



Knowledge, Attitudes and Perceptions of Florida Keys National Marine Sanctuary ZONES

Introduction

The information presented here is from a larger study of three user groups: commercial fishers, dive operators and environmental group members on their knowledge, attitudes and perceptions of management strategies and regulations in the Florida Keys National Marine Sanctuary (FKNMS). The study profiles these user groups and provides information on user group knowledge, attitudes and perceptions of FKNMS management strategies and regulations in the baseline 1995-96 period and how things have changed over a 10-year time period. Some new baselines are also established on new management strategies and regulations.

This fact sheet focuses on information obtained from dive operators on the FKNMS zones and includes zone definitions; dive operators' knowledge of the purpose of the FKNMS zones; dive operators' perceptions on the beneficiaries of the FKNMS zones; and dive operators' views on FKNMS zone outcomes. On this latter topic, information is reported on dive operators' views on FKNMS zone objectives and their support for FKNMS zones.

Purpose of Zones

In the baseline study, three purposes of the FKNMS zones were assessed, while five purposes were assessed in the 10-year replication. Also, in the baseline, there was no differentiation by type of zone, while in the 10-year replication three types of zones were assessed: Ecological Reserves (ERs), Sanctuary Preservation Areas (SPAs), and Wildlife Management Areas (WMAs). ERs and SPAs are two different forms of no-take areas. See inset box for definitions.

Zone Definitions

Ecological Reserves (ERs) encompass large, contiguous, diverse habitats, in order to protect and enhance natural spawning, nursery, and permanent-residence areas for the replenishment and genetic protection of fish and other marine life. Regulations for Ecological reserves are designed to meet the objectives of these zones by limiting consumptive activities while continuing to allow non-consumptive activities only where such activities are compatible with resource protection. There are currently two Ecological Reserves in the Sanctuary, the Western Sambos Ecological Reserve and the Tortugas Ecological Reserve.

Sanctuary Preservation Areas (SPAs) encompass discrete, biologically important areas and are designed to reduce user conflicts and sustain critical marine species and habitats. Regulations for SPAs are designed to limit consumptive activities while continuing to allow activities that do not threaten resource protection. There are 18 SPAs in the FKNMS.

Wildlife Management Areas (WMAs) include bird nesting, resting, or feeding areas, turtle-nesting beaches, and other sensitive habitats. Regulations are designed to protect these species or the habitat while providing for public use. Access restrictions may include no-access buffers, no-motor zones, idle-speed only/no wake zones, and closed zones. Some restrictions may apply to time periods, others to areas. There are currently 27 WMAs, of which 7 are managed exclusively by the FKNMS (the FKNMS co-manages the others with the US Fish and Wildlife Service).

Purpose of Zones	— 1996 —	— 2006 —		
	All Zones	ERs	SPAs	WMAs
1. Increasing overall fish stocks and biomass inside the zones.	83.9%	56.2%	60.9%	39.0%
2. Increasing overall fish stocks and biomass outside the zones.	59.7%	43.5%	37.7%	34.8%
3. Conserving and protecting corals, fish, and other marine life.	83.9%	56.2%	60.9%	39.0%
4. Resolving user group conflicts.	N/A	21.7%	40.6%	14.5%
5. Supporting scientific research.	N/A	52.2%	62.3%	37.7%

The percentages are not comparable across years because in the baseline respondents were simply asked if each of the purposes was a purpose of the zones, while in the 10-year replication respondents were asked which one of the five purposes was the main purpose of each type of zone. Thus, no statistical tests for differences were conducted.



Despite the limitations in direct comparisons, one can still make relative comparisons on what dive operators believed was the purpose of the zones, or in the 10-year replication, what was the purpose of each type of zone. Here new baselines are also established for future monitoring of the different types of zones.

In the baseline, a majority of dive operators thought that all three purposes for the zones were true. In addition, the overwhelming majority of dive operators thought it true that the purposes of the zones were “conserving and protecting corals, fish and other marine life” and “increasing overall fish stocks and biomass inside the zones”. Even though the majority of dive operators thought that “increasing overall fish stocks and biomass outside the zones” was a purpose of the zones, a significantly lower proportion did not buy the “replenishment effect” argument for the zones. The ERs were first proposed as “Replenishment Reserves” in the Draft Management Plan for the FKNMS that existed at the time of the baseline survey. The purposes and name were changed in the Final Management Plan.

