Socioeconomic Research and Monitoring Program

Importance and Satisfaction Ratings, A Five-Year Comparison (1995-96 to 2000-01)

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Goals

The goals of this project are to monitor and assess knowledge, attitudes, and perceptions of Sanctuary management strategies and regulations, specifically, to monitor and assess perceptions of the conditions of 25 natural resource attributes, facilities, and services by both residents of Monroe County and visitors to Monroe County and the FKNMS.

Methods

Five-year comparisons of mean importance and satisfaction scores were conducted for 25 natural resource attributes, facilities, and services (see Leeworthy et al. 2004). Baseline measurements were obtained in 1995-96 for both residents of Monroe County and visitors to Monroe County-FKNMS. This was done in the project entitled "Linking the Economy and the Environment of the Florida Keys/Florida Bay." The 1995-96 project serves as the baseline for the Recreation and Tourist component of the Socioeconomic Research and Monitoring Program for the FKNMS (for background description of the program and reports go to: http://marineeconomics.noaa.gov).

In the 2000-01 reef-user study, we were not able to replicate the Importance-Satisfaction ratings for all residents and visitors of Monroe County as was done in 1995-96. Instead we were able to take advantage of a multiple agency partnership to conduct the "Socioeconomic Study of Reefs in Southeast Florida, 2000-2001" (see Johns et al. 2003a for main report and Johns et al. 2003b for the technical appendix). This was a study of artificial and natural reefs off Palm Beach, Broward, Miami-Dade, and Monroe Counties. Through the Socioeconomic Research and Monitoring Program for the FKNMS, we were able to add several extra modules of questions to address issues in the FKNMS. The scope was limited to residents and visitors that engaged in boating activities and used either an artificial or natural reef. We were able to go back to the 1995-96 baseline databases and select those residents and visitors that engaged in boating activities so we could make five-year comparisons of mean importance and satisfaction scores for this group. Future plans call for a more complete replication of the 1995-96 study. This is tentatively planned for 2005-06.

Another important issue to note is that the same samples of resident and visitor populations were not surveyed in each iteration of the survey. In other words the respondents to the 1995-96 survey were not the same respondents to the 2000-01 survey. The implications of this include the potential for other factors, besides changes in the condition of the attributes, explaining the changes in ratings between time periods. These include changes in the demographic makeup and varying preferences of the 2000-01 sample compared to the 1995-96 sample. We account for this by also segmenting our samples by level of experience. Experienced users were defined as those with five or more years of experience.

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 most researchers now agree 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 Guadagnolo (1985), Richardson (1987), Hollenhorst et al. (1992), and Leeworthy and Wiley (1996, 1997).

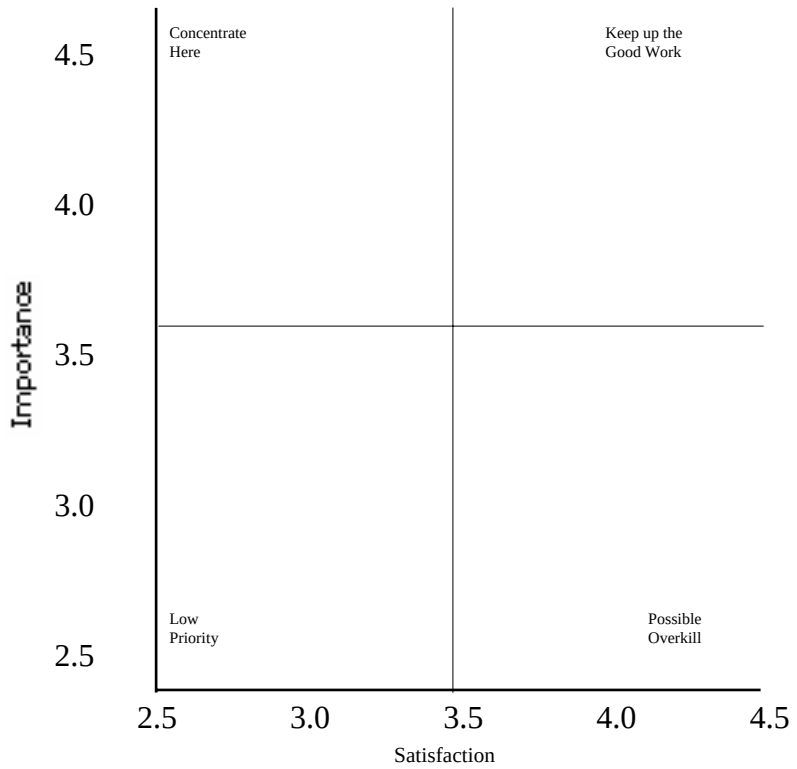
The satisfaction questionnaire was divided into two sections to obtain the necessary information for the importance-satisfaction analysis. The first section asked the respondent to read each statement and rate the importance of each of the 25 items as it contributes to an ideal recreation/tourist setting for the activities in which they participated in the FKNMS. Each item was rated or scored on a one to five scale 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 asked 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 where they did their activities in the FKNMS. 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."

There were 275 respondents in the 2000-01 visitors' survey and 917 respondents in the 1995-96 visitors' survey who had usable importance-satisfaction responses. There were 609 respondents in the 2000-01 resident survey and 455 respondents in the 1995-96 resident survey who had usable importance-satisfaction responses. In the analyses, these samples were treated as separate, independent samples.

Two-sample t-tests comparing mean importance and satisfaction scores were used with the 0.05 level of significance as the cut-off point for significance (95% confidence level). The tests were done for comparisons between years (1995-96 and 2000-01), and for 2000-01 between experienced and less-experienced users. Importance-satisfaction analysis was used for identifying key areas and priority areas of concern.

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 Fig. 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 FKNMS, we would still be able to judge the relative importance and satisfaction and establish priorities.

Figure 1. Importance/Satisfaction Matrix



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 labeled "**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 labeled "**Keep up the Good Work**." Scores falling in the lower left quadrant are relatively low on both the importance and satisfaction scale and are labeled "**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 labeled "**Possible Overkill**."

In general, the 25 items that residents and visitors were asked to rate are organized into four categories. In the survey, the order of the items was mixed. All of the items were assigned a letter (A through Y). Items A through G are labeled as "**Natural Resources**." These seven items are either natural resources or attributes of natural resources such as clear water. Items H through M are labeled as "**Natural Resource Facilities**." These six 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 labeled as "**Other Facilities**." These nine items are either facilities or features of facilities that are not directly related to natural resources but are indirectly related because they represent items associated with the general infrastructure of the area. Items W through Y are labeled as "**Services**." These three items are either services or features of a service provided to residents and 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 who have responsibilities in separate areas.

Findings

Summary results of the statistical test for differences in mean importance and satisfaction scores for all 25 natural resource attributes, facilities, and services for both resident and visitor samples are presented in Table 1. In Table 2, the results for comparing differences between experienced and less-experienced users are given for 2000-01.

Visitors

Importance

- 2000-01 boating visitors had significantly higher importance scores than the 1995-96 sample for 20 out of 25 attributes.
- More-experienced visitors had higher importance scores than less-experienced visitors for 5 out of 25 attributes, and lower scores for 2 out of 25 attributes.

Satisfaction

- 2000-01 boating visitors had significantly lower satisfaction scores than 1995-96 boating visitors for 24 out of 25 attributes.
- More-experienced visitors had lower satisfaction scores than less-experienced visitors for 18 of 25 attributes.

Residents

Importance

- 2000-01 boating residents had significantly lower importance score than the 1995-96 sample for 19 out of 25 attributes and a significantly higher importance score for one attribute.
- More-experienced residents had lower importance scores than less-experienced residents for 5 out of 25 attributes, and lower scores for six out of 25 attributes.

Satisfaction

- 2000-01 boating residents had significantly lower satisfaction scores than 1995-96 boating visitors for 24 out of 25 attributes.
- More-experienced residents had lower satisfaction scores than less-experienced residents for 3 out of 25 attributes.

Table 1. Comparisons of Importance-Satisfaction Scores: 1995-1996 and 2000-2001 Boating Samples

	Trend from 95-96 Sample, Boating Sample [2]							
	Visitors				Residents			
	Importance		Satisfaction		Importance		Satisfaction	
	Trend	Significance [1]	Trend	Significance [1]	Trend	Significance [1]	Trend	Significance [1]
I. Shoreline access	4.8%	**	-10.8%	**	-15.4%	**	-12.2%	**
H. Parks and specially protected areas	6.9%	**	-9.4%	**	-10.1%	**	-11.8%	**
J. Designated swimming/beach areas	8.8%	**	-9.6%	**	-13.4%	**	-14.6%	**
K. Mooring buoys near coral reefs	6.5%	**	-11.3%	**	-2.3%		-15.5%	**
D. Many different kinds of fish and sea life to catch	8.5%	**	-9.5%	**	7.5%	**	-11.3%	**
U. Cleanliness of streets and sidewalks	4.0%	**	-9.2%	**	-12.6%	**	-5.9%	**
B. Amount of living coral on reefs	8.3%	**	-10.4%	**	-2.6%	**	-14.2%	**
V. Uncrowded conditions	7.4%	**	-13.8%	**	0.8%		-13.9%	**
N. Historic preservation	7.3%	**	-8.7%	**	-13.0%	**	-13.4%	**
W. Maps, brochures, and other tourist info	7.1%	**	-8.9%	**	-16.8%	**	-14.3%	**
E. Opportunity to view large wildlife	10.1%	**	-12.5%	**	0.4%		-7.1%	**
L. Marina facilities	6.4%	*	-10.1%	**	-10.5%	**	-14.8%	**
F. Large Numbers of Fish	10.7%	**	-9.5%	**	-2.2%		-13.3%	**
O. Parking	7.3%	**	-11.8%	**	-30.3%	**	-8.5%	**
R. Condition of bike paths and sidewalks/paths	3.7%		-11.8%	**	-16.0%	**	-7.1%	**
G. Quality of beaches	5.7%	**	-11.5%	**	-5.4%	**	-16.6%	**
M. Boat ramps/launching facilities	1.6%		-13.3%	**	-15.8%	**	-13.3%	**
T. Availability of public restrooms	4.7%	**	-6.3%	**	-12.1%	**	-12.6%	**
S. Condition of roads and streets	2.4%		-10.0%	**	-19.4%	**	-6.1%	**
X. Service and friendliness of people	2.2%		-6.5%	**	-9.0%	**	-9.7%	**
Q. Directional signs, street signs, mile markers	3.4%		-10.7%	**	-23.3%	**	-12.7%	**
P. Public transportation	12.4%	**	-8.6%	**	-20.6%	**	0.1%	
Y. Value for the price	4.8%	**	-11.5%	**	-8.1%	**	-7.2%	**
C. Many different kinds of fish and sea life to view	9.6%	**	-10.0%	**	-1.8%		-10.2%	**
A. Clear Water (high visibility)	7.5%	**	-2.6%		-2.6%	**	-13.0%	**

1. Based on t-test. ** denotes significance at 5% level, * denotes significance at the 10% level.
2. Includes only those who participated in boating activities from the 95-96 sample.

Key Areas of Concern and Priority Areas of Concern

The importance-satisfaction analytical framework is used to identify key areas of concern, then to prioritize them. Figures 2 and 3 both present a series of three four-quadrant graphs. In both Figures 2 and 3, the first (left) graph plots attributes of the 1995-96 boating sample. The reason for the inclusion of these scores is, as mentioned above, the 2000-01 survey only included boaters. Therefore, this is the starting point to estimate the trend toward the 2000-01 samples. The middle graph plots the 2000-01 scores against the crosshairs of the 1995-96 boater sample mean scores. With this graph, the trend in scores is illustrated by showing the relative placement of 2000-01 scores to 1995-96 sample means. The left and middle graphs identify key areas of concern. The third (right) graph of each figure contains the 2000-01 scores plotted against the crosshairs of the 2000-01 sample. This is a static matrix and is used to gauge the relative perceptions of users in the 2000-01 sample and to identify priority areas of concern.

Table 2. Comparisons of Importance-Satisfaction Scores based on Experience: 2000-2001 Sample

	2000-2001 Sample Comparison Based on Experience [2]							
	Visitors				Residents			
	Importance		Satisfaction		Importance		Satisfaction	
	Comparis	Significance [1]	Comparis	Significance [1]	Comparis	Significance [1]	Comparis	Significance [1]
I. Shoreline access	0.9%		-11.0%	**	-12.8%	**	-5.6%	
H. Parks and specially protected areas	-1.8%		-12.7%	**	-7.0%		-5.3%	
J. Designated swimming/beach areas	-4.3%		-5.8%		-4.3%		-1.1%	
K. Mooring buoys near coral reefs	9.0%	*	-14.9%	**	-5.7%		-4.2%	
D. Many different kinds of fish and sea life to catch	24.3%	**	-12.1%	**	-3.5%		-4.9%	
U. Cleanliness of streets and sidewalks	-1.6%		-10.6%	**	-0.3%		6.6%	
B. Amount of living coral on reefs	4.4%		-10.8%	**	-0.2%		-2.4%	
V. Uncrowded conditions	-0.7%		-11.8%	**	0.3%		-10.3%	*
N. Historic preservation	-0.4%		-5.3%		-0.5%		-7.4%	
W. Maps, brochures, and other tourist info	-6.3%		-10.2%	**	1.0%		-9.1%	
E. Opportunity to view large wildlife	0.1%		-11.2%	**	-7.7%	**	7.7%	
L. Marina facilities	12.4%	*	1.6%		-3.6%		-8.2%	
F. Large Numbers of Fish	9.5%	**	-12.9%	**	-5.9%	*	-7.8%	
O. Parking	-3.8%		-11.3%	**	-16.4%	*	0.0%	
R. Condition of bike paths and sidewalks/paths	-2.3%		-10.8%	**	-2.9%		1.8%	
G. Quality of beaches	-4.7%		-6.3%		-1.7%		-6.3%	
M. Boat ramps/launching facilities	24.9%	**	4.1%		-3.0%		-11.8%	*
T. Availability of public restrooms	-6.3%	*	-9.3%	**	-7.8%		3.0%	
S. Condition of roads and streets	-1.3%		-13.7%	**	-6.5%		3.2%	
X. Service and friendliness of people	-4.8%	*	-10.4%	**	4.7%		-0.9%	
Q. Directional signs, street signs, mile markers	-2.9%		-5.5%		-16.6%	**	-6.0%	
P. Public transportation	-12.2%		-11.7%	*	-11.4%		-2.2%	
Y. Value for the price	0.6%		-9.2%	*	-4.4%		1.8%	
C. Many different kinds of fish and sea life to view	2.6%		-9.4%	**	-4.0%		-3.9%	
A. Clear Water (high visibility)	0.6%		-6.1%		-6.1%	**	-13.1%	**

1. Based on t-test. ** denotes significance at 5% level, * denotes significance at the 10% level.
2. Analysis is a comparison between those with less than five years to those with greater than, or equal to five years experience.
A "+" denotes a higher score with higher experience and a "-" denotes a lower score with higher experience.

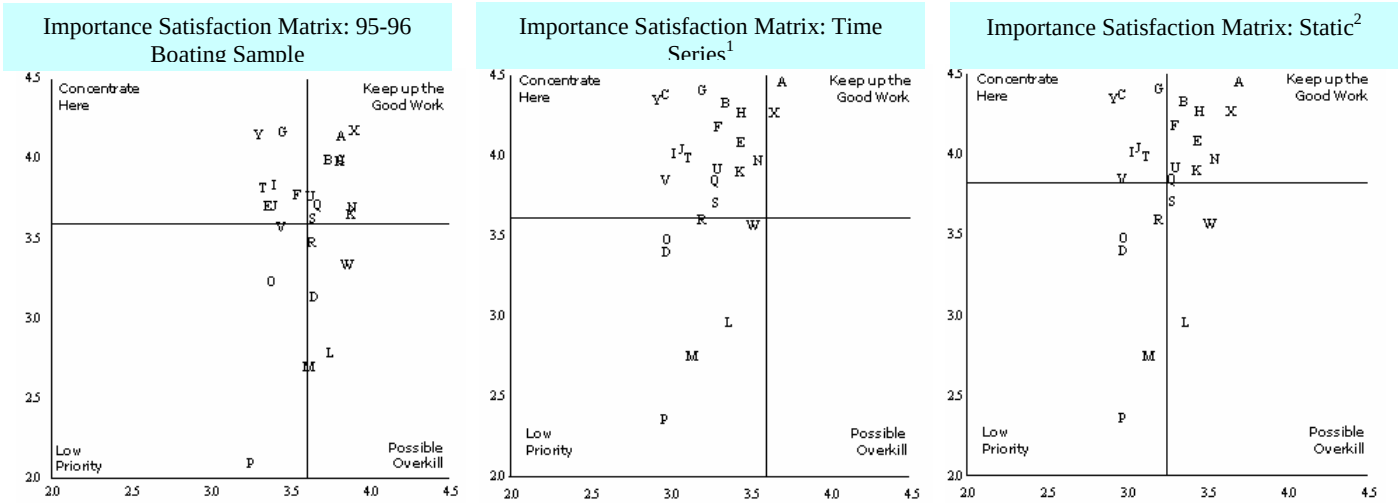


Figure 2. Importance-satisfaction matrices 1995-96 and 2000-01: visitor surveys.

1. This matrix shows the 2000-01 attributes plotted on the matrix; the mean score crosshairs are from the 1995-96 boating sample. The attributes of the 1995-96 boating sample are shown in the graph to the left. In this way the trend of each attribute is illustrated.
2. This matrix simply shows the 2000-01 attributes plotted with the 2000-01 mean score lines.

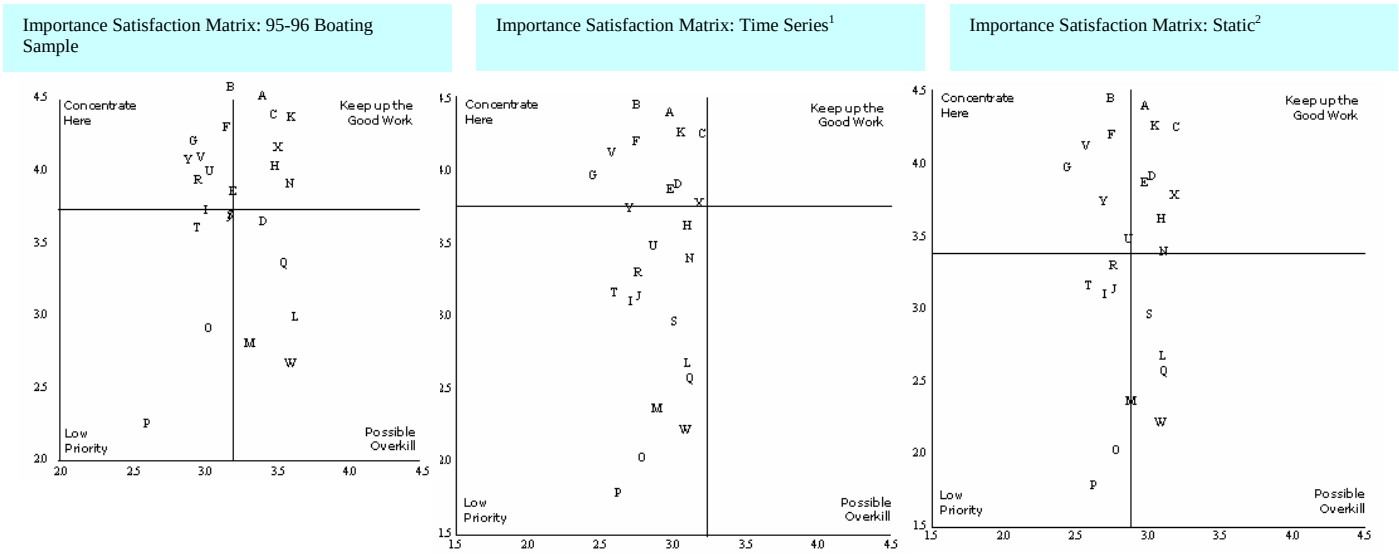


Figure 3. Importance-satisfaction matrices 1995-96 and 2000-01: resident surveys.

1. This matrix shows the 2000-2001 attributes plotted on the matrix; the mean score crosshairs are from the 1995-1996 boating sample. The plotted attributes of the 1995-1996 boating sample are shown in the graph to the left. In this way the trend of each attribute is illustrated.
2. This matrix simply shows the 2000-2001 attributes plotted with the 2000-2001 mean score lines.

Key Areas of Concern: Visitors

The results presented in the first two graphs in Figure 2 are summarized in Table 3. There has been a marked decline in satisfaction scores between the 1995-96 and 2000-01 survey periods. In the 1995-96 survey, there were seven attributes located in the "concentrate here" quadrant. In the 2000-01 survey, these same seven attributes remained in this quadrant and were joined by nine additional attributes. Additionally, five attributes moved from the "possible overkill" quadrant to the "low priority" quadrant, and two attributes were in the "low priority" quadrant in both survey periods. Finally, two attributes, A and X, were in the "keep up the good work" quadrant for both survey periods.

Table 3. Areas of concern: trends in attributes.
Visitor Survey

Concentrate Here			
1995-1996	2000-2001[1]		
E	B		***K***
F	C		N
G	E		Q
I	F		S
J	G	T	
T	H		***U***
Y	I	V[2]	
	J		Y

1. Attributes in red moved from "Keep up the Good Work" to "Concentrate Here" in 2000-2001
2. This attribute moved from "Low Priority" to "Concentrate Here"

Visitor Key Areas of Concern: 2000-01

Natural Resources
* Amount of living coral on the reefs
* Many different kinds of fish and sea life to view
  Opportunity to view large wildlife: manatees, whales, dolphins, and sea turtles
  Large numbers of fish
  Quality of beaches

Natural Resource Facilities
* Parks and specially protected areas
  Shoreline access
  Designated swimming/beach areas
* Mooring buoys near coral reefs

Other Facilities
* Historic preservation (historic landmarks, houses, etc.)
* Directional signs, street signs, mile markers
* Condition of roads and streets
  Availability of public restrooms
* Cleanliness of streets and sidewalks
* Uncrowded conditions

Services
Value for the Price

* Was not a key area of concern in 1995-96.

Key Areas of Concern: Residents

The results presented in the first two graphs in Figure 3 are summarized in Table 4. There has been a significant decline in satisfaction scores between the 1995-96 and 2000-01 survey periods. In the 1995-96 survey, there were nine attributes located in the "concentrate here" quadrant. In the 2000-01 survey, there were ten attributes in the "concentrate here" quadrant, five of which were in this quadrant in the 1995-96 survey, four of which moved from the "keep up the good work" category, and one attribute from the "possible overkill" category. Additionally, four attributes moved from the "concentrate here" quadrant to the "low priority" quadrant, four attributes moved from the "possible overkill" quadrant to the "low priority" quadrant, and five attributes were in the "low priority" quadrant in both survey periods. It is important to note that there are no 2000-01 attributes to the right of 1995-96 vertical mean satisfaction line in the middle graph, meaning there was no improvement in relative satisfaction ratings for any item.

Table 4. Areas of concern: trends in attributes.
Resident Survey

Concentrate Here			
1995-1996		2000-2001[1]	
B	R	A	F
E	U	*B*	G
F	V	C	*K*
G	Y	D[2]	V
I		E	*X*
			Y

1. Attributes in red moved from "Keep up the Good Work" to "Concentrate Here" in 2000-2001
2. Moved from "Possible Overkill" to "Concentrate Here"

Resident Key Areas of Concern: 2000-01

Natural Resources
* Clear water (high visibility)
Amount of living coral on the reefs
* Many different kinds of fish and sea life to view
* Many different kinds of fish and sea life to catch
Opportunity to view large wildlife: manatees, whales, dolphins, and sea turtles
Large numbers of fish
Quality of beaches

Natural Resource Facilities
* Mooring buoys near coral reefs

Other Facilities
* Uncrowded conditions

Services
* Service and friendliness of people
Value for the Price

* Was not a key area of concern in 1995-96.

Priority Areas of Concern

In Figures 2 and 3, the first two graphs were calibrated using 1995-96 baseline means for importance and satisfaction scores to analyze trends. In the third graph in each figure, the graph is calibrated using 2000-01 mean scores for importance and satisfaction. This allows us to assess the relative importance-satisfaction in 2000-01 to help establish priority areas of concern.

Priority Areas of Concern: Visitors

Ten attributes fell in the "keep up the good work" category, three attributes fell in the "possible overkill" category, and five attributes fell into the "low priority" category. Additionally, seven attributes fell into the "concentrate here" category. They are: C) Many different kinds of fish and sea life to view, G) Quality of beaches, I) Shoreline access, J) Designated swimming/beach areas, T) Availability of public restrooms, V) Un-crowded conditions, and Y) Value for the price.

Priority Areas of Concern for Visitors: 2000-01

Natural Resources
Many different kinds of fish and sea life to view
Quality of the beaches
Natural Resource Facilities
Shoreline access
Designated swimming/beach areas
Other Facilities
Availability of public restrooms
Uncrowded conditions
Services
Value for the Price

Priority Areas of Concern: Residents

Eight attributes fell in the "keep up the good work" category, four attributes fell in the "possible overkill" category, and seven attributes fell into the "low priority" category. Additionally, six attributes fell into the "concentrate here" category - these include: B) Amount of living coral on reefs, F) Large numbers of fish, G) Quality of beaches, U) Cleanliness of streets and sidewalks, V) Un-crowded conditions, and Y) Value for the price.

Priority Areas of Concern for Residents: 2000-01

Natural Resources
Amount of living coral on the reefs
Large numbers of fish
Quality of the beaches
Other Facilities
Cleanliness of streets and sidewalks
Uncrowded conditions
Services
Value for the Price

Interpretations and Conclusions

Interpretation of the results in this study requires a conceptual model. Such a model was provided in Leeworthy and Bowker (1997) and is reproduced here (see Fig. 4).

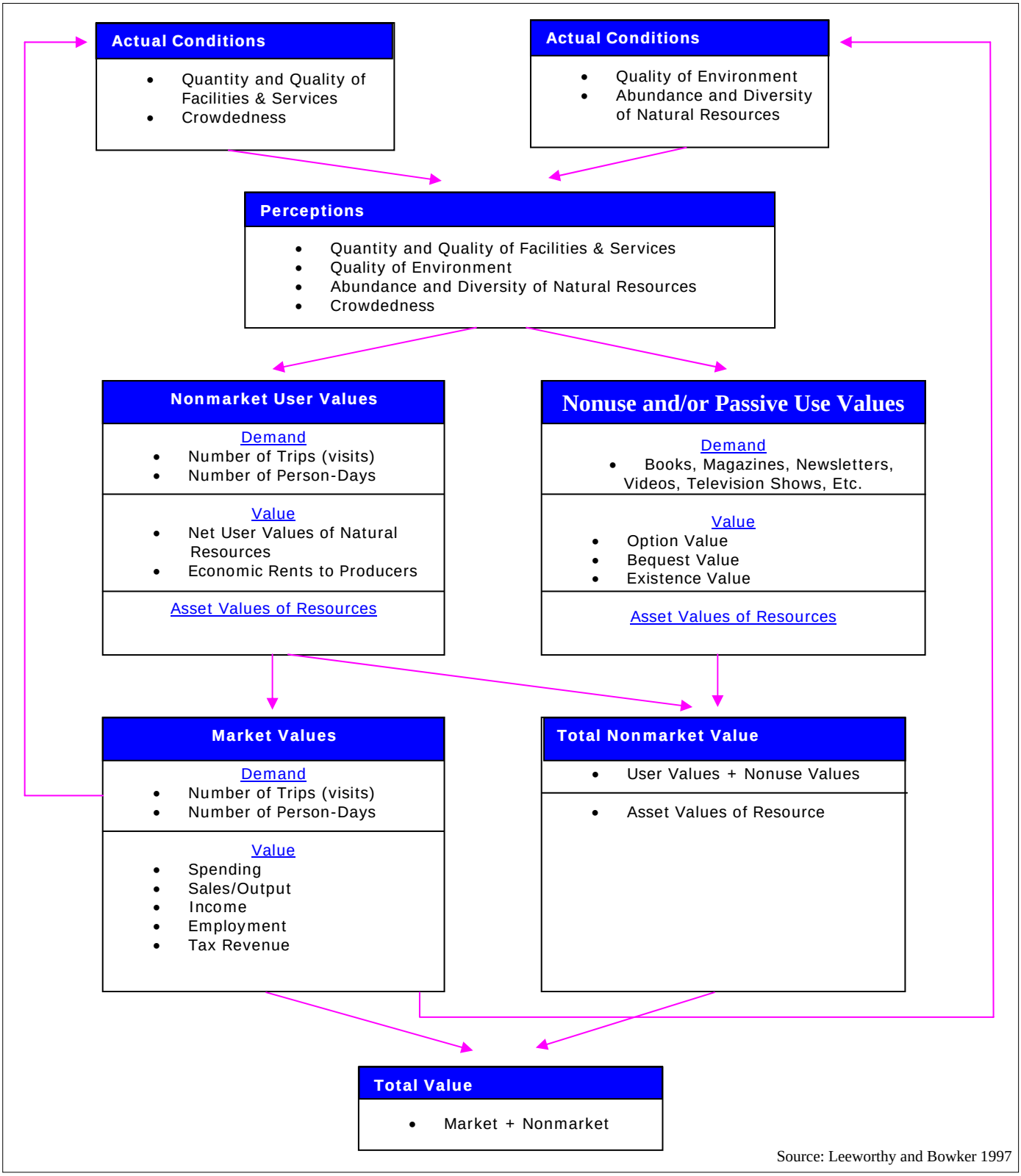


Figure 4. Conceptual model linking the economy and the environment.

The "Conceptual Model Linking the Economy and Environment" shows how both market and nonmarket economic values are linked to both "actual conditions" of the natural environment and the quantity and quality of facilities and services as well as people's "perceptions" of these conditions.

Although there is a direct connection between actual and perceptions of conditions and market and nonmarket economic values, there may be lags (delays in time) between perceptions of conditions and changes in their behavior and/or preferences, which lead to changes in demand and market and nonmarket economic values. Also, there may be differences in changes in actual conditions (as measured by ecological monitoring) and perceived conditions (as measured by socioeconomic monitoring).

Time delays in people's responses (lags) to changed conditions (actual or perceived) present opportunities. If actual or perceived conditions are in decline, there may be time to either correct actual conditions (i.e., make the necessary investments to improve conditions) or if there is a difference in actual and perceived conditions (ecological and socioeconomic monitoring results are not in agreement), then opportunities exist to apply education and outreach efforts to correct misperceptions. In both cases, the objective is to avoid negative economic outcomes.

Our results show that many key natural resource attributes, facilities, and services have increased in importance to people, while satisfaction with these natural resource attributes, facilities, and services has declined. Plugging these results into our conceptual model linking the economy and environment leads to potentially dire predictions of the future natural resource-based economy if actions are not taken to reverse these trends.

Another possible consequence of negative trends in satisfaction is the cost of attracting and educating "new" visitors. Our results show that for many natural resource attributes, facilities, and services, satisfaction ratings are not only in decline, they are also relatively lower for more-experienced visitors. The loss of repeat visitors raises the marketing costs of attracting "new" visitors and raises the costs of educating "new" visitors on how to interact with the areas' natural resources and support sustainable tourism. Borrowing a phrase from the clothing retailer Syms, "An educated consumer is our best customer."

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