

THANK YOU!

for
participating in this
Recreation Survey

Dear Visitor,

During your recent trip to the Florida Keys you indicated that you would be willing to complete this questionnaire. It is self-explanatory and should not take long to complete. **Please** record your answers accurately and legibly. Your answers represent many other people not included in this survey effort so it is **very important** that you return your questionnaire.

Your answers are voluntary and confidential. Your name will never be released to anyone unless otherwise required by law. After the completion of the project all materials identifying you as an individual will be destroyed.

When you complete the questionnaire, please reverse-fold it so that our return address on the GREEN PAGE in the inside is folded to the outside. Please staple or tape to seal the questionnaire and mail it back to us. No postage is needed. Your cooperation in this effort is greatly appreciated.

Sincerely,

Please note: It is very important that the same person who participated in the on-site interview also complete this questionnaire.

Coral reefs are sensitive ecosystems. The Florida Keys, the world's third-largest barrier reef and the only coral reef system along the US mainland coast, is no exception. It has long been recognized that human use of coral reefs and adjacent coastal activities inflict strains on these systems. Non-local factors associated with global human use of the planet's resources add to the strain through their impact on air and sea temperatures.

The Florida Keys National Marine Sanctuary (FKNMS) was founded through a Federal Act to manage issues such as the above. It is managed cooperatively by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida, with significant input from local government, businesses, non-government organizations and the general public. Your views are valuable in the formulation of FKNMS action plans and management strategies.

This mail survey explores your knowledge, attitudes and perceptions of the natural reefs of the Florida Keys. There are no right or wrong answers; we simply want your honest opinion. Again, your privacy will be protected. No one will be given information that will allow them to identify you from survey data.

[This page intentionally left blank. Proceed to next page.]

I. Please read each statement and rate the *importance* of each item during your recent visit in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

IMPORTANCE
(with each of these items during
your recent visit)

				Not Applicable	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5	

2. In the previous question you rated the importance of a list of items during your recent visit. Now please read each of the items on this list and rate how *satisfied* you were with each during your recent visit. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

			Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5

In this section we have a few special issues questions we would like to ask you.

3. Was your recent visit your first visit to the Florida Keys?

_____ Yes (go to Question 6) _____ No (go to Question 4)

4. When was your previous most recent visit to the Florida Keys?

- 20+ years ago
- 10-19 years ago
- 5-9 years ago
- More recently

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

5. Please cast your mind back to your previous most recent visit and rate *how satisfied you were then* with the same items in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

		Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A) Clear water (high visibility)	n/a	dk	1	2	3	4	5	
B) Amount of living coral on reefs	n/a	dk	1	2	3	4	5	
C) Many different kinds of fish and sea life to view	n/a	dk	1	2	3	4	5	
D) Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles)	n/a	dk	1	2	3	4	5	
E) Large numbers of fish	n/a	dk	1	2	3	4	5	
F) Specially protected areas	n/a	dk	1	2	3	4	5	
G) Mooring buoys near coral reefs	n/a	dk	1	2	3	4	5	
H) Maps, brochures and other tourist information	n/a	dk	1	2	3	4	5	
I) Customer service and friendliness of people	n/a	dk	1	2	3	4	5	
J) Value for the price	n/a	dk	1	2	3	4	5	

6. What do you think are the greatest threats to the reefs in the Florida Keys in the following list? Please rank greatest threat=1, second-greatest threat=2, third-greatest threat=3, and so on for as many factors as you consider **important threats**. **Leave blank those you consider unimportant.**

- Spear fishers
- Scuba divers
- Urban development
- Ships and boats grounding on reefs, discharging pollutants
- Hurricanes
- Solid waste disposal (sewage)
- Climate change (global warming etc)
- Stormwater and wastewater runoff
- Overfishing by commercial and recreational fishers
- Number of tourists
- Chemical runoff (pesticides, herbicides, fertilizers)
- People collecting coral and live rock

7. Any other important factors we have omitted from the list?

If any, write in _____

8. What in your opinion should the Marine Sanctuary (FKNMS) do to reduce the main stress factors on the reef? Please rank your first recommendation=1, second=2, and so on for all recommendations you consider important. **Leave those blank that you consider unimportant.**

- Stringent control of pollutants to preserve water quality.....
- Enforced training/certification of scuba divers and snorkelers
- Prohibiting spear fishing.....
- Stronger shipping regulations.....
- Training, workshops and school programs.....
- Better management of waterways.....
- More no-catch fishing zones in the FKNMS.....

9. Do you have any other important recommendations on how FKNMS could reduce the main stress factors on the reef?

If any, write in _____

• The main signs of coral stress are coral diseases and **coral bleaching**.

- The coral organism lives in a mutually dependent (symbiotic) relationship with tiny algae known as *zooxanthellae*. Their health is highly dependent on temperature and the coral expels them when the sea temperature gets above a certain level. This causes the coral to turn white and weaken, the phenomenon known as coral bleaching.
- There is general agreement among scientists that the world's climate is getting warmer and that this may cause large sections of the world's coral reefs to die.
- There is also a general consensus that control of other stress factors can make the coral organisms more resilient (able to resist and/or recover from stressful events).

10. Were you aware of coral bleaching before your recent visit, and if so to what extent?

- Highly aware
 Conscious but not highly aware
 Became aware on my recent visit
 Still not aware (IF "Still not aware", go to Question 12.)
 All other answers proceed to Question 11.

11. What in your opinion is the primary cause of coral bleaching?
 (Check one only)

- Local factors exclusively
 Non-local factors such as
 global warming/climate change, exclusively
 Non-local factors aggravated by local factors
 Local factors aggravated by non-local factors
 I don't know

12. How important do you consider climate change to be for the world of the 21st century? Circle the number that corresponds to your answer.

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

13. And how important do you consider climate change to be for the future of the coral reefs in the Florida Keys?

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

The final part of this mail survey explores a number of alternative management actions that might be applied to protect the Florida Keys. There is general agreement among scientists that the impact of these actions will be to reduce coral bleaching, but not to eliminate it.

