analysis is presented for 25 items by season (e.g., June - November 1995, December 1995 - May 1996, and a weighted annual average for June 1995 - May 1996). In section two, information is presented on 11 of the 25 items for which visitors who had visited the Florida Keys at least five years ago were asked to give retrospective satisfaction ratings.

That is, these visitors were asked to rate how satisfied they were with these 11 items five years ago. We then test for whether there has been a statistically significant increase or decline in the satisfaction with these items. In section three, we return to the importance-satisfaction analysis and apply it to visitors classified into four groups according to their participation in either natural resource-based activities or non-natural resource-based activities. Ten (10) of the items are selected and statistical tests are conducted for differences between groups of visitors classified in this fashion.

Importance-Satisfaction Analysis: All Visitors by Season

For presentation purposes, the 25 items that visitors were asked to rate are organized into four categories. In the survey, the order of the items was mixed. Each of the items is given a letter rather than a number and so are labelled A through Y. Items A through G are labelled "**Natural Resources."** These seven (7) items are either natural resources or attributes of natural resources such as clear water. Items H through M are labelled "**Natural Resource Facilities**." These six (6) items are either facilities that provide access to natural resources or areas or features that provide public access to natural resources. Items N through V are labelled "**Other Facilities**." These nine (9) items are either facilities or features of facilities that are not directly related to natural resources but are indirectly related since they represent items associated with the general infrastructure of the area. Items W through Y are labelled "**Services**." These three (3) items are either services or features of a service provided to visitors. We considered separate analyses for each group but rejected this approach in favor of establishing the relative importance of each item with respect to all items. The organization into four categories was done simply as an aid to those users that have responsibilities in separate areas.

June-November 1995. There were 628 respondents in total to the summer season survey. In none of the cases did 100 percent of all respondents give ratings for any one item. Figure 2 summarizes the importance-satisfaction results for the summer season; the last column reports the percent of respondents that provided a rating on the item. Generally, as was discussed earlier, a lower percent of respondents provide satisfaction ratings for a given item than provide importance ratings. The four-quadrant analysis places six items in the "**Concentrate Here**" quadrant. They are E. Opportunity to view large wildlife, F. Large numbers of fish, G. Quality of beaches, I. Shoreline access, T. Availability of public restrooms, and Y. Value for the price.

December '95 - May '96. There were 1,184 respondents in total to the winter season survey. As in the summer survey, in no cases did 100 percent of visitors rate any particular item for importance or satisfaction. Figure 3 summarizes the importance-satisfaction results for the winter season. The four-quadrant analysis places five items in the "**Concentrate Here**" quadrant. They are E. Opportunity to view large wildlife, G. Quality of beaches, I. Shoreline access, J. Designated swimming/beach areas, T. Availability of public restrooms, and Y. Value for the price.

June '95 - May '96. For the entire year, there were 1,812 respondents. The results presented in Figure 4 are weighted annual averages. The four-quadrant analysis places six items in the "**Concentrate Here**" quadrant. They are E. Opportunity to view large wildlife, G. Quality of beaches, I. Shoreline access, J. Designated swimming/beach areas, T. Availability of public restrooms, and Y. Value for the price.

Cautionary Note. The results presented here are not intended as any policy statement about what either business or governments should or should not be doing. The interpretive framework for the importance-satisfaction is simply intended as a helpful guide in organizing the ratings given by visitors.

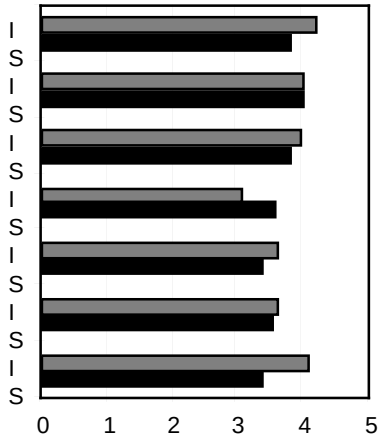
Satisfaction with Selected Items: Current Ratings versus Ratings Five Years Ago

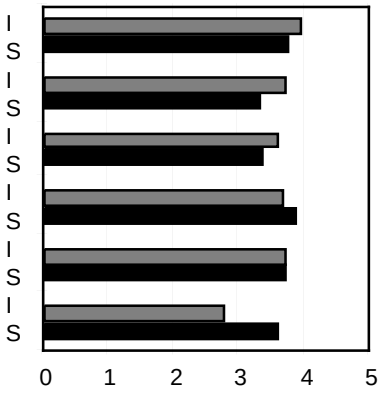
As discussed in the Introduction, a subsample of visitors were asked to provide a retrospective rating for 11 of the 25 items presented in the importance-satisfaction analysis. The subsample of visitors was based on the answer to the following question: Had you visited the Florida Keys more than five years ago? Forty-two (42) percent answered YES to this question. This subsample was then asked to provide the retrospective rating for the 11 items. Table 1 presents the 11 items, summarizes the mean scores along with the estimated standard errors of the mean, and lists the sample size (or number of responses for each item). Also provided are the results of statistical tests for the difference in mean scores between the current rating and the rating

(text continued on page 11)

Figure 2. Importance/Satisfaction Matrix Code Descriptions, Graph of Means, and Descriptive Statistics: June - November 1995

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources					
A. Clear water (high visibility)		4.21	0.0378	555	88
		3.81	0.0393	522	83
B. Amount of living coral on reefs		3.96	0.0552	520	83
		3.75	0.0430	395	63
C. Many different kinds of fish and sea life to view		3.94	0.0484	546	87
		3.83	0.0407	440	70
D. Many different kinds of fish and sea life to catch		3.02	0.0715	501	80
		3.59	0.0514	296	47
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)		3.64	0.0507	551	88
		3.38	0.0504	405	64
F. Large numbers of fish		3.63	0.0572	537	86
		3.54	0.0442	387	62
G. Qualtiy of beaches		4.13	0.0453	557	89
		3.38	0.0498	435	69
Natural Resource Facilities					
H. Parks and specially protected areas		3.92	0.0439	559	89
		3.75	0.0367	404	64
I. Shoreline access		3.73	0.0488	536	85
		3.33	0.0445	427	68
J. Designated swimming/beach areas		3.62	0.0536	547	87
		3.34	0.0506	407	65
K. Mooring buoys near coral reefs		3.63	0.0640	461	73
		3.88	0.0487	274	44
L. Marina facilities		2.78	0.0602	476	76
		3.71	0.0435	291	46
M. Boat ramps/launching facilities		2.76	0.0641	457	73
		3.59	0.0578	221	35
Other Facilities					
N. Historic preservation (historic landmarks, houses, etc.)		3.65	0.0465	570	91
		3.84	0.0361	429	68
O. Parking		3.20	0.0512	520	83
		3.39	0.0458	411	65
P. Public Transportation		2.07	0.0552	473	75
		3.32	0.0587	193	31
Q. Directional Signs, street signs, mile markers		3.65	0.0457	582	93
		3.72	0.0407	552	88
R. Condition of bike paths and sidewalks/ walking paths		3.37	0.0528	537	86
		3.61	0.0373	398	63
S. Condition of roads and streets		3.61	0.0425	576	92
		3.60	0.0320	556	89
T. Availability of public restrooms		3.72	0.0454	571	91
		3.26	0.0425	458	73
U. Cleanliness of streets and sidewalks		3.72	0.0413	577	92
		3.66	0.0328	523	83
V. Uncrowded conditions		3.56	0.0441	566	90
		3.51	0.0343	542	86