In the 10-year replication, the user groups were asked to choose the “main” purpose of each type of zone among the five purposes presented. There are some notable shifts in beliefs about the purpose of the zones. A majority of all dive operators thought that “conserving and protecting corals, fish and other marine life” was the main purpose of the SPAs.

For ERs, dive operators had a majority of respondents select “conserving and protecting corals, fish and other marine life” or “increasing overall fish stocks and biomass inside the zones” as a main purpose. However, a majority of respondents did not select “increasing overall fish stocks and biomass outside the zones” as a main purpose of the ERs. This seems to reflect that dive operators did understand the change in purpose of the ERs as expressed in the change in name of the zones from the baseline. This purpose was just one possible purpose, not the “main” purpose of the ERs.

The main purpose of the SPAs was to resolve conflicts between consumptive and nonconsumptive users. Zoning was used by management to provide a place for each user group to be able to experience the resources of the FKNMS in conditions more suitable for their activities. The dive operators were one of the main beneficiaries of these zones and over 40% of them seemed to recognize that fact selecting this purpose as the “main” purpose of the zones versus resource protection purposes. Of course simple tallying of responses on main purpose doesn’t capture the synergetic effects of management strategies and regulations. By restricting access to consumptive uses, the conditions of the sites improve. This then provides places where nonconsumptive users can have better places to conduct their activities. This then helps solve conflicts between consumptive and nonconsumptive users.

Dive operators were the only user group where a majority of respondents chose “scientific research” as a “main” purpose of the ERs and SPAs.

The WMAs are not used by the dive operators so these zones are of less interest to this user group. A high proportion of survey respondents answered “don’t know” for most questions about WMAs.

Perceived Beneficiaries of the FKNMS Zones

The study surveys identified four potential beneficiaries of the FKNMS zones and asked survey respondents which of these groups they thought were the beneficiaries of the zones. Again, in the baseline study all types of zones were combined, whereas this was asked for each type of zone in the 10-year replication. The four groups of potential beneficiaries were commercial fishers, recreational/sport fishers, commercial dive operators, and recreational (local & tourist) divers. Dive operators were surveyed and therefore were asked how their group perceived themselves as benefiting from the zones.

Dive operators identified recreational divers as the group that most benefited from the zones in both the baseline and the 10-year replication. A majority of dive operators indicated that the both they and recreational divers in general were the main beneficiaries of the SPAs. Dive operators are major users of the SPAs. SPA use accounted for 69.3% of total trips and 93% of all zone-specific trips taken by the dive operators. Fewer respondents agreed that consumptive users, such as commercial and recreational fishers, had been the primary beneficiaries of the zone closures, and these views were similar in both time periods.

Zone Beneficiaries	— 1996 —	2006		
	All Zones	ERs	SPAs	WMAs
1. Commercial Fishers	24.2%	27.5%	30.4%	27.5%
2. Recreational/Sport Fishers	35.5%	30.4%	34.8%	15.9%
3. Commercial Dive Operators	N/A	43.5%	59.4%	31.9%
4. Recreational divers (local & tourists)	38.7%	46.4%	75.4%	35.5%

Views on FKNMS Zone Outcomes

FKNMS Zone Objectives. Dive operators were asked a core set of eight questions on their views of zone outcomes both in the baseline and 10-year replication surveys. The first two questions of the eight core questions address whether respondents agreed that the zones have achieved various objectives. Five questions address support for the zones across all regions and within each region of the Florida Keys. The last core question asked whether there should be more zones.

The tense of these questions was different in the baseline and 10-year replication surveys. In the baseline, the questions were worded such that the zones “will” accomplish the objectives, whereas in the 10-year replication the wording is as above assessing if they have accomplished the objectives. Again, a five-point agreement scale was used where 1=strongly agree to 5=strongly disagree. A “Don’t Know” response was also allowed, but was not included in statistical tests for changes in mean scores over the 10-year period. Statistical tests were done to test whether there were statistically significant changes in these views over the 10-year period. A “YES” means statistically significant difference with 95% confidence for each pairwise comparison between 1996 and each type of zone in 10-year replication. Tests were done for differences in distributions of percent responses and differences in mean scores. In summary tables A= percent that strongly and moderately agree and D=percent that strongly and moderately disagree. An * indicates a high proportion of “Don’t Know” responses, which are eliminated in comparison of mean scores, but retained in percentage responses.

Zone Objectives	— 1996 —	2006			Statistical Difference
	All Zones	ERs	SPAs	WMAs	
1. FKNMS zones have reduced conflicts between different user groups.	49.2% D (3.44)	33.8% D (2.12)	50.7% D (2.44)	30.4% D (2.52)	YES (YES)
2. FKNMS zones have been effective in restoring coral reefs in the Florida Keys to what they use to be.	49.1% D (3.33)	33.3% D (3.16)	43.5% D (3.11)	27.4% D (3.07)	NO (NO)

- mean scores and statistical difference of mean scores in parentheses.

In the baseline, a plurality of dive operators had negative expectations on the zones achieving the two objectives to reduce conflicts between user groups or restore the coral reefs to what they used to be (49.2% and 49.1%, respectively). In the 10-year replication, the negative views moved in a positive direction for both objectives, but the movements were only statistically significant for reducing conflicts between user groups. A majority (50.7%) believe the SPAs have reduced conflicts between user groups. Again, the dive operators are major users of the SPAs, minor users of the ERs, and do not use the WMAs. The low use of the ERs and WMAs explains the high proportion of “Don’t Know” responses for these types of zones.

Support for FKNMS Zones. Four statements were used in both the baseline and the 10-year replication on support for the FKNMS zones, while two were only asked in the 10-year replication. Again, the five point agreement scale was used.

Support Statements	— 1996 —	— 2006 —			Statistical Difference
	All Zones	ERs	SPAs	WMAs	
1. I support the establishment of FKNMS zones as they are currently established.	42.6% D (3.11)	55.1% A (1.90)	72.5% A (1.84)	48.8% A (1.91)	YES (YES)
2. I support the establishment of FKNMS zones in the Upper Keys.	65.5% A (2.37)	46.4% A (2.00)	62.3% A (3.01)	44.9% A (1.85)	NO (NO)
3. I support the establishment of FKNMS zones in the Middle Keys.	63.9% A (2.36)	44.9% A (1.91)	59.4% A (1.91)	44.9% D (1.76)	NO (NO)
4. I support the establishment of zones in the Lower Keys.	70.5% A (2.26)	46.3% A (2.02)	59.4% A (1.93)	44.9% A (1.86)	NO (NO)
5. I support the establishment of zones in the Dry Tortugas.	N/A	46.3% A (2.06)	59.4% A (2.05)	44.9% A (1.88)	N/A
6. There should be more FKNMS zones in the Florida Keys.	N/A	46.3% A (2.17)	59.4% A (2.34)	44.9% A (2.02)	N/A

In the baseline, a plurality of dive operators did not support the FKNMS zones as proposed (42.6% against and 40.9% for). However, when asked about the zones in each region, there was overwhelming support in each region (65.5% for zones in the Upper Keys; 63.9% for zones in the Middle Keys; and 70.5% for zones in the Lower Keys). In the 10-year replication, dive operators moved significantly in a positive direction for zones as currently established with a majority supporting ERs (55.1%) and SPAs (72.5%) and a plurality supporting WMAs (48.8%). Support for zones in each region was maintained with no statistically significant changes.

A majority of the dive operators supported establishment of SPAs in the Dry Tortugas (59.4%), while a plurality supported ERs (46.3%) and WMAs (44.9%). A high proportion of “Don’t Know” responses were provided for ERs and WMAs, this is expected since they only lightly use ERs and don’t use WMAs. Also, a moderate percent of dive operators were neutral across all types of zones in the Dry Tortugas: 8.7% for ERs; 14.5% for SPAs; and 8.7% for WMAs. A relatively small percentage was unsupportive of zones in the Dry Tortugas: 11.6% for ERs; 8.6% for SPAs; and 7.2% for WMAs. So overall, dive operators were very supportive of zones in the Dry Tortugas.

A majority of dive operators were supportive of more SPAs (59.4%), while a plurality supported more ERs (46.3%) and WMAs (44.9%). The percentages of those who did not support more zones were the same as for zones in the Dry Tortugas. So overall, dive operators were supportive of more zones in the Florida Keys.

Dive Operators were asked four more questions about FKNMS zones. The questions (statements) addressed the support for Special Use Areas (SUAs), which are zones set aside for research and education and in which diving would be prohibited; whether there should be more SUAs; whether zones have led to better diving conditions; and whether their use of the zones have increased since establishment of the FKNMS. Only the questions on SUAs and the question on diving conditions were asked in the baseline study.

SUA Support - Question (Statement)	1996	2006	Statistical Difference
1. I support establishment of Special-use Areas (SUAs) in the FKNMS.	54.1% A (2.92)	63.8% A (2.11)	YES (YES)
2. There should be additional SUAs in the FKNMS.	55.7% D (3.72)	39.1% A (2.71)	YES (YES)

- mean scores and statistical difference of mean scores in parentheses.

A majority of dive operators supported SUAs in both time periods; however, there was a statistically significant movement towards greater support over the 10-year period. When asked about whether there should be additional SUAs in the FKNMS, in the baseline a majority of dive operators were against it (55.7%), while in the 10-year replication a plurality supported more SUAs (39.1% for, 24.7% against, 20.3% neutral and 15.9% responded “Don’t Know”). This represented a statistically significant change in support for more SUAs.

Dive Conditions/Zone Use – Question (Statement)	— 1996 —	— 2006 —			Statistical Difference
	All Zones	ERs	SPAs	WMAs	
1. FKNMS zones have led to better diving conditions in the Florida Keys, such as healthy coral, more abundant marine life, and clearer water.	54.1% A (2.93)	42.0% A (2.50)	55.1% A (2.50)	36.2% A (2.51)	YES (YES)
2. My use of FKNMS zones has increased since their establishment.	N/A	28.9% A (2.62)	39.5% A (2.68)	23.2% A (2.64)	N/A

- mean scores and statistical difference of mean scores in parentheses.

The first question (statement) was asked in the baseline study, while the second wasn't. In the baseline, a majority of dive operators were optimistic that the zones would improve diving conditions with 54.1% agreeing with the statement in question 1. Views on this became more negative for all zones, except SPAs which the dive operators use extensively. For SPAs there was a small but insignificant positive movement (54.1% to 55.1%).

The second question (statement) returned a result that might suggest to some that dive operators are not supportive of the zones. However, the study actually obtained estimates of use and spatial use throughout the FKNMS, including the zones. The data show significant increases in use of the zones, primarily the SPAs. About 18.5% of all dive operators increased their use of the zones, while 4.6% reported declines in use. But 76.9% did not change their use and they were already significant users of the zones. In the answer to question 2, a plurality of dive operators did indicate that they increased their use of the zones, especially the SPAs (39.1%). The explanation for the apparent difference in results is that the dive operators that account for a larger share of dive use increased their use of the SPAs, while many smaller operations did not.

Access to Full Report and Executive Summary

The full report can be cited as follows:

Shivlani, M., Leeworthy V.R., Murray, T.J., Suman, D.O., and Tonioli, F. 2008. Knowledge, Attitudes and Perceptions of Management Strategies and Regulations of the Florida Keys National Marine Sanctuaries by Commercial Fishers, Dive Operators, and Environmental Group Members: A Baseline Characterization and 10-year Comparison. Marine Sanctuaries Conservation Series ONMS-08-06. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 170pp.

Available at: <http://sanctuaries.noaa.gov/science/conservation/pdfs/kap2.pdf>

Full Report and Executive Summary are also available in portable document format (pdf) from:

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