- Coral reefs are affected by global and local forces.
- Global climate change and resulting rises in seawater temperatures are considered a major factor in coral bleaching.
- When corals bleach, the corals die and live coral cover is reduced.
- Scientists have found that more coral cover and complexity of corals is associated with more abundant and larger fish, and many different kinds of fish and sea life.
- Emissions of greenhouse gases are considered the main source of global climate change and coral bleaching.
- Water pollution can stress corals and make them more susceptible to disease or reduce their ability to recover from stressful events such as storms or bleaching events.
- Excess nutrients can lead to algal growth, which smothers the corals and kills them.

We present three global alternatives for coral health measured by the amount of live coral cover, before considering local management policies that could be applied to lessen the impact of each global scenario. In the absence of local management policies, living **coral cover** of comparable quality to what exists today is reduced by (a) a massive 95% in 20 years (by 2027) in the worst case scenario, (b) by 80% (intermediate case) or (c) by 50% (best case). Case (a) assumes that there is no further change in global strategies to reduce global warming, and that the average global temperature will increase by 6-8°C by the year 2100. In the intermediate case (b), the increase over the 21st century will be 4°C, and (c) using the most efficient policies nationally and internationally, there will be a 2°C increase in the average global temperature.

- Local forces also affect the health of coral reefs.
- Users can touch, step on, or drop their anchors on the corals.
- Fishermen can overfish a reef and remove fish species that eat algae that can smother and kill the corals.

Local Management Strategies

There are four local strategies included in the FKNMS management plan designed to protect the health of the coral reefs. For each strategy, we present three levels of protection. The no change from current policy is always the low cost strategy.

1. **Education and outreach** are important activities in the FKNMS. The goal is to promote protection and sustainable use of Sanctuary reserves, and public understanding of the nature of marine sanctuaries. Activities include school programs, local community meetings, signage and exhibits in visitor centers, brochures, and TV and radio announcements. Team Ocean, a group of local volunteers, is provided with a FKNMS boat and fuel. They patrol the FKNMS and when they observe someone violating FKNMS rules and regulations, they educate them about how their activity harms the corals. Team Ocean and education and outreach staff also visit local businesses and distribute information on how users can better interact with corals to avoid damages. Education is also an integral element of other programs in the management plan and is considered a low-cost alternative to enforcement.

2. **Enforcement** includes a wide range of measures such as introducing no-anchor zones for vessels above a certain length, reinforcement of bans on spear fishing and touching corals, educating scuba divers and snorkelers about the reefs and enforcing reef protection, and restricting the use of personal vessels on or near the reef. It also involves the mooring buoy program set up around the restricted areas within the Sanctuary.

3. **Water quality** is a crucial issue as reflected by the FKNMS management plan: “Declining water quality continues to be a major concern for the Sanctuary.” Remedies include the development and implementation of wastewater and stormwater plans, efficient options to reduce loading of sediment, toxics and nutrients which damage water quality and the reef, targeting hot spots of industrial and commercial facilities, and reducing pollution from vessels and marinas. Improving water quality is a significantly higher-cost activity than the other items in this list.

4. **Zoning:** There are currently 24 no-take zones in the FKNMS. They cover less than five percent of FKNMS waters, but protect about 60% of the corals. Scientific monitoring of these zones has determined that coral health, fish abundance, size and diversity of fish and sea life have improved in protected areas versus non protected areas. The three levels of protection are (a) no change; or (b) 25% increase in coral cover protected, from 60% to 75%; or (c) 50% increase in coral cover protected, from 60% to 90%.

Reflecting current FKNMS management principles of running several parallel strategies, we have reduced these four policy options to two by combining education and outreach, enforcement, and water quality management into one group, with the options of (a) no change, (b) 5% increase in annual spending, and (c) 10% increase in annual spending. Zoning remains a separate strategy, with three possible levels of protection as shown above.

- A combination of global and local management strategies is required to save the health of the coral reefs.
- Scientists believe that global policies to minimize the increase in greenhouse gases are required to lower sea water temperatures from what they would otherwise have been, and so reduce coral bleaching.
- The more efficient the global strategy to reduce greenhouse gases, the more cost-efficient will be local management actions to protect the reef.
- If local forces are not addressed, the corals will not recover from coral bleaching when or if cooler waters return.
- Policies to reduce the increase in greenhouse gases will result in increased costs to your household through higher utility bills and the costs of products or services.
- Local management strategies will result in increased costs to your household if you are a resident or visitor to the Florida Keys. Costs will be passed on in terms of higher State and local taxes, local water/sewage bills and the costs of local goods and services purchased in the Florida Keys
- We have worked with scientists and managers to estimate the approximate annual costs to your household for the different mixes of global and local management strategies which scientists think will deliver some protection to the corals. The costs to your household are stated in dollars per year.

Questions 14-19 contain six multiple-choice situations to which you are asked to state your preferences and provide a brief explanation for your choices. Each choice presents different mixes of global and local management strategies and has an estimated cost to your household. Each choice always includes the option of choosing the status quo or NO CHANGE (Alt A). This alternative will cost your household \$0, but will result in 95% reduction in the amount of live coral cover in 20 years, and local actions such as improving water quality and increasing the no-take areas will become much less efficient.

Each choice will be similar to the following example. Alt A is always the no-change situation as just explained. Alt B assumes an intermediate global policy for greenhouse gas reduction, and Alt C is based on a stronger and costlier global policy. In each Alt B and C case, different combinations of local management strategies have been designed which yield different coral cover outcomes at different costs to your household, giving you three choices.

We can't help you state your preferences, which depend on your own experience and attitudes. We don't know the extent of your concern about future climate change, how much value you put on the quality of the coral reefs relative to other attractions of the Florida Keys, and the main activities that attracted you there including fishing, boating, snorkeling, and land-based activities. So the example below is purely illustrative, and has nothing whatever to do with what you actually think. It's just an example to assist you in answering questions 14-19.

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	75%	44%
Total annual cost to your household for global and local strategies	\$0	\$67	\$80
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please explain briefly why you made this choice (for example): “I like to fish, and clear water is important. But I would prefer to have more open area to fish on the reefs.”

Please note the following general assumptions when you make your choices:

- The most efficient local management strategy is centered on improving water quality, supplemented by efficient education and enforcement policies. This strategy is also the most expensive local strategy.
- Protecting the reef by increasing the area of no-take zones is also efficient but less so. This relatively low-cost option will reduce reef-fishing activities (but fishing opportunities may be unaffected or may even increase elsewhere in the FKNMS).
- The less efficient the global greenhouse gas strategy to control the rise in sea temperatures, the less efficient the local management strategies will also be.
- Making a choice to spend money on protecting the amount of living coral on the reefs will mean that you have less money to spend on other goods and services.

14. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	76%	44%
Total annual cost to your household for global and local strategies	\$0	\$65	\$95
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

15. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	79%	38%
Total annual cost to your household for global and local strategies	\$0	\$27	\$100
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

16. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	79%	50%
Total annual cost to your household for global and local strategies	\$0	\$27	\$75
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

17. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	76%	40%
Total annual cost to your household for global and local strategies	\$0	\$50	\$115
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

18. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 75%
Coral cover loss by 2027, Florida Keys	95%	75%	40%
Total annual cost to your household for global and local strategies	\$0	\$67	\$97
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

19. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	79%	40%
Total annual cost to your household for global and local strategies	\$0	\$27	\$115
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

In the survey we conducted with you on-site on your recent visit to the Florida Keys, you told us how many days you spent in the Florida Keys over the past 12 months. In the next set of questions, we would like you to tell us how many days less you would have visited the Florida Keys if coral cover conditions had been worse than they currently are.

Currently, 6% of the entire water area in the FKNMS is covered with living coral.

20. If the living coral cover were only 3% (half the current coral cover), how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

[This page intentionally left blank. Proceed to next page.]

21. If there was no coral cover left or 0% coral cover, how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

Thank you very much for your cooperation in this important survey.

That's All!! If you would like to be entered into a sweepstakes to win a free Vacation to the Florida Keys, fill out your name, address and phone number below. All prizes will be awarded in October of 2007.

Name: _____

Address: _____

City: _____

State: _____ Zip: _____ Phone: _____

Prizes to be awarded are:

GRAND PRIZE

- * Airfare for two from anywhere in the continental United States to the Florida Keys
- * Rental car with unlimited miles for one week (seven days)
- * Accommodations for two for one week (six nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

FIRST PRIZE

- * Accommodations for two for five days (four nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for four days (three nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for three days (two nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)

This is a cooperative research project of the Monroe County Tourist Development Council and the National Oceanic and Atmospheric Administration. Public reporting burden for this collection of information is estimated to average 20 minutes including time for reviewing instructions, searching existing data sources, gathering and maintaining the data need, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to U.S. Department of Commerce, Clearance Officer, Office of Chief Information Officer, Rm. 6625, 14th and Constitution Avenue NW, Washington, DC 20230. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subject to penalty for failure to comply with, a collection of information subject to requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

THANK YOU!

for
participating in this
Recreation Survey

Dear Visitor,

During your recent trip to the Florida Keys you indicated that you would be willing to complete this questionnaire. It is self-explanatory and should not take long to complete. **Please** record your answers accurately and legibly. Your answers represent many other people not included in this survey effort so it is **very important** that you return your questionnaire.

Your answers are voluntary and confidential. Your name will never be released to anyone unless otherwise required by law. After the completion of the project all materials identifying you as an individual will be destroyed.

When you complete the questionnaire, please reverse-fold it so that our return address on the GREEN PAGE in the inside is folded to the outside. Please staple or tape to seal the questionnaire and mail it back to us. No postage is needed. Your cooperation in this effort is greatly appreciated.

Sincerely,

Please note: It is very important that the same person who participated in the on-site interview also complete this questionnaire.

Coral reefs are sensitive ecosystems. The Florida Keys, the world's third-largest barrier reef and the only coral reef system along the US mainland coast, is no exception. It has long been recognized that human use of coral reefs and adjacent coastal activities inflict strains on these systems. Non-local factors associated with global human use of the planet's resources add to the strain through their impact on air and sea temperatures.

The Florida Keys National Marine Sanctuary (FKNMS) was founded through a Federal Act to manage issues such as the above. It is managed cooperatively by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida, with significant input from local government, businesses, non-government organizations and the general public. Your views are valuable in the formulation of FKNMS action plans and management strategies.

This mail survey explores your knowledge, attitudes and perceptions of the natural reefs of the Florida Keys. There are no right or wrong answers; we simply want your honest opinion. Again, your privacy will be protected. No one will be given information that will allow them to identify you from survey data.

[This page intentionally left blank. Proceed to next page.]

I. Please read each statement and rate the *importance* of each item during your recent visit in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

IMPORTANCE
(with each of these items during
your recent visit)

				Not Applicable	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5	

2. In the previous question you rated the importance of a list of items during your recent visit. Now please read each of the items on this list and rate how *satisfied* you were with each during your recent visit. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

			Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5

In this section we have a few special issues questions we would like to ask you.

3. Was your recent visit your first visit to the Florida Keys?

_____ Yes (go to Question 6) _____ No (go to Question 4)

4. When was your previous most recent visit to the Florida Keys?

- 20+ years ago
- 10-19 years ago
- 5-9 years ago
- More recently

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

5. Please cast your mind back to your previous most recent visit and rate *how satisfied you were then* with the same items in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

		Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A) Clear water (high visibility)	n/a	dk	1	2	3	4	5	
B) Amount of living coral on reefs	n/a	dk	1	2	3	4	5	
C) Many different kinds of fish and sea life to view	n/a	dk	1	2	3	4	5	
D) Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles)	n/a	dk	1	2	3	4	5	
E) Large numbers of fish	n/a	dk	1	2	3	4	5	
F) Specially protected areas	n/a	dk	1	2	3	4	5	
G) Mooring buoys near coral reefs	n/a	dk	1	2	3	4	5	
H) Maps, brochures and other tourist information	n/a	dk	1	2	3	4	5	
I) Customer service and friendliness of people	n/a	dk	1	2	3	4	5	
J) Value for the price	n/a	dk	1	2	3	4	5	

6. What do you think are the greatest threats to the reefs in the Florida Keys in the following list? Please rank greatest threat=1, second-greatest threat=2, third-greatest threat=3, and so on for as many factors as you consider **important threats**. **Leave blank those you consider unimportant.**

- Spear fishers
- Scuba divers
- Urban development
- Ships and boats grounding on reefs, discharging pollutants
- Hurricanes
- Solid waste disposal (sewage)
- Climate change (global warming etc)
- Stormwater and wastewater runoff
- Overfishing by commercial and recreational fishers
- Number of tourists
- Chemical runoff (pesticides, herbicides, fertilizers)
- People collecting coral and live rock

7. Any other important factors we have omitted from the list?

If any, write in _____

8. What in your opinion should the Marine Sanctuary (FKNMS) do to reduce the main stress factors on the reef? Please rank your first recommendation=1, second=2, and so on for all recommendations you consider important. **Leave those blank that you consider unimportant.**

- Stringent control of pollutants to preserve water quality.....
- Enforced training/certification of scuba divers and snorkelers
- Prohibiting spear fishing.....
- Stronger shipping regulations.....
- Training, workshops and school programs.....
- Better management of waterways.....
- More no-catch fishing zones in the FKNMS.....