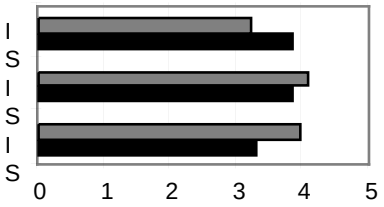




I - Importance, S - Satisfaction

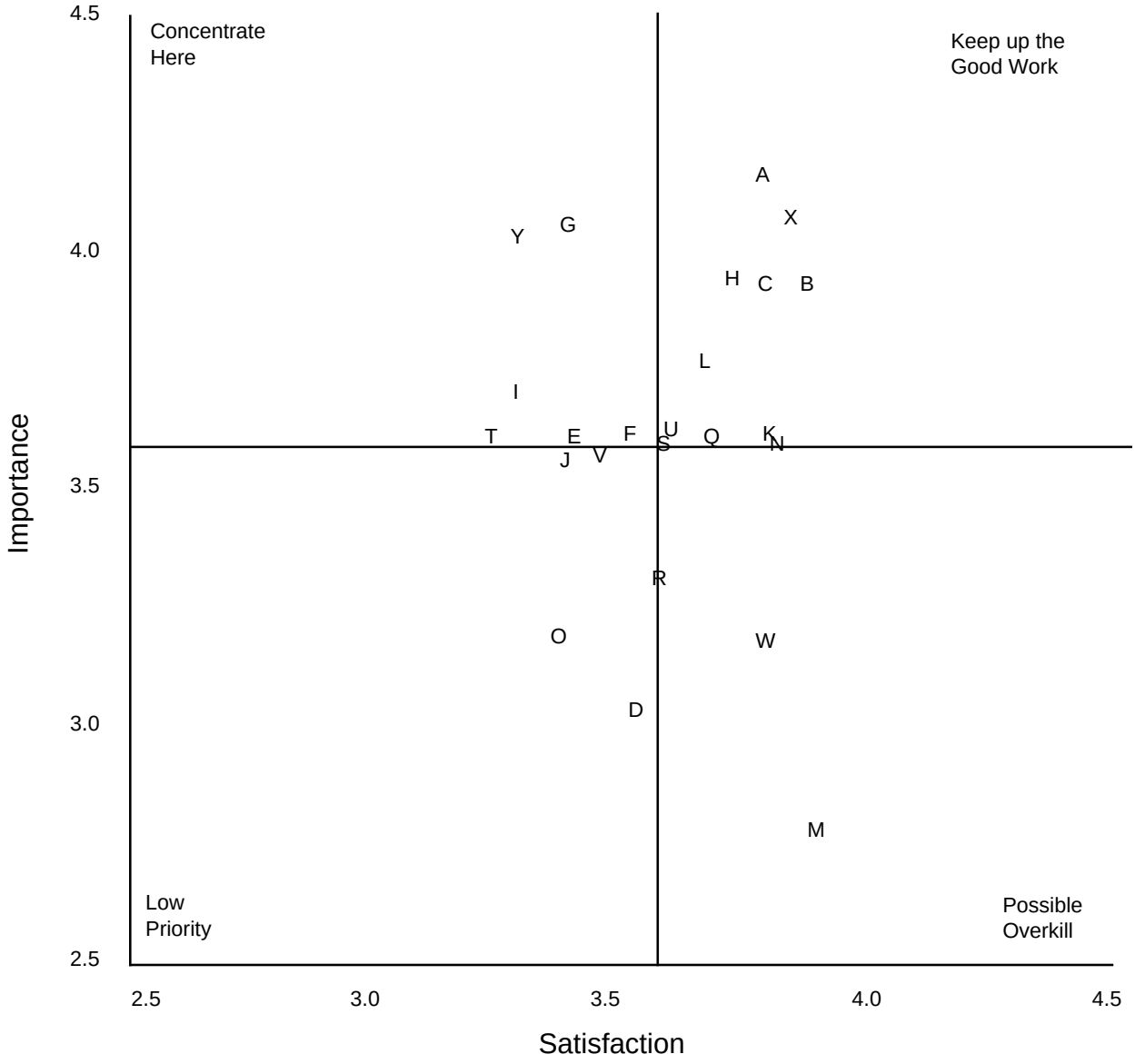
Figure 2. Importance/Satisfaction Matrix Code Descriptions, Graph of Means, and Descriptive Statistics: June - November 1995 (Continued)

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information		3.25	0.0497	559	89
X. Service and friendliness of people		3.86	0.0382	434	69
Y. Value for the price		4.13	0.0373	580	92
		3.87	0.0336	544	87
		4.17	0.0376	573	91
		3.31	0.0364	536	85



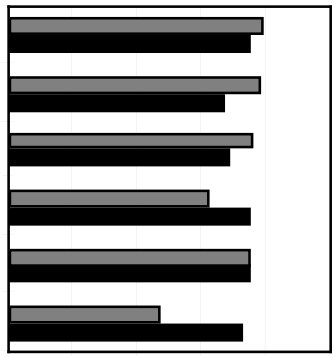
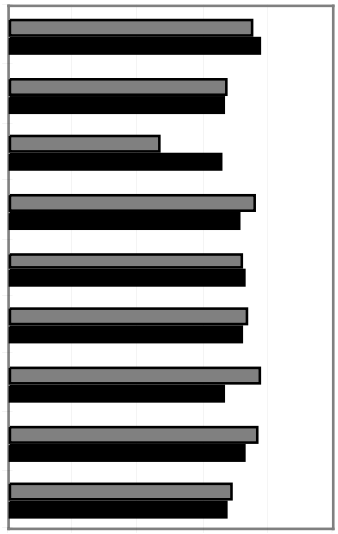
I - Importance, S - Satisfaction

Importance/Satisfaction Matrix: June - November 1995[1]



1. Item P., Public Transportation does not appear because it's importance score is less than 2.5.

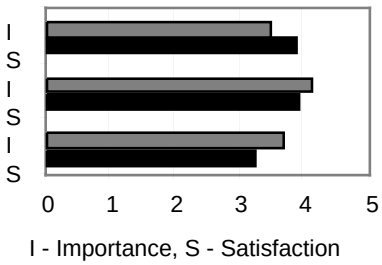
Figure 3. Importance/Satisfaction Matrix Code Descriptions, Graph of Means, and Descriptive Statistics: December 1995 - May 1996

Code from Matrix - Description		Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources						
A. Clear water (high visibility)	I		3.94	0.0308	1032	87
	S		3.83	0.0278	964	81
B. Amount of living coral on reefs	I		3.72	0.0394	928	78
	S		3.71	0.0319	581	49
C. Many different kinds of fish and sea life to view	I		3.62	0.0353	1028	87
	S		3.72	0.0280	739	62
D. Many different kinds of fish and sea life to catch	I		2.75	0.0481	913	77
	S		3.60	0.0422	432	36
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)	I		3.59	0.0358	1037	88
	S		3.29	0.0350	738	62
F. Large numbers of fish	I		3.38	0.0400	969	82
	S		3.50	0.0356	625	53
G. Qualtiy of beaches	I		4.21	0.0282	1064	90
	S		3.51	0.0292	883	75
Natural Resource Facilities		0 1 2 3 4 5				
H. Parks and specially protected areas	I		3.93	0.0300	1061	90
	S		3.74	0.0252	814	69
I. Shoreline access	I		3.90	0.0314	1049	89
	S		3.37	0.0297	867	73
J. Designated swimming/beach areas	I		3.91	0.0336	1046	88
	S		3.42	0.0302	820	69
K. Mooring buoys near coral reefs	I		3.07	0.0521	769	65
	S		3.75	0.0488	306	26
L. Marina facilities	I		2.55	0.0457	817	69
	S		3.72	0.0349	399	34
M. Boat ramps/launching facilities	I		2.36	0.0452	789	67
	S		3.62	0.0441	296	25
Other Facilities		0 1 2 3 4 5				
N. Historic preservation (historic landmarks, houses, etc.)	I		3.78	0.0312	1076	91
	S		3.91	0.0247	885	75
O. Parking	I		3.37	0.0346	1027	87
	S		3.30	0.0318	881	74
P. Public Transportation	I		2.45	0.0440	882	74
	S		3.37	0.0503	407	34
Q. Directional Signs, street signs, mile markers	I		3.78	0.0317	1091	92
	S		3.57	0.0261	1044	88
R. Condition of bike paths and sidewalks/ walking paths	I		3.62	0.0325	1023	86
	S		3.65	0.0279	786	66
S. Condition of roads and streets	I		3.66	0.0285	1099	93
	S		3.63	0.0214	1064	90
T. Availability of public restrooms	I		3.91	0.0293	1089	92
	S		3.33	0.0283	936	79
U. Cleanliness of streets and sidewalks	I		3.84	0.0267	1095	92
	S		3.65	0.0234	1041	88
V. Uncrowded conditions	I		3.48	0.0325	1074	91
	S		3.36	0.0265	1029	87
		0 1 2 3 4 5				

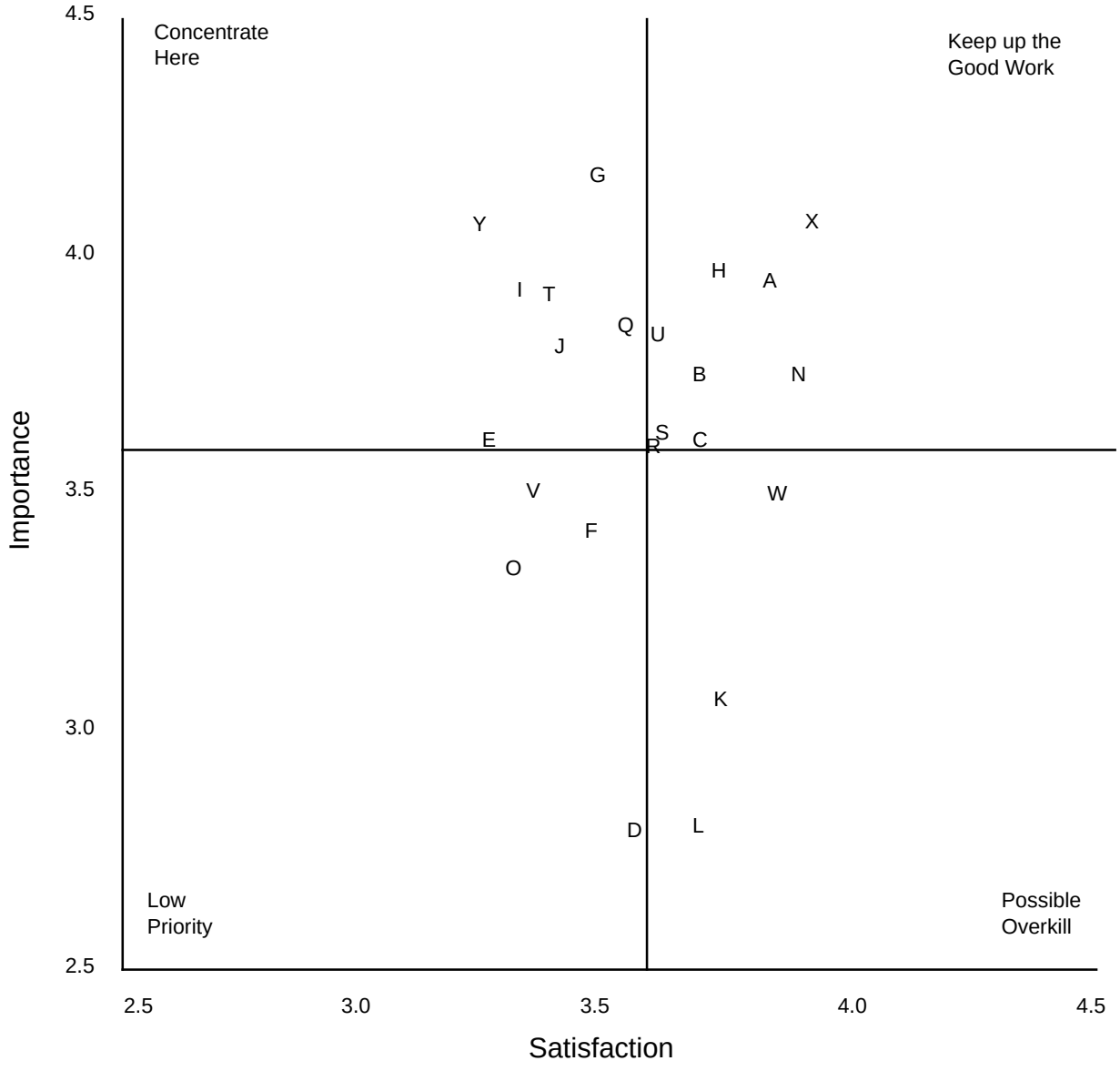
I - Importance, S - Satisfaction

Figure 3. Importance/Satisfaction Matrix Code Descriptions, Graph of Means, and Descriptive Statistics: December 1995 - May 1996 (Continued)

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information	I	3.51	0.0331	1058	89
	S	3.85	0.0241	915	77
X. Service and friendliness of people	I	4.14	0.0256	1106	93
	S	3.93	0.0232	1054	89
Y. Value for the price	I	4.08	0.0259	1090	92
	S	3.25	0.0262	1031	87



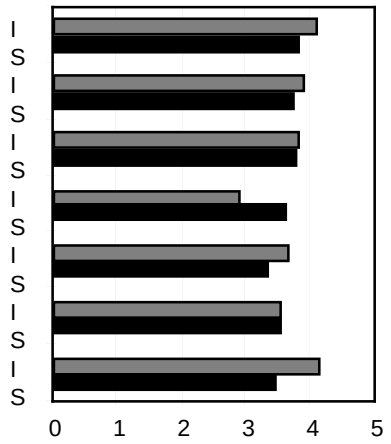
Importance/Satisfaction Matrix: December 1995 - May 1996[1]

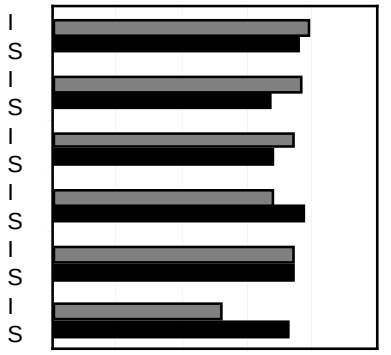


1. Items M. and P. do not appear because their importance score is less than 2.5.

Figure 4. Importance/Satisfaction Matrix Code Descriptions, Graph of Means, and Descriptive Statistics: June 1995 - May 1996

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources					
A. Clear water (high visibility)	I	4.07	0.0240	1587	88
	S	3.82	0.0228	1486	82
B. Amount of living coral on reefs	I	3.84	0.0326	1448	80
	S	3.73	0.0264	976	54
C. Many different kinds of fish and sea life to view	I	3.77	0.0288	1571	87
	S	3.77	0.0237	1179	65
D. Many different kinds of fish and sea life to catch	I	2.88	0.0407	1414	78
	S	3.59	0.0331	728	40
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)	I	3.62	0.0293	1588	88
	S	3.34	0.0291	1143	63
F. Large numbers of fish	I	3.50	0.0326	1506	83
	S	3.52	0.0289	1012	56
G. Qualtiy of beaches	I	4.17	0.0243	1621	89
	S	3.45	0.0261	1318	73
Natural Resource Facilities					
H. Parks and specially protected areas	I	3.93	0.0250	1620	89
	S	3.75	0.0207	1218	67
I. Shoreline access	I	3.82	0.0269	1585	87
	S	3.35	0.0248	1294	71
J. Designated swimming/beach areas	I	3.72	0.0293	1593	88
	S	3.38	0.0266	1227	68
K. Mooring buoys near coral reefs	I	3.35	0.0413	1230	68
	S	3.80	0.0354	580	32
L. Marina facilities	I	2.67	0.0368	1293	71
	S	3.71	0.0280	690	38
M. Boat ramps/launching facilities	I	2.56	0.0381	1246	69
	S	3.61	0.0365	517	29
Other Facilities					
N. Historic preservation (historic landmarks, houses, etc.)	I	3.72	0.0263	1646	91
	S	3.88	0.0203	1314	73
O. Parking	I	3.29	0.0289	1547	85
	S	3.34	0.0251	1292	71
P. Public Transportation	I	2.27	0.0346	1355	75
	S	3.35	0.0379	600	33
Q. Directional Signs, street signs, mile markers	I	3.72	0.0263	1673	92
	S	3.64	0.0225	1596	88
R. Condition of bike paths and sidewalks/ walking paths	I	3.51	0.0287	1560	86
	S	3.64	0.0221	1184	65
S. Condition of roads and streets	I	3.64	0.0239	1675	92
	S	3.62	0.0180	1620	89
T. Availability of public restrooms	I	3.82	0.0252	1660	92
	S	3.30	0.0236	1394	77
U. Cleanliness of streets and sidewalks	I	3.79	0.0229	1672	92
	S	3.66	0.0190	1564	86
V. Uncrowded conditions	I	3.52	0.0261	1640	91
	S	3.43	0.0210	1571	87

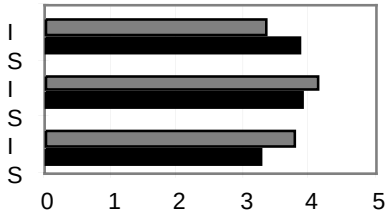




I - Importance, S - Satisfaction

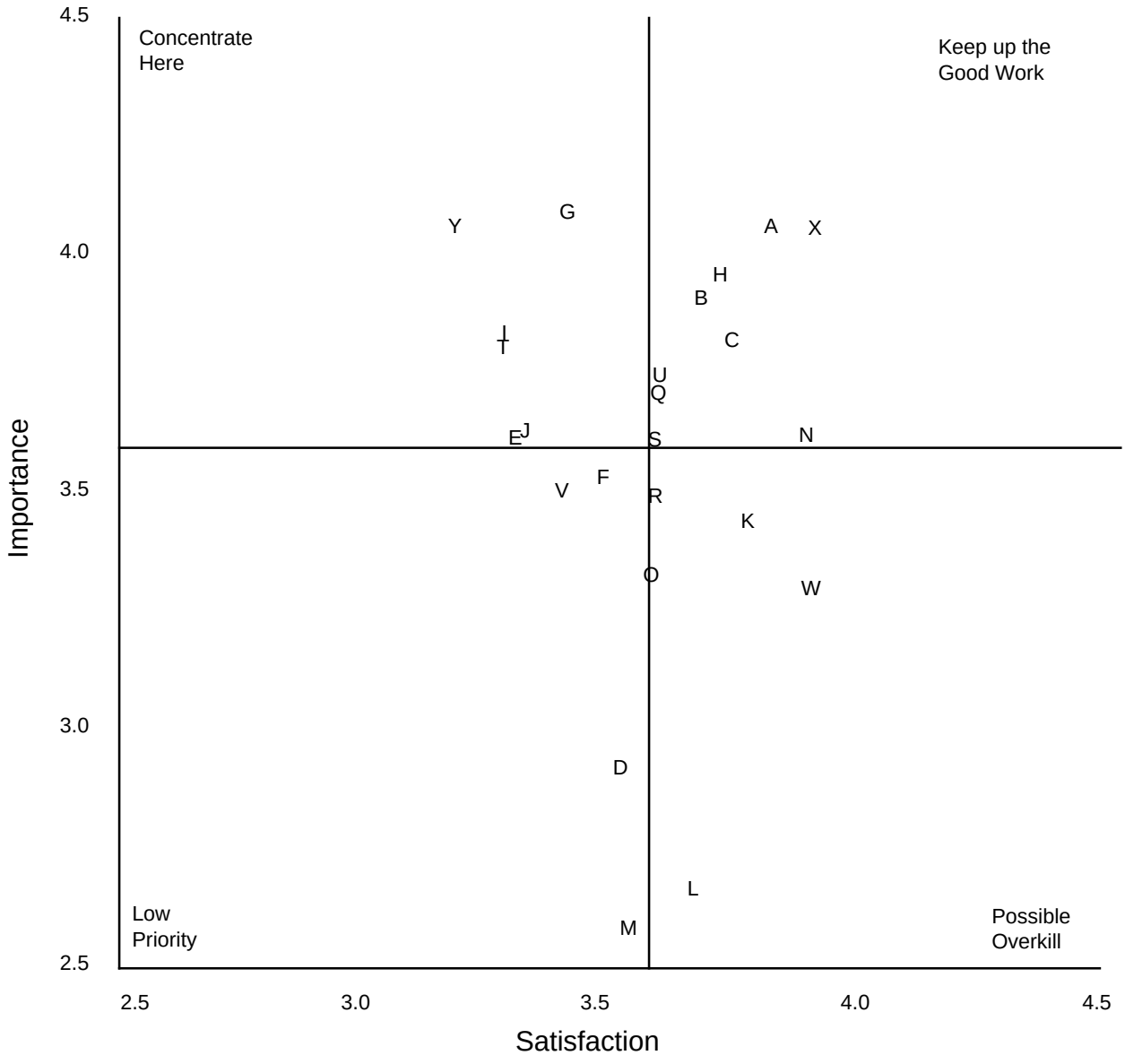
Figure 4. Importance/Satisfaction Matrix Code Descriptions, Graph of Means, and Descriptive Statistics: June 1995 - May 1996 (Continued)

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information	I	3.39	0.0281	1617	89
	S	3.85	0.0205	1349	74
X. Service and friendliness of people	I	4.14	0.0213	1686	93
	S	3.91	0.0191	1598	88
Y. Value for the price	I	4.12	0.0215	1663	92
	S	3.28	0.0213	1567	86



I - Importance, S - Satisfaction

Importance/Satisfaction Matrix: June 1995 - May 1996[1]



1. Item P., Public Transportation does not appear because it's importance score is less than 2.5.

Table 1. A Comparison of Satisfaction Ratings on 11 Selected Items: Current Ratings versus Five Years Ago

Item	Mean	Stderr	N	Significant Difference[1]
Clear Water (high visibility)				YES
Current rating	3.75	.035	627	
Five Years Ago	4.13	.032	600	
Amount of living coral on reefs				YES
Current rating	3.69	.040	442	
Five years ago	4.04	.040	437	
Opportunity to view large wildlife				YES
Current rating	3.35	.043	507	
Five years ago	3.72	.041	463	
Uncrowded conditions				YES
Current rating	3.39	.033	642	
Five years ago	3.74	.033	651	
Shoreline access				YES
Current rating	3.40	.037	543	
Five years ago	3.47	.038	574	
Quality of beaches				NO
Current rating	3.42	.039	563	
Five years ago	3.48	.039	594	
Service and friendliness of people				NO
Current rating	3.85	.029	661	
Five years ago	3.89	.027	666	
Historic preservation (historic landmarks, houses, etc)				NO
Current rating	3.88	.030	527	
Five years ago	3.93	.030	523	
Parks and specially protected areas				YES
Current rating	3.75	.033	536	
Five years ago	3.88	.032	541	
Value for the price				YES
Current rating	3.27	.034	655	
Five years ago	3.54	.034	649	
Conditions of roads and streets				YES
Current rating	3.61	.028	669	
Five years ago	3.53	.029	650	

1. YES means statistically significant difference with 95 percent confidence. Statistical test was a paired t-test for the differences in the means. Differences were normally distributed. Sample sizes for tests were based on those that gave ratings for current time period and for five years ago.

for each item five years ago. A YES in the last column of Table 1 indicates that there was a statistically significant difference in the two mean scores for an item. A paired t-test was done using PROC MEANS in SAS Version 6.11. Differences in the scores were first calculated and tests for normality were conducted. The differences were all normally distributed, making the paired t-test appropriate. The differences noted here were significant at least at the 95 percent confidence level. There were significant declines in satisfaction ratings for seven (7) of the 11 items and a significant increase in satisfaction for one (1) item. For three of the items, there was no significant difference.

Key Findings:

Satisfaction Ratings: Current versus Five Years Ago

- ***Clear water (high visibility).*** Significant decline.
- ***Amount of living coral on reefs.*** Significant decline.
- ***Opportunity to view large wildlife.*** Significant decline.
- ***Uncrowded conditions.*** Significant decline.
- ***Shoreline access.*** Significant decline.
- ***Quality of beaches.*** No difference.
- ***Service and friendliness of people.*** No difference.
- ***Historic preservation.*** No difference.
- ***Parks and specially protected areas.*** Significant decline.
- ***Value for the price.*** Significant decline.
- ***Conditions of roads and streets.*** Significant increase.

Comparative Importance of Selected Items: Participants in Natural Resource-based Activities versus Participants in Non-natural Resource-based Activities

In this section, visitors were classified into four groups. Two of the groups are not mutually exclusive, meaning that some of the same visitors are in both groups, and two groups are mutually exclusive, meaning that the same visitors are not in each group. Visitors were classified on the basis of their participation in **natural resource-based activities or non-natural resource-based activities**. Natural resource-based activities included diving, fishing, viewing wildlife/nature study, boating, or any beach activities. Non-natural resource-based activities included visiting museums and historic areas, sightseeing and attractions, attending cultural or special events, and swimming in outdoor pools. The four groups are presented in Table 2. Almost 72 percent "*did any natural resource-based activities,"* while almost 75 percent "*did any non-natural resource-based activities."* There is a large amount of cross-over between these two groups, so comparing satisfaction scores for these two groups would be considered a "weak" test for differences. Over 23 percent "*did only natural resource-based activities,"* while over 26 percent "*did only non-natural resource-based activities*." Since these latter two groups are mutually exclusive, comparisons of their satisfaction ratings are considered the "strong" test for differences. Appendix Tables A.1 through A.4 present the importance and satisfaction ratings for all 25 items for each group; only the annual weighted averages are presented. Here the findings are presented on statistical tests that were performed on 10 selected items with respect to importance ratings. Significant differences are based on analysis of variance tests on comparing mean importance scores for each item. A significant difference is defined as a difference at the 95 percent confidence level.

Table 2. Participation in Natural Resource-based versus Non-natural Resource-based Activities

Participation in Activities	Percent (YES)
Did Any Natural Resource-based Activities	71.8
Did Any Non-natural Resource-based Activities	74.7
Did Only Natural Resource-based Activities	23.6
Did Only Non-natural Resource-based Activities	26.5

Key Findings:

Importance Ratings: Participants that Did Only Natural Resource-based Activities versus Participants that Did Only Non-natural Resource-based Activities

- ***Clear water (high visibility).*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Amount of living coral on reefs.*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Many different kinds of fish and sealife to view.*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Many different kinds of fish and sealife to catch.*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Large numbers of fish.*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Opportunity to view large wildlife.*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Quality of beaches.*** No difference.
- ***Parks and specially protected areas.*** Significantly higher scores for those that participated in natural resource-based activities.
- ***Shoreline access.*** No difference.
- ***Historic preservation.*** Significantly higher scores for those that participated in non-natural resource-based activities.

Importance Ratings: Those that Did Any Natural Resource-based Activity versus Those that Did Any Non-natural Resource-based Activity

- ***Clear water (high visibility).*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Amount of living coral on reefs.*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Many different kinds of fish and sealife to view.*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Many different kinds of fish and sealife to catch.*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Large number of fish.*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Opportunity to view large wildlife.*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Quality of beaches.*** No difference.
- ***Parks and specially protected areas.*** Significantly higher scores for those that did any natural resource-based activities than for those that did any non-natural resource-based activities.
- ***Shoreline access.*** No difference.
- ***Historic preservation.*** Significantly higher scores for those that did any non-natural resource-based activities than for those that did any natural resource-based activities.

References

English, Donald B. K., Warren Kriesel, Vernon R. Leeworthy, and Peter C. Wiley, 1996 (draft). "Economic Contribution of Recreating Visitors to the Florida Keys/Key West." Athens, GA: USDA, Forest Service, Southern Forest Research Station; Athens, GA: The University of Georgia, Department of Agricultural and Applied Economics; and Silver Spring, MD: National Oceanic and Atmospheric Administration.

Guadagnolo, Frank. 1985. "The Importance-Performance Analysis: An Evaluation and Marketing Tool." Journal of Park and Recreation Administration 3 (2):13-22.

Hollenhorst, Steve, David Olson and Ronal Fortney. 1992. "Use of Importance-Performance Analysis to Evaluate State Park Cabins: The Case of the West Virginia Park System." Journal of Park and Recreation Administration 10 (1):1-11.

Leeworthy, Vernon R. 1996 (draft). "Technical Appendix: Sampling Methodologies and Estimation Methods Applied to the Florida Keys/Key West Visitor Surveys." Silver Spring, MD: National Oceanic and Atmospheric Administration.

Leeworthy, Vernon R. and Peter C. Wiley. 1996 (draft). "Visitor Profiles: Florida Keys/Key West." Silver Spring, MD: National Oceanic and Atmospheric Administration.

Leeworthy, Vernon R. and Peter C. Wiley. 1995. "A Socioeconomic Profile of Recreationists at Cumberland Island National Seashore." Silver Spring, MD: National Oceanic and Atmospheric Administration.

Leeworthy, Vernon R. and Peter C. Wiley. 1994. "A Socioeconomic Profile of Recreationists at Sonoma Coast State Beach." Silver Spring, MD: National Oceanic and Atmospheric Administration.

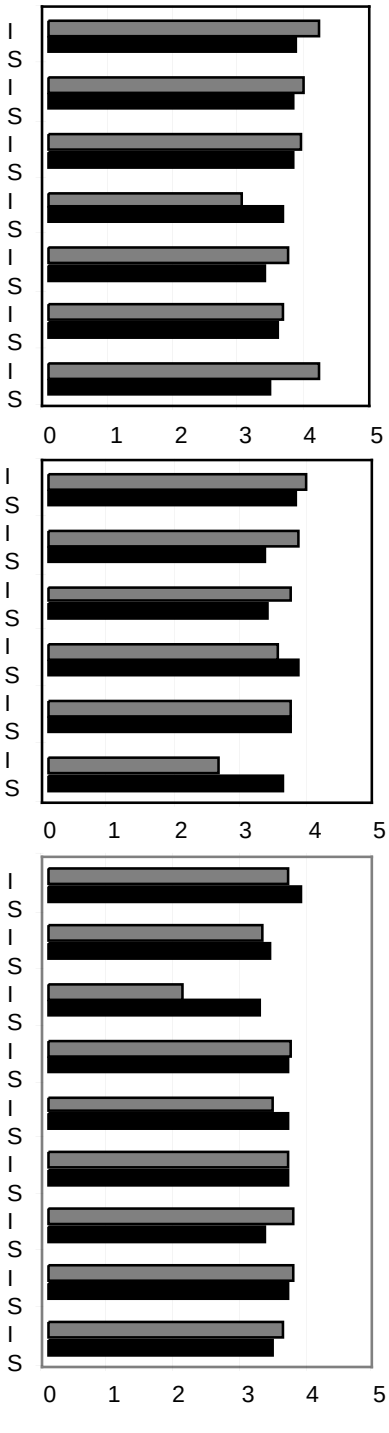
Martilla, John A. and John C. James. 1977. "Importance-Performance Analysis." Journal of Marketing 41 (1):77-79.

Richardson, Sarah L. 1987. "An Importance-Performance Approach to Evaluating Communication Effectiveness." Journal of Park and Recreation Administration 5 (4):71-83.

Appendix Tables

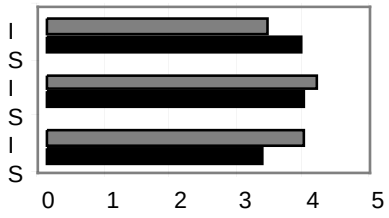
Table A.1 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Any Natural Resource-based Activities, June 1995 - May 1996

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources					
A. Clear water (high visibility)		4.14	0.0272	1175	85
		3.80	0.0267	1137	82
B. Amount of living coral on reefs		3.92	0.0368	1101	79
		3.73	0.0296	821	59
C. Many different kinds of fish and sea life to view		3.88	0.0330	1169	84
		3.78	0.2766	969	70
D. Many different kinds of fish and sea life to catch		2.97	0.0476	1074	78
		3.59	0.0360	628	45
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)		3.65	0.0345	1171	85
		3.33	0.0339	901	65
F. Large numbers of fish		3.60	0.0368	1136	82
		3.52	0.0320	861	62
G. Qualtiy of beaches		4.16	0.0290	1185	86
		3.43	0.0294	1019	74
Natural Resource Facilities					
H. Parks and specially protected areas		3.96	0.0292	1185	86
		3.78	0.0237	946	68
I. Shoreline access		3.83	0.0314	1165	84
		3.33	0.0286	1003	72
J. Designated swimming/beach areas		3.72	0.0347	1172	85
		3.36	0.0305	964	70
K. Mooring buoys near coral reefs		3.48	0.0467	940	68
		3.65	0.0381	506	37
L. Marina facilities		2.67	0.0428	969	70
		3.69	0.0307	560	40
M. Boat ramps/launching facilities		2.58	0.0443	941	68
		3.60	0.0403	424	31
Other Facilities					
N. Historic preservation (historic landmarks, houses, etc.)		3.66	0.0318	1177	85
		3.85	0.0236	925	67
O. Parking		3.26	0.0334	1150	83
		3.38	0.0287	1004	72
P. Public Transportation		2.10	0.0388	974	70
		3.22	0.0458	405	29
Q. Directional Signs, street signs, mile markers		3.71	0.0318	1209	87
		3.66	0.0265	1165	84
R. Condition of bike paths and sidewalks/ walking paths		3.44	0.0351	1124	81
		3.62	0.0260	871	63
S. Condition of roads and streets		3.63	0.0283	1208	87
		3.65	0.0205	1175	85
T. Availability of public restrooms		3.74	0.0303	1196	86
		3.30	0.0275	1021	74
U. Cleanliness of streets and sidewalks		3.74	0.0274	1201	87
		3.66	0.0221	1134	82
V. Uncrowded conditions		3.53	0.0311	1184	85
		3.44	0.0240	1147	83



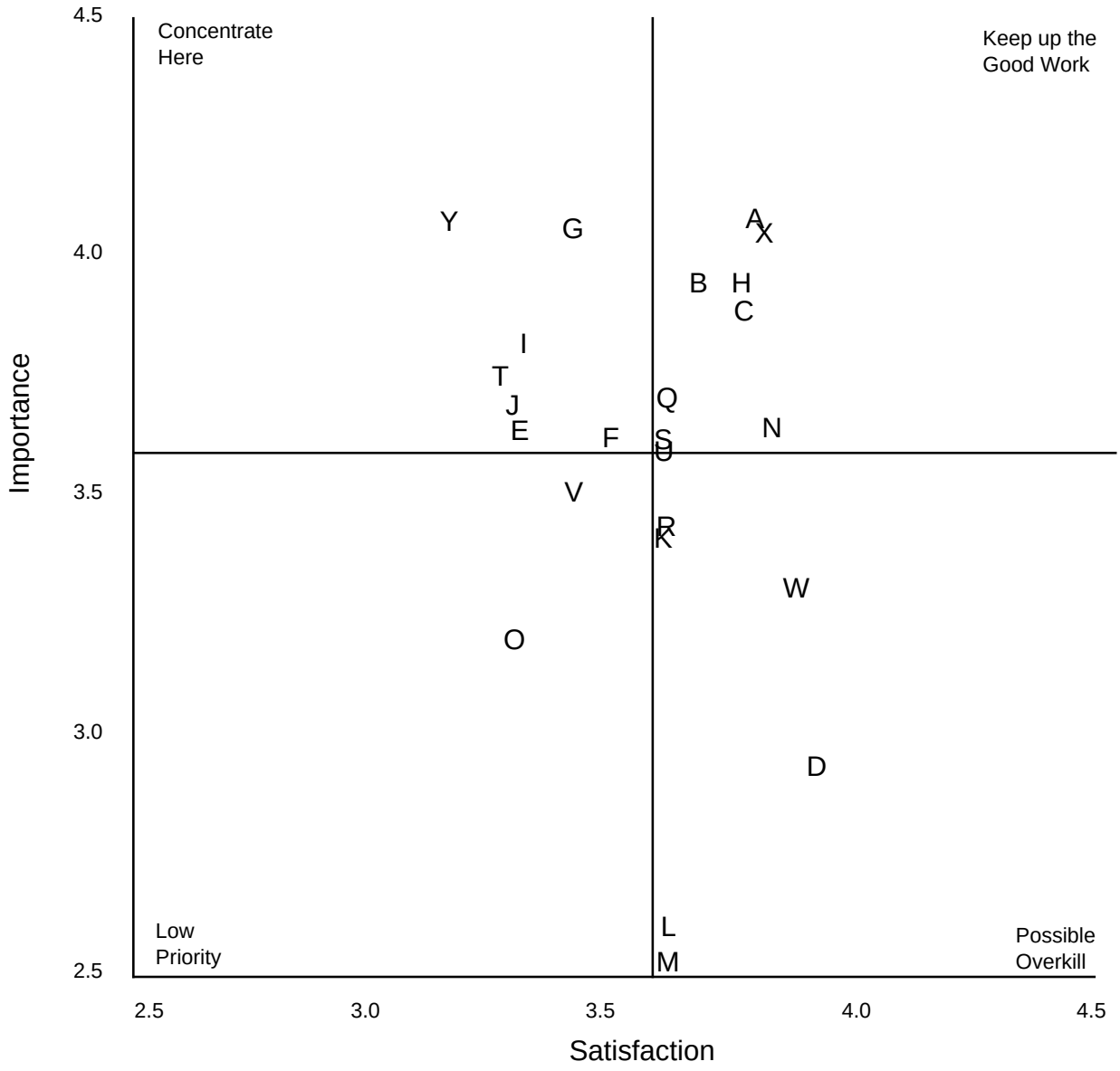
I - Importance, S - Satisfaction

Table A.1 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Any Natural Resource-based Activities, June 1995 - May 1996 (Continued)

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information		3.34	0.0333	1173	85
		3.85	0.0249	980	71
X. Service and friendliness of people		4.11	0.0252	1214	88
		3.88	0.0224	1159	84
Y. Value for the price		4.13	0.0254	1204	87
		3.27	0.0248	1147	83

I - Importance, S - Satisfaction

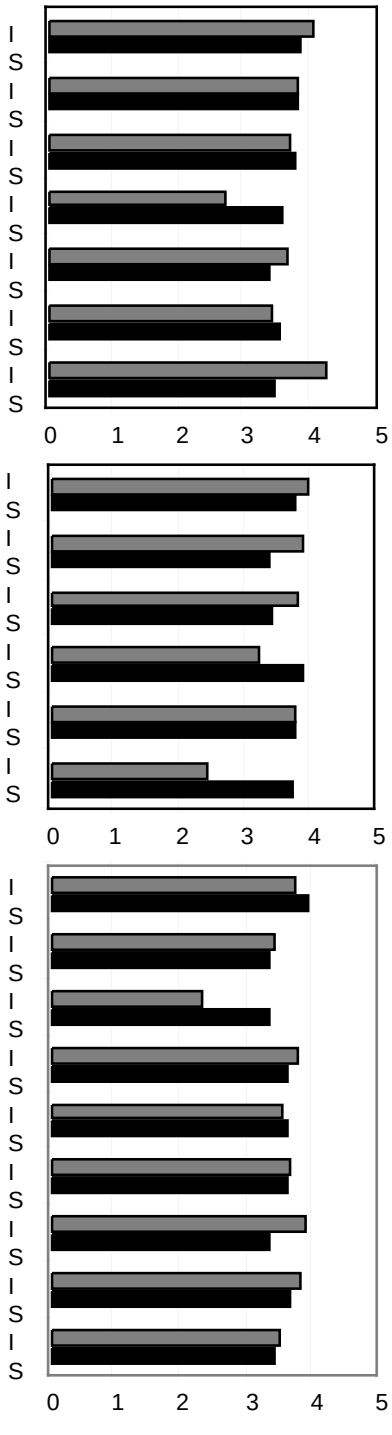
Importance/Satisfaction Matrix: Visitors that Did Any Natural Resource-based Activities, June 1995 - May 1996[1]



1. Item P., Public Transportation does not appear because it's importance score is less than 2.5.

Table A.2 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Any Non-natural Resource-based Activities, June 1995 - May 1996

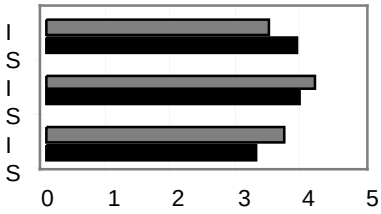
Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources					
A. Clear water (high visibility)		4.01	0.0271	1216	87
		3.82	0.0256	1125	80
B. Amount of living coral on reefs		3.75	0.0368	1097	78
		3.77	0.0303	699	50
C. Many different kinds of fish and sea life to view		3.66	0.0330	1207	86
		3.74	0.0278	857	61
D. Many different kinds of fish and sea life to catch		2.68	0.0446	1061	76
		3.60	0.0380	481	34
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)		3.60	0.0323	1216	87
		3.32	0.0327	853	61
F. Large numbers of fish		3.36	0.0368	1145	82
		3.55	0.0329	720	51
G. Qualtiy of beaches		4.22	0.0259	1256	89
		3.45	0.0291	1020	73
Natural Resource Facilities					
H. Parks and specially protected areas		3.90	0.0275	1246	89
		3.73	0.0228	928	66
I. Shoreline access		3.85	0.0285	1222	87
		3.35	0.0270	1000	71
J. Designated swimming/beach areas		3.79	0.0307	1235	88
		3.40	0.0285	955	68
K. Mooring buoys near coral reefs		3.13	0.0467	910	65
		3.82	0.0407	381	27
L. Marina facilities		2.53	0.0404	963	69
		3.75	0.0313	468	33
M. Boat ramps/launching facilities		2.39	0.0410	922	66
		3.68	0.0412	329	23
Other Facilities					
N. Historic preservation (historic landmarks, houses, etc.)		3.77	0.0280	1284	91
		3.92	0.0222	1085	77
O. Parking		3.58	0.0317	1194	85
		3.30	0.0287	992	71
P. Public Transportation		2.42	0.0390	1057	75
		3.38	0.0403	506	36
Q. Directional Signs, street signs, mile markers		3.76	0.0287	1294	92
		3.61	0.0258	1234	88
R. Condition of bike paths and sidewalks/ walking paths		3.57	0.0301	1215	87
		3.62	0.0249	927	66
S. Condition of roads and streets		3.63	0.0268	1295	92
		3.59	0.0202	1247	89
T. Availability of public restrooms		3.90	0.0269	1287	92
		3.31	0.0257	1103	79
U. Cleanliness of streets and sidewalks		3.81	0.0281	1299	93
		3.64	0.0217	1213	86
V. Uncrowded conditions		3.49	0.0292	1271	91
		3.45	0.0233	1221	87



I - Importance, S - Satisfaction

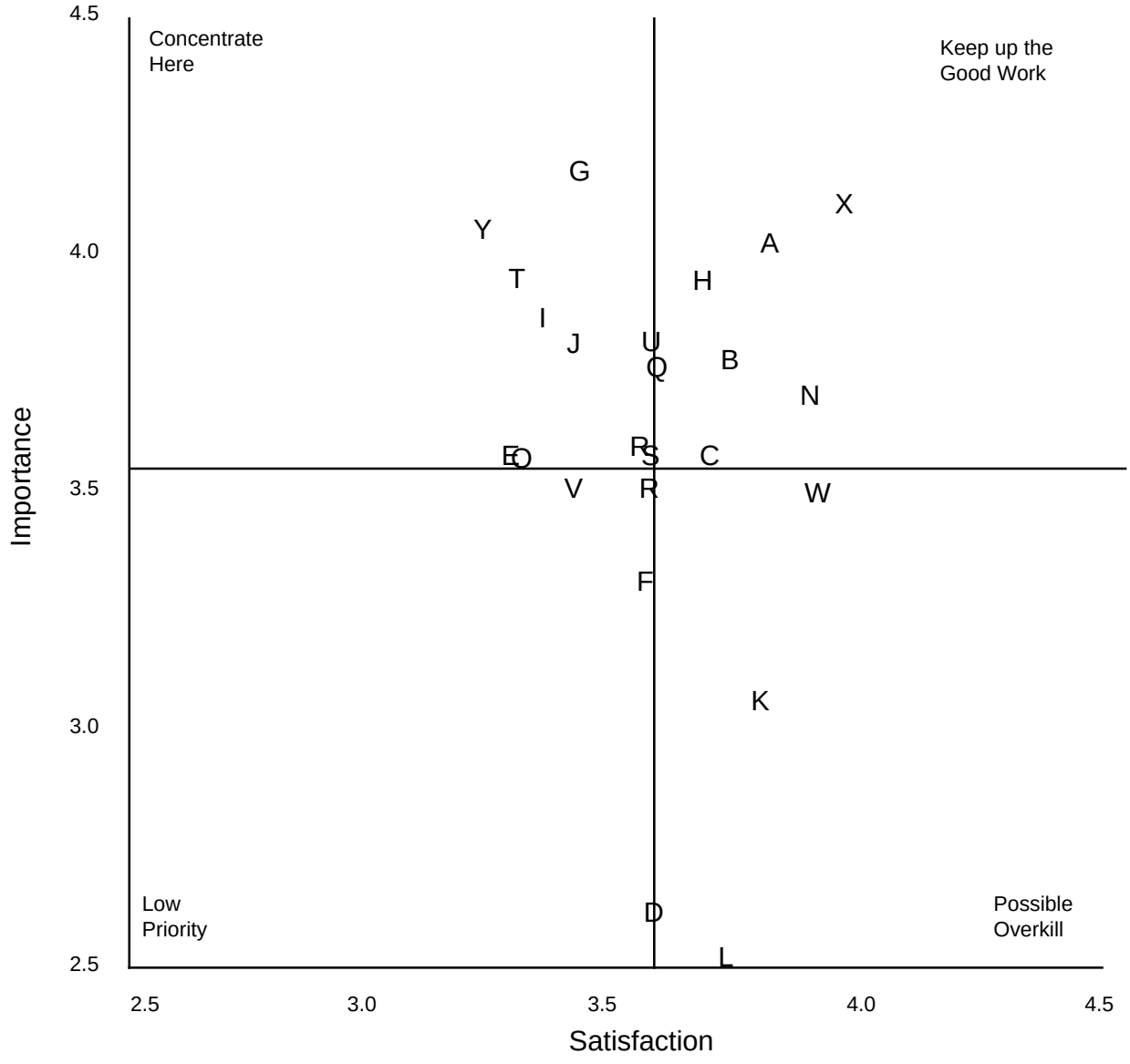
Table A.2 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Any Non-natural Resource-based Activities, June 1995 - May 1996 (Continued)

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information	I	3.45	0.0294	1257	90
	S	3.89	0.0221	1065	76
X. Service and friendliness of people	I	4.17	0.0227	1306	93
	S	3.94	0.0214	1245	89
Y. Value for the price	I	4.13	0.0239	1287	92
	S	3.27	0.0242	1207	86



I - Importance, S - Satisfaction

Importance/Satisfaction Matrix: Visitors that Did Any Non-natural Resource-based Activities, June 1995 - May 1996[1]

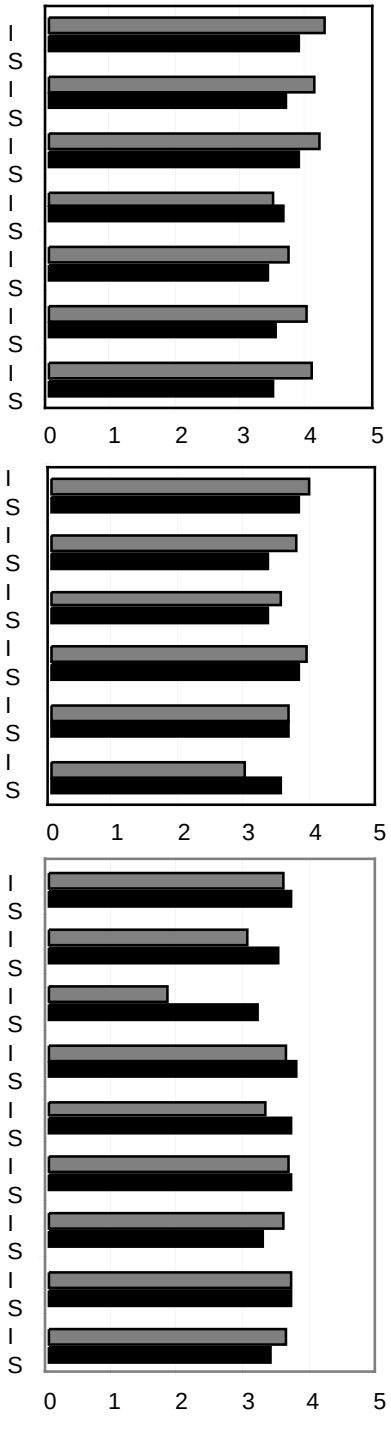


1. Items M. and P. do not appear because their importance score is less than 2.5.

1. Items M. and P. do not appear because their importance score is less than 2.5.

Table A.3 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Only Natural Resource-based Activities, June 1995 - May 1996

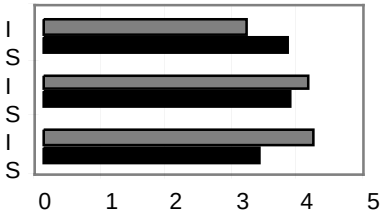
Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources					
A. Clear water (high visibility)		4.25	0.0520	343	91
		3.84	0.0516	337	89
B. Amount of living coral on reefs		4.07	0.0697	327	86
		3.63	0.0543	264	70
C. Many different kinds of fish and sea life to view		4.12	0.0581	338	89
		3.83	0.0466	302	80
D. Many different kinds of fish and sea life to catch		3.45	0.0930	330	87
		3.59	0.0643	236	62
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)		3.66	0.0700	346	91
		3.37	0.0669	269	71
F. Large numbers of fish		3.94	0.0656	336	89
		3.47	0.0607	278	73
G. Qualtiy of beaches		4.04	0.0633	336	89
		3.45	0.0587	274	72
Natural Resource Facilities					
H. Parks and specially protected areas		3.99	0.0602	346	91
		3.80	0.0504	265	70
I. Shoreline access		3.78	0.0682	334	88
		3.34	0.0621	272	72
J. Designated swimming/beach areas		3.53	0.0780	330	87
		3.61	0.0853	247	65
K. Mooring buoys near coral reefs		3.92	0.0800	299	79
		3.83	0.0680	190	50
L. Marina facilities		3.04	0.0825	309	82
		3.67	0.0515	214	56
M. Boat ramps/launching facilities		2.97	0.0865	305	80
		3.51	0.0694	180	47
Other Facilities					
N. Historic preservation (historic landmarks, houses, etc.)		3.57	0.0696	334	88
		3.72	0.0481	213	56
O. Parking		3.06	0.0674	325	86
		3.47	0.0530	276	73
P. Public Transportation		1.85	0.0775	276	73
		3.18	0.1094	89	23
Q. Directional Signs, street signs, mile markers		3.63	0.0639	350	92
		3.76	0.0475	334	88
R. Condition of bike paths and sidewalks/ walking paths		3.30	0.0775	317	84
		3.70	0.0999	235	62
S. Condition of roads and streets		3.67	0.0549	351	93
		3.70	0.0391	344	91
T. Availability of public restrooms		3.61	0.0635	345	91
		3.24	0.0586	269	71
U. Cleanliness of streets and sidewalks		3.70	0.0559	344	91
		3.71	0.0406	324	85
V. Uncrowded conditions		3.60	0.0606	341	90
		3.38	0.0487	325	86



I - Importance, S - Satisfaction

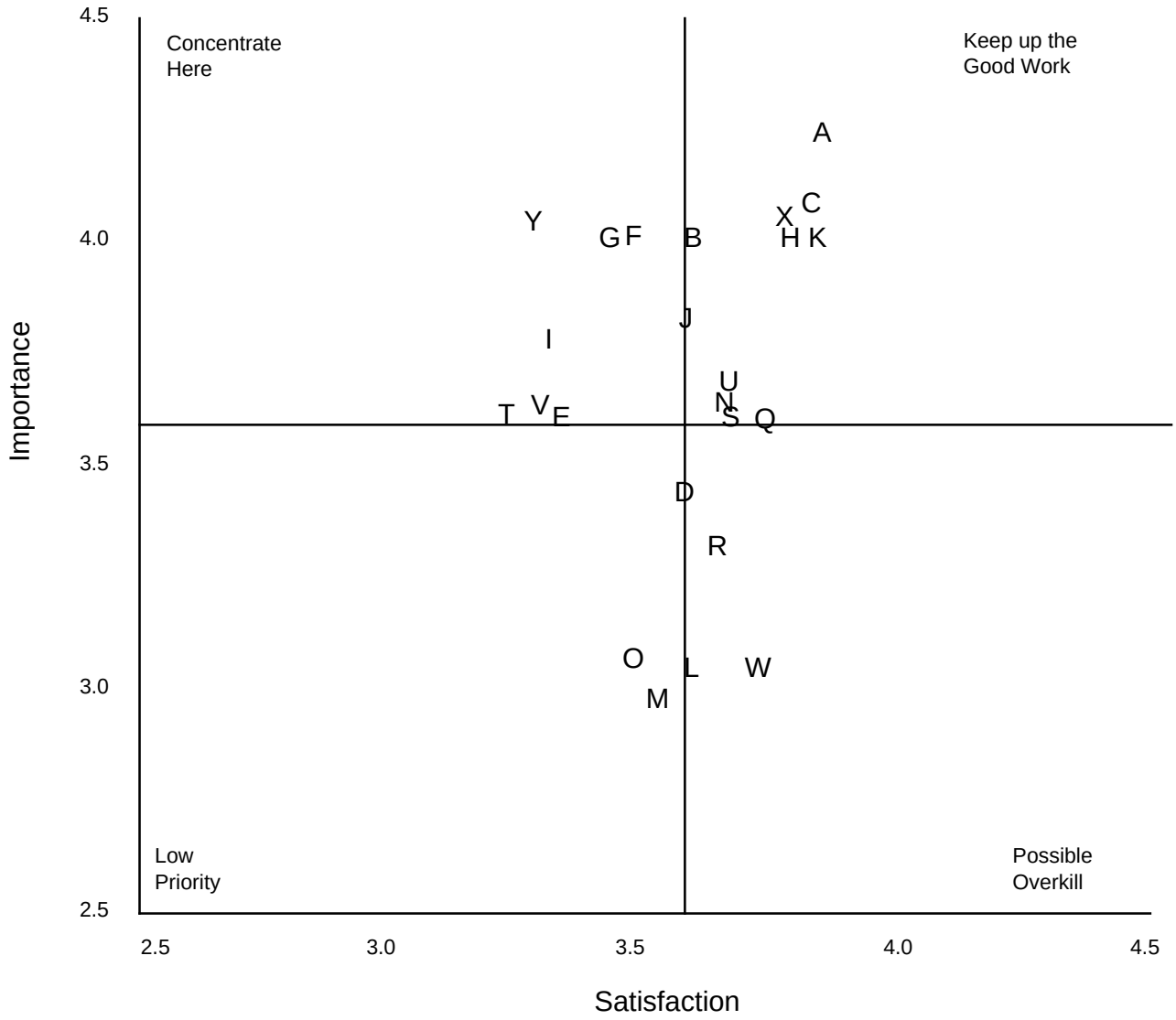
Table A.3 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Only Natural Resource-based Activities, June 1995 - May 1996

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information	I	3.12	0.0725	334	88
	S	3.75	0.0538	262	69
X. Service and friendliness of people	I	4.04	0.0534	353	93
	S	3.79	0.0434	325	86
Y. Value for the price	I	4.13	0.0505	348	92
	S	3.30	0.0458	332	88



I - Importance, S - Satisfaction

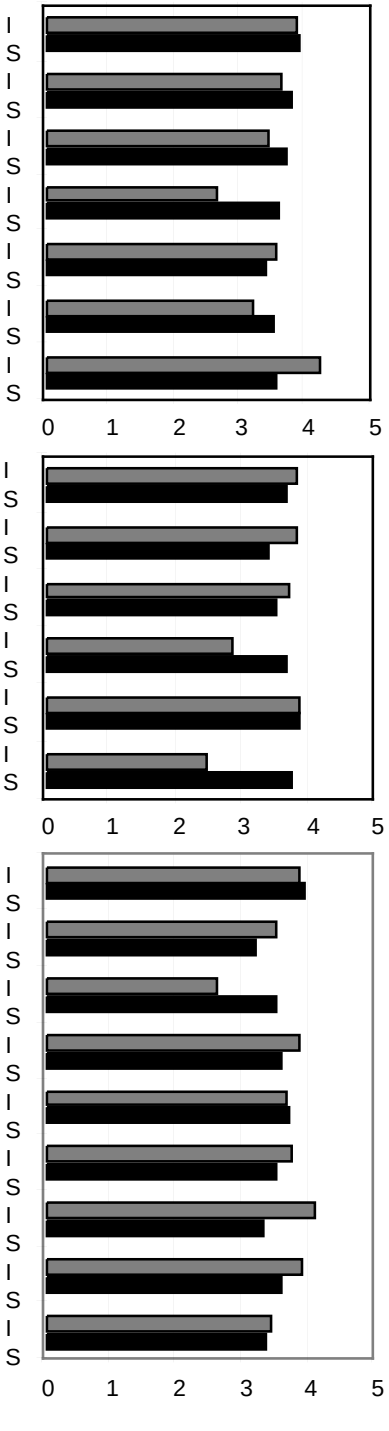
Importance/Satisfaction Matrix: Visitors that Did Only Natural Resource-based Activities, June 1995 - May 1996[1]



1. Item P., Public Transportation, does not appear because it's importance score is less than 2.5.

Table A.4 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Only Non-natural Resource-based Activities, June 1995 - May 1996

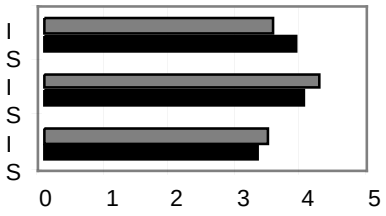
Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Natural Resources					
A. Clear water (high visibility)		3.86	0.0508	384	79
		3.89	0.0441	325	67
B. Amount of living coral on reefs		3.54	0.0691	323	67
		3.75	0.0578	142	29
C. Many different kinds of fish and sea life to view		3.44	0.0585	376	78
		3.68	0.0530	190	39
D. Many different kinds of fish and sea life to catch		2.51	0.0786	317	65
		3.61	0.0820	89	18
E. Opportunity to view large wildlife: (manatees, whales, dolphins, seaturtles)		3.51	0.0565	391	81
		3.36	0.0567	221	46
F. Large numbers of fish		3.19	0.0693	345	71
		3.52	0.0674	137	28
G. Qualtiy of beaches		4.22	0.0451	407	84
		3.54	0.0562	275	57
Natural Resource Facilities					
H. Parks and specially protected areas		3.81	0.0492	407	84
		3.65	0.0446	247	51
I. Shoreline access		3.84	0.0509	391	81
		3.41	0.0509	269	56
J. Designated swimming/beach areas		3.75	0.0547	393	81
		3.49	0.0564	238	49
K. Mooring buoys near coral reefs		2.85	0.0841	269	56
		3.61	0.0853	65	13
L. Marina facilities		2.64	0.0743	303	63
		3.86	0.0591	122	25
M. Boat ramps/launching facilities		2.45	0.0754	286	59
		3.71	0.0835	85	18
Other Facilities					
N. Historic preservation (historic landmarks, houses, etc.)		3.89	0.0470	441	91
		3.97	0.0389	373	77
O. Parking		3.43	0.0582	369	76
		3.18	0.0522	264	55
P. Public Transportation		2.78	0.0643	359	74
		3.59	0.0647	190	39
Q. Directional Signs, street signs, mile markers		3.78	0.0510	435	90
		3.60	0.0444	403	83
R. Condition of bike paths and sidewalks/ walking paths		3.68	0.0480	408	84
		3.70	0.0542	291	60
S. Condition of roads and streets		3.68	0.0461	438	90
		3.54	0.0367	416	86
T. Availability of public restrooms		4.07	0.0430	436	90
		3.28	0.0462	351	73
U. Cleanliness of streets and sidewalks		3.92	0.0419	442	91
		3.66	0.0382	403	83
V. Uncrowded conditions		3.47	0.0497	428	88
		3.40	0.0434	399	82



I - Importance, S - Satisfaction

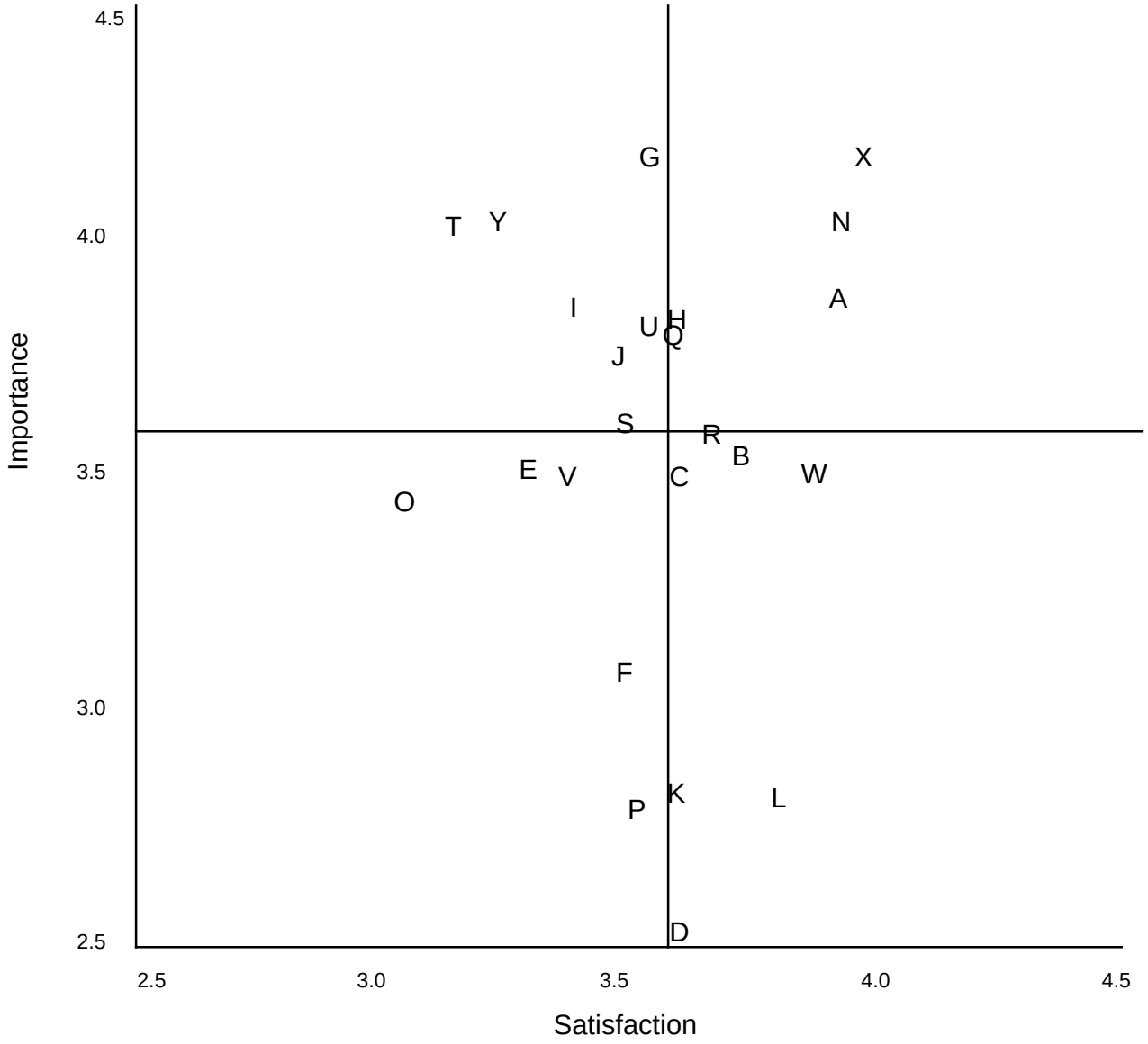
Table A.4 Importance/Satisfaction Matrix Code Descriptions, Graph of Means and Descriptive Statistics: Visitors that Did Only Non-natural Resource-based Activities, June 1995 - May 1996

Code from Matrix - Description	Graph of Mean	Mean	Standard Error	N	% Rated
Services					
W. Maps, brochures, and other tourist information		3.56	0.0508	418	86
X. Service and friendliness of people		3.86	0.0368	347	72
Y. Value for the price		4.22	0.0390	445	92
		3.98	0.0314	411	85
		4.12	0.0420	431	89
		3.31	0.0423	392	81



I - Importance, S - Satisfaction

Importance/Satisfaction Matrix: Visitors that Did Only Non-natural Resource-based Activities, June 1995 - May 1996[1]



1. Items M., Boat Ramps/launching Facilities does not appear because it's importance score is less than 2.5.