9. Do you have any other important recommendations on how FKNMS could reduce the main stress factors on the reef?

If any, write in _____

• The main signs of coral stress are coral diseases and **coral bleaching**.

- The coral organism lives in a mutually dependent (symbiotic) relationship with tiny algae known as *zooxanthellae*. Their health is highly dependent on temperature and the coral expels them when the sea temperature gets above a certain level. This causes the coral to turn white and weaken, the phenomenon known as coral bleaching.
- There is general agreement among scientists that the world's climate is getting warmer and that this may cause large sections of the world's coral reefs to die.
- There is also a general consensus that control of other stress factors can make the coral organisms more resilient (able to resist and/or recover from stressful events).

10. Were you aware of coral bleaching before your recent visit, and if so to what extent?

- Highly aware
 Conscious but not highly aware
 Became aware on my recent visit
 Still not aware (IF "Still not aware", go to Question 12.)
 All other answers proceed to Question 11.

11. What in your opinion is the primary cause of coral bleaching?
 (Check one only)

- Local factors exclusively
 Non-local factors such as
 global warming/climate change, exclusively
 Non-local factors aggravated by local factors
 Local factors aggravated by non-local factors
 I don't know

12. How important do you consider climate change to be for the world of the 21st century? Circle the number that corresponds to your answer.

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

13. And how important do you consider climate change to be for the future of the coral reefs in the Florida Keys?

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

The final part of this mail survey explores a number of alternative management actions that might be applied to protect the Florida Keys. There is general agreement among scientists that the impact of these actions will be to reduce coral bleaching, but not to eliminate it.

- Coral reefs are affected by global and local forces.
- Global climate change and resulting rises in seawater temperatures are considered a major factor in coral bleaching.
- When corals bleach, the corals die and live coral cover is reduced.
- Scientists have found that more coral cover and complexity of corals is associated with more abundant and larger fish, and many different kinds of fish and sea life.
- Emissions of greenhouse gases are considered the main source of global climate change and coral bleaching.
- Water pollution can stress corals and make them more susceptible to disease or reduce their ability to recover from stressful events such as storms or bleaching events.
- Excess nutrients can lead to algal growth, which smothers the corals and kills them.

We present three global alternatives for coral health measured by the amount of live coral cover, before considering local management policies that could be applied to lessen the impact of each global scenario. In the absence of local management policies, living **coral cover** of comparable quality to what exists today is reduced by (a) a massive 95% in 20 years (by 2027) in the worst case scenario, (b) by 80% (intermediate case) or (c) by 50% (best case). Case (a) assumes that there is no further change in global strategies to reduce global warming, and that the average global temperature will increase by 6-8°C by the year 2100. In the intermediate case (b), the increase over the 21st century will be 4°C, and (c) using the most efficient policies nationally and internationally, there will be a 2°C increase in the average global temperature.

- Local forces also affect the health of coral reefs.
- Users can touch, step on, or drop their anchors on the corals.
- Fishermen can overfish a reef and remove fish species that eat algae that can smother and kill the corals.

Local Management Strategies

There are four local strategies included in the FKNMS management plan designed to protect the health of the coral reefs. For each strategy, we present three levels of protection. The no change from current policy is always the low cost strategy.

1. **Education and outreach** are important activities in the FKNMS. The goal is to promote protection and sustainable use of Sanctuary reserves, and public understanding of the nature of marine sanctuaries. Activities include school programs, local community meetings, signage and exhibits in visitor centers, brochures, and TV and radio announcements. Team Ocean, a group of local volunteers, is provided with a FKNMS boat and fuel. They patrol the FKNMS and when they observe someone violating FKNMS rules and regulations, they educate them about how their activity harms the corals. Team Ocean and education and outreach staff also visit local businesses and distribute information on how users can better interact with corals to avoid damages. Education is also an integral element of other programs in the management plan and is considered a low-cost alternative to enforcement.

2. **Enforcement** includes a wide range of measures such as introducing no-anchor zones for vessels above a certain length, reinforcement of bans on spear fishing and touching corals, educating scuba divers and snorkelers about the reefs and enforcing reef protection, and restricting the use of personal vessels on or near the reef. It also involves the mooring buoy program set up around the restricted areas within the Sanctuary.

3. **Water quality** is a crucial issue as reflected by the FKNMS management plan: “Declining water quality continues to be a major concern for the Sanctuary.” Remedies include the development and implementation of wastewater and stormwater plans, efficient options to reduce loading of sediment, toxics and nutrients which damage water quality and the reef, targeting hot spots of industrial and commercial facilities, and reducing pollution from vessels and marinas. Improving water quality is a significantly higher-cost activity than the other items in this list.

4. **Zoning:** There are currently 24 no-take zones in the FKNMS. They cover less than five percent of FKNMS waters, but protect about 60% of the corals. Scientific monitoring of these zones has determined that coral health, fish abundance, size and diversity of fish and sea life have improved in protected areas versus non protected areas. The three levels of protection are (a) no change; or (b) 25% increase in coral cover protected, from 60% to 75%; or (c) 50% increase in coral cover protected, from 60% to 90%.

Reflecting current FKNMS management principles of running several parallel strategies, we have reduced these four policy options to two by combining education and outreach, enforcement, and water quality management into one group, with the options of (a) no change, (b) 5% increase in annual spending, and (c) 10% increase in annual spending. Zoning remains a separate strategy, with three possible levels of protection as shown above.

- A combination of global and local management strategies is required to save the health of the coral reefs.
- Scientists believe that global policies to minimize the increase in greenhouse gases are required to lower sea water temperatures from what they would otherwise have been, and so reduce coral bleaching.
- The more efficient the global strategy to reduce greenhouse gases, the more cost-efficient will be local management actions to protect the reef.
- If local forces are not addressed, the corals will not recover from coral bleaching when or if cooler waters return.
- Policies to reduce the increase in greenhouse gases will result in increased costs to your household through higher utility bills and the costs of products or services.
- Local management strategies will result in increased costs to your household if you are a resident or visitor to the Florida Keys. Costs will be passed on in terms of higher State and local taxes, local water/sewage bills and the costs of local goods and services purchased in the Florida Keys
- We have worked with scientists and managers to estimate the approximate annual costs to your household for the different mixes of global and local management strategies which scientists think will deliver some protection to the corals. The costs to your household are stated in dollars per year.

Questions 14-19 contain six multiple-choice situations to which you are asked to state your preferences and provide a brief explanation for your choices. Each choice presents different mixes of global and local management strategies and has an estimated cost to your household. Each choice always includes the option of choosing the status quo or NO CHANGE (Alt A). This alternative will cost your household \$0, but will result in 95% reduction in the amount of live coral cover in 20 years, and local actions such as improving water quality and increasing the no-take areas will become much less efficient.

Each choice will be similar to the following example. Alt A is always the no-change situation as just explained. Alt B assumes an intermediate global policy for greenhouse gas reduction, and Alt C is based on a stronger and costlier global policy. In each Alt B and C case, different combinations of local management strategies have been designed which yield different coral cover outcomes at different costs to your household, giving you three choices.

We can't help you state your preferences, which depend on your own experience and attitudes. We don't know the extent of your concern about future climate change, how much value you put on the quality of the coral reefs relative to other attractions of the Florida Keys, and the main activities that attracted you there including fishing, boating, snorkeling, and land-based activities. So the example below is purely illustrative, and has nothing whatever to do with what you actually think. It's just an example to assist you in answering questions 14-19.

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	75%	44%
Total annual cost to your household for global and local strategies	\$0	\$134	\$160
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please explain briefly why you made this choice (for example): “I like to fish, and clear water is important. But I would prefer to have more open area to fish on the reefs.”

Please note the following general assumptions when you make your choices:

- The most efficient local management strategy is centered on improving water quality, supplemented by efficient education and enforcement policies. This strategy is also the most expensive local strategy.
- Protecting the reef by increasing the area of no-take zones is also efficient but less so. This relatively low-cost option will reduce reef-fishing activities (but fishing opportunities may be unaffected or may even increase elsewhere in the FKNMS).
- The less efficient the global greenhouse gas strategy to control the rise in sea temperatures, the less efficient the local management strategies will also be.
- Making a choice to spend money on protecting the amount of living coral on the reefs will mean that you have less money to spend on other goods and services.

14. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	76%	44%
Total annual cost to your household for global and local strategies	\$0	\$100	\$190
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

15. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	80%	40%
Total annual cost to your household for global and local strategies	\$0	\$50	\$230
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

16. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	74%	50%
Total annual cost to your household for global and local strategies	\$0	\$140	\$150
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

17. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	77%	40%
Total annual cost to your household for global and local strategies	\$0	\$94	\$230
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

18. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	From 60% to 75%
Coral cover loss by 2027, Florida Keys	95%	76%	40%
Total annual cost to your household for global and local strategies	\$0	\$130	\$194
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

19. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	78%	40%
Total annual cost to your household for global and local strategies	\$0	\$60	\$230
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

In the survey we conducted with you on-site on your recent visit to the Florida Keys, you told us how many days you spent in the Florida Keys over the past 12 months. In the next set of questions, we would like you to tell us how many days less you would have visited the Florida Keys if coral cover conditions had been worse than they currently are.

Currently, 6% of the entire water area in the FKNMS is covered with living coral.

20. If the living coral cover were only 3% (half the current coral cover), how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

[This page intentionally left blank. Proceed to next page.]

21. If there was no coral cover left or 0% coral cover, how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

Thank you very much for your cooperation in this important survey.

That's All!! If you would like to be entered into a sweepstakes to win a free Vacation to the Florida Keys, fill out your name, address and phone number below. All prizes will be awarded in October of 2007.

Name: _____

Address: _____

City: _____

State: _____ Zip: _____ Phone: _____

Prizes to be awarded are:

GRAND PRIZE

- * Airfare for two from anywhere in the continental United States to the Florida Keys
- * Rental car with unlimited miles for one week (seven days)
- * Accommodations for two for one week (six nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

FIRST PRIZE

- * Accommodations for two for five days (four nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for four days (three nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for three days (two nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)

This is a cooperative research project of the Monroe County Tourist Development Council and the National Oceanic and Atmospheric Administration. Public reporting burden for this collection of information is estimated to average 20 minutes including time for reviewing instructions, searching existing data sources, gathering and maintaining the data need, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to U.S. Department of Commerce, Clearance Officer, Office of Chief Information Officer, Rm. 6625, 14th and Constitution Avenue NW, Washington, DC 20230. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subject to penalty for failure to comply with, a collection of information subject to requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

THANK YOU!

for
participating in this
Recreation Survey

Dear Visitor,

During your recent trip to the Florida Keys you indicated that you would be willing to complete this questionnaire. It is self-explanatory and should not take long to complete. **Please** record your answers accurately and legibly. Your answers represent many other people not included in this survey effort so it is **very important** that you return your questionnaire.

Your answers are voluntary and confidential. Your name will never be released to anyone unless otherwise required by law. After the completion of the project all materials identifying you as an individual will be destroyed.

When you complete the questionnaire, please reverse-fold it so that our return address on the GREEN PAGE in the inside is folded to the outside. Please staple or tape to seal the questionnaire and mail it back to us. No postage is needed. Your cooperation in this effort is greatly appreciated.

Sincerely,

Please note: It is very important that the same person who participated in the on-site interview also complete this questionnaire.

Coral reefs are sensitive ecosystems. The Florida Keys, the world's third-largest barrier reef and the only coral reef system along the US mainland coast, is no exception. It has long been recognized that human use of coral reefs and adjacent coastal activities inflict strains on these systems. Non-local factors associated with global human use of the planet's resources add to the strain through their impact on air and sea temperatures.

The Florida Keys National Marine Sanctuary (FKNMS) was founded through a Federal Act to manage issues such as the above. It is managed cooperatively by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida, with significant input from local government, businesses, non-government organizations and the general public. Your views are valuable in the formulation of FKNMS action plans and management strategies.

This mail survey explores your knowledge, attitudes and perceptions of the natural reefs of the Florida Keys. There are no right or wrong answers; we simply want your honest opinion. Again, your privacy will be protected. No one will be given information that will allow them to identify you from survey data.

[This page intentionally left blank. Proceed to next page.]

I. Please read each statement and rate the *importance* of each item during your recent visit in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

IMPORTANCE
(with each of these items during
your recent visit)

				Not Applicable	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5

2. In the previous question you rated the importance of a list of items during your recent visit. Now please read each of the items on this list and rate how *satisfied* you were with each during your recent visit. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

				Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5	

In this section we have a few special issues questions we would like to ask you.

3. Was your recent visit your first visit to the Florida Keys?

_____ Yes (go to Question 6) _____ No (go to Question 4)

4. When was your previous most recent visit to the Florida Keys?

- 20+ years ago
- 10-19 years ago
- 5-9 years ago
- More recently

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

5. Please cast your mind back to your previous most recent visit and rate *how satisfied you were then* with the same items in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

		Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A) Clear water (high visibility)	n/a	dk	1	2	3	4	5	
B) Amount of living coral on reefs	n/a	dk	1	2	3	4	5	
C) Many different kinds of fish and sea life to view	n/a	dk	1	2	3	4	5	
D) Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles)	n/a	dk	1	2	3	4	5	
E) Large numbers of fish	n/a	dk	1	2	3	4	5	
F) Specially protected areas	n/a	dk	1	2	3	4	5	
G) Mooring buoys near coral reefs	n/a	dk	1	2	3	4	5	
H) Maps, brochures and other tourist information	n/a	dk	1	2	3	4	5	
I) Customer service and friendliness of people	n/a	dk	1	2	3	4	5	
J) Value for the price	n/a	dk	1	2	3	4	5	

6. What do you think are the greatest threats to the reefs in the Florida Keys in the following list? Please rank greatest threat=1, second-greatest threat=2, third-greatest threat=3, and so on for as many factors as you consider **important threats**. **Leave blank those you consider unimportant.**

- Spear fishers
- Scuba divers
- Urban development
- Ships and boats grounding on reefs, discharging pollutants
- Hurricanes
- Solid waste disposal (sewage)
- Climate change (global warming etc)
- Stormwater and wastewater runoff
- Overfishing by commercial and recreational fishers
- Number of tourists
- Chemical runoff (pesticides, herbicides, fertilizers)
- People collecting coral and live rock

7. Any other important factors we have omitted from the list?

If any, write in _____

8. What in your opinion should the Marine Sanctuary (FKNMS) do to reduce the main stress factors on the reef? Please rank your first recommendation=1, second=2, and so on for all recommendations you consider important. **Leave those blank that you consider unimportant.**

- Stringent control of pollutants to preserve water quality.....
- Enforced training/certification of scuba divers and snorkelers
- Prohibiting spear fishing.....
- Stronger shipping regulations.....
- Training, workshops and school programs.....
- Better management of waterways.....
- More no-catch fishing zones in the FKNMS.....

9. Do you have any other important recommendations on how FKNMS could reduce the main stress factors on the reef?

If any, write in _____

• The main signs of coral stress are coral diseases and **coral bleaching**.

- The coral organism lives in a mutually dependent (symbiotic) relationship with tiny algae known as *zooxanthellae*. Their health is highly dependent on temperature and the coral expels them when the sea temperature gets above a certain level. This causes the coral to turn white and weaken, the phenomenon known as coral bleaching.
- There is general agreement among scientists that the world's climate is getting warmer and that this may cause large sections of the world's coral reefs to die.
- There is also a general consensus that control of other stress factors can make the coral organisms more resilient (able to resist and/or recover from stressful events).

10. Were you aware of coral bleaching before your recent visit, and if so to what extent?

- Highly aware
 Conscious but not highly aware
 Became aware on my recent visit
 Still not aware (IF "Still not aware", go to Question 12.)
 All other answers proceed to Question 11.

11. What in your opinion is the primary cause of coral bleaching?
 (Check one only)

- Local factors exclusively
 Non-local factors such as
 global warming/climate change, exclusively
 Non-local factors aggravated by local factors
 Local factors aggravated by non-local factors
 I don't know

12. How important do you consider climate change to be for the world of the 21st century? Circle the number that corresponds to your answer.

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

13. And how important do you consider climate change to be for the future of the coral reefs in the Florida Keys?

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

The final part of this mail survey explores a number of alternative management actions that might be applied to protect the Florida Keys. There is general agreement among scientists that the impact of these actions will be to reduce coral bleaching, but not to eliminate it.

- Coral reefs are affected by global and local forces.
- Global climate change and resulting rises in seawater temperatures are considered a major factor in coral bleaching.
- When corals bleach, the corals die and live coral cover is reduced.
- Scientists have found that more coral cover and complexity of corals is associated with more abundant and larger fish, and many different kinds of fish and sea life.
- Emissions of greenhouse gases are considered the main source of global climate change and coral bleaching.
- Water pollution can stress corals and make them more susceptible to disease or reduce their ability to recover from stressful events such as storms or bleaching events.
- Excess nutrients can lead to algal growth, which smothers the corals and kills them.

We present three global alternatives for coral health measured by the amount of live coral cover, before considering local management policies that could be applied to lessen the impact of each global scenario. In the absence of local management policies, living **coral cover** of comparable quality to what exists today is reduced by (a) a massive 95% in 20 years (by 2027) in the worst case scenario, (b) by 80% (intermediate case) or (c) by 50% (best case). Case (a) assumes that there is no further change in global strategies to reduce global warming, and that the average global temperature will increase by 6-8°C by the year 2100. In the intermediate case (b), the increase over the 21st century will be 4°C, and (c) using the most efficient policies nationally and internationally, there will be a 2°C increase in the average global temperature.

- Local forces also affect the health of coral reefs.
- Users can touch, step on, or drop their anchors on the corals.
- Fishermen can overfish a reef and remove fish species that eat algae that can smother and kill the corals.

Local Management Strategies

There are four local strategies included in the FKNMS management plan designed to protect the health of the coral reefs. For each strategy, we present three levels of protection. The no change from current policy is always the low cost strategy.

1. **Education and outreach** are important activities in the FKNMS. The goal is to promote protection and sustainable use of Sanctuary reserves, and public understanding of the nature of marine sanctuaries. Activities include school programs, local community meetings, signage and exhibits in visitor centers, brochures, and TV and radio announcements. Team Ocean, a group of local volunteers, is provided with a FKNMS boat and fuel. They patrol the FKNMS and when they observe someone violating FKNMS rules and regulations, they educate them about how their activity harms the corals. Team Ocean and education and outreach staff also visit local businesses and distribute information on how users can better interact with corals to avoid damages. Education is also an integral element of other programs in the management plan and is considered a low-cost alternative to enforcement.

2. **Enforcement** includes a wide range of measures such as introducing no-anchor zones for vessels above a certain length, reinforcement of bans on spear fishing and touching corals, educating scuba divers and snorkelers about the reefs and enforcing reef protection, and restricting the use of personal vessels on or near the reef. It also involves the mooring buoy program set up around the restricted areas within the Sanctuary.

3. **Water quality** is a crucial issue as reflected by the FKNMS management plan: “Declining water quality continues to be a major concern for the Sanctuary.” Remedies include the development and implementation of wastewater and stormwater plans, efficient options to reduce loading of sediment, toxics and nutrients which damage water quality and the reef, targeting hot spots of industrial and commercial facilities, and reducing pollution from vessels and marinas. Improving water quality is a significantly higher-cost activity than the other items in this list.

4. **Zoning:** There are currently 24 no-take zones in the FKNMS. They cover less than five percent of FKNMS waters, but protect about 60% of the corals. Scientific monitoring of these zones has determined that coral health, fish abundance, size and diversity of fish and sea life have improved in protected areas versus non protected areas. The three levels of protection are (a) no change; or (b) 25% increase in coral cover protected, from 60% to 75%; or (c) 50% increase in coral cover protected, from 60% to 90%.

Reflecting current FKNMS management principles of running several parallel strategies, we have reduced these four policy options to two by combining education and outreach, enforcement, and water quality management into one group, with the options of (a) no change, (b) 5% increase in annual spending, and (c) 10% increase in annual spending. Zoning remains a separate strategy, with three possible levels of protection as shown above.

- A combination of global and local management strategies is required to save the health of the coral reefs.
- Scientists believe that global policies to minimize the increase in greenhouse gases are required to lower sea water temperatures from what they would otherwise have been, and so reduce coral bleaching.
- The more efficient the global strategy to reduce greenhouse gases, the more cost-efficient will be local management actions to protect the reef.
- If local forces are not addressed, the corals will not recover from coral bleaching when or if cooler waters return.
- Policies to reduce the increase in greenhouse gases will result in increased costs to your household through higher utility bills and the costs of products or services.
- Local management strategies will result in increased costs to your household if you are a resident or visitor to the Florida Keys. Costs will be passed on in terms of higher State and local taxes, local water/sewage bills and the costs of local goods and services purchased in the Florida Keys
- We have worked with scientists and managers to estimate the approximate annual costs to your household for the different mixes of global and local management strategies which scientists think will deliver some protection to the corals. The costs to your household are stated in dollars per year.

Questions 14-19 contain six multiple-choice situations to which you are asked to state your preferences and provide a brief explanation for your choices. Each choice presents different mixes of global and local management strategies and has an estimated cost to your household. Each choice always includes the option of choosing the status quo or NO CHANGE (Alt A). This alternative will cost your household \$0, but will result in 95% reduction in the amount of live coral cover in 20 years, and local actions such as improving water quality and increasing the no-take areas will become much less efficient.

Each choice will be similar to the following example. Alt A is always the no-change situation as just explained. Alt B assumes an intermediate global policy for greenhouse gas reduction, and Alt C is based on a stronger and costlier global policy. In each Alt B and C case, different combinations of local management strategies have been designed which yield different coral cover outcomes at different costs to your household, giving you three choices.

We can't help you state your preferences, which depend on your own experience and attitudes. We don't know the extent of your concern about future climate change, how much value you put on the quality of the coral reefs relative to other attractions of the Florida Keys, and the main activities that attracted you there including fishing, boating, snorkeling, and land-based activities. So the example below is purely illustrative, and has nothing whatever to do with what you actually think. It's just an example to assist you in answering questions 14-19.

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	75%	44%
Total annual cost to your household for global and local strategies	\$0	\$201	\$240
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please explain briefly why you made this choice (for example): “I like to fish, and clear water is important. But I would prefer to have more open area to fish on the reefs.”

Please note the following general assumptions when you make your choices:

- The most efficient local management strategy is centered on improving water quality, supplemented by efficient education and enforcement policies. This strategy is also the most expensive local strategy.
- Protecting the reef by increasing the area of no-take zones is also efficient but less so. This relatively low-cost option will reduce reef-fishing activities (but fishing opportunities may be unaffected or may even increase elsewhere in the FKNMS).
- The less efficient the global greenhouse gas strategy to control the rise in sea temperatures, the less efficient the local management strategies will also be.
- Making a choice to spend money on protecting the amount of living coral on the reefs will mean that you have less money to spend on other goods and services.

14. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 75%
Coral cover loss by 2027, Florida Keys	95%	79%	40%
Total annual cost to your household for global and local strategies	\$0	\$81	\$291
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

15. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	78%	40%
Total annual cost to your household for global and local strategies	\$0	\$135	\$345
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

16. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 75%
Coral cover loss by 2027, Florida Keys	95%	75%	46%
Total annual cost to your household for global and local strategies	\$0	\$201	\$231
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

17. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	No change	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	78%	50%
Total annual cost to your household for global and local strategies	\$0	\$90	\$225
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

18. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 50%
Coral cover loss by 2027, Florida Keys	95%	75%	34%
Total annual cost to your household for global and local strategies	\$0	\$201	\$360
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

19. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	77%	44%
Total annual cost to your household for global and local strategies	\$0	\$141	\$240
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

In the survey we conducted with you on-site on your recent visit to the Florida Keys, you told us how many days you spent in the Florida Keys over the past 12 months. In the next set of questions, we would like you to tell us how many days less you would have visited the Florida Keys if coral cover conditions had been worse than they currently are.

Currently, 6% of the entire water area in the FKNMS is covered with living coral.

20. If the living coral cover were only 3% (half the current coral cover), how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

[This page intentionally left blank. Proceed to next page.]

21. If there was no coral cover left or 0% coral cover, how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

Thank you very much for your cooperation in this important survey.

That's All!! If you would like to be entered into a sweepstakes to win a free Vacation to the Florida Keys, fill out your name, address and phone number below. All prizes will be awarded in October of 2007.

Name: _____

Address: _____

City: _____

State: _____ Zip: _____ Phone: _____

Prizes to be awarded are:

GRAND PRIZE

- * Airfare for two from anywhere in the continental United States to the Florida Keys
- * Rental car with unlimited miles for one week (seven days)
- * Accommodations for two for one week (six nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

FIRST PRIZE

- * Accommodations for two for five days (four nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for four days (three nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for three days (two nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)

This is a cooperative research project of the Monroe County Tourist Development Council and the National Oceanic and Atmospheric Administration. Public reporting burden for this collection of information is estimated to average 20 minutes including time for reviewing instructions, searching existing data sources, gathering and maintaining the data need, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to U.S. Department of Commerce, Clearance Officer, Office of Chief Information Officer, Rm. 6625, 14th and Constitution Avenue NW, Washington, DC 20230.

THANK YOU!

for
participating in this
Recreation Survey

Dear Visitor,

During your recent trip to the Florida Keys you indicated that you would be willing to complete this questionnaire. It is self-explanatory and should not take long to complete. **Please** record your answers accurately and legibly. Your answers represent many other people not included in this survey effort so it is **very important** that you return your questionnaire.

Your answers are voluntary and confidential. Your name will never be released to anyone unless otherwise required by law. After the completion of the project all materials identifying you as an individual will be destroyed.

When you complete the questionnaire, please reverse-fold it so that our return address on the GREEN PAGE in the inside is folded to the outside. Please staple or tape to seal the questionnaire and mail it back to us. No postage is needed. Your cooperation in this effort is greatly appreciated.

Sincerely,

Please note: It is very important that the same person who participated in the on-site interview also complete this questionnaire.

Coral reefs are sensitive ecosystems. The Florida Keys, the world's third-largest barrier reef and the only coral reef system along the US mainland coast, is no exception. It has long been recognized that human use of coral reefs and adjacent coastal activities inflict strains on these systems. Non-local factors associated with global human use of the planet's resources add to the strain through their impact on air and sea temperatures.

The Florida Keys National Marine Sanctuary (FKNMS) was founded through a Federal Act to manage issues such as the above. It is managed cooperatively by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida, with significant input from local government, businesses, non-government organizations and the general public. Your views are valuable in the formulation of FKNMS action plans and management strategies.

This mail survey explores your knowledge, attitudes and perceptions of the natural reefs of the Florida Keys. There are no right or wrong answers; we simply want your honest opinion. Again, your privacy will be protected. No one will be given information that will allow them to identify you from survey data.

[This page intentionally left blank. Proceed to next page.]

I. Please read each statement and rate the *importance* of each item during your recent visit in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

IMPORTANCE
(with each of these items during
your recent visit)

				Not Applicable	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5	

2. In the previous question you rated the importance of a list of items during your recent visit. Now please read each of the items on this list and rate how *satisfied* you were with each during your recent visit. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

				Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A)	Clear water (high visibility) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
B)	Amount of living coral on reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
C)	Many different kinds of fish and sea life to view . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
D)	Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles) . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
E)	Large numbers of fish . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
F)	Specially protected areas . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
G)	Mooring buoys near coral reefs . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
H)	Maps, brochures and other tourist information . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
I)	Customer service and friendliness of people . . . . .	. . . . .	n/a	dk	1	2	3	4	5	
J)	Value for the price . . . . .	. . . . .	n/a	dk	1	2	3	4	5	

In this section we have a few special issues questions we would like to ask you.

3. Was your recent visit your first visit to the Florida Keys?

_____ Yes (go to Question 6) _____ No (go to Question 4)

4. When was your previous most recent visit to the Florida Keys?

- 20+ years ago
- 10-19 years ago
- 5-9 years ago
- More recently

SATISFACTION
(with each of these items during
your recent visit in the Florida Keys)

5. Please cast your mind back to your previous most recent visit and rate *how satisfied you were then* with the same items in the Florida Keys area. If an item does not apply, indicate by circling n/a (not applicable). Likewise, if you don't know, circle (dk).

		Not Applicable	Don't Know	Terrible	Unhappy/Dissatisfied	Mixed	Happy/Satisfied	Delighted
A) Clear water (high visibility)	n/a	dk	1	2	3	4	5	
B) Amount of living coral on reefs	n/a	dk	1	2	3	4	5	
C) Many different kinds of fish and sea life to view	n/a	dk	1	2	3	4	5	
D) Opportunity to view large wildlife: (manatees, whales, dolphins, sea turtles)	n/a	dk	1	2	3	4	5	
E) Large numbers of fish	n/a	dk	1	2	3	4	5	
F) Specially protected areas	n/a	dk	1	2	3	4	5	
G) Mooring buoys near coral reefs	n/a	dk	1	2	3	4	5	
H) Maps, brochures and other tourist information	n/a	dk	1	2	3	4	5	
I) Customer service and friendliness of people	n/a	dk	1	2	3	4	5	
J) Value for the price	n/a	dk	1	2	3	4	5	

6. What do you think are the greatest threats to the reefs in the Florida Keys in the following list? Please rank greatest threat=1, second-greatest threat=2, third-greatest threat=3, and so on for as many factors as you consider **important threats**. **Leave blank those you consider unimportant.**

- Spear fishers
- Scuba divers
- Urban development
- Ships and boats grounding on reefs, discharging pollutants
- Hurricanes
- Solid waste disposal (sewage)
- Climate change (global warming etc)
- Stormwater and wastewater runoff
- Overfishing by commercial and recreational fishers
- Number of tourists
- Chemical runoff (pesticides, herbicides, fertilizers)
- People collecting coral and live rock

7. Any other important factors we have omitted from the list?

If any, write in _____

8. What in your opinion should the Marine Sanctuary (FKNMS) do to reduce the main stress factors on the reef? Please rank your first recommendation=1, second=2, and so on for all recommendations you consider important. **Leave those blank that you consider unimportant.**

- Stringent control of pollutants to preserve water quality.....
- Enforced training/certification of scuba divers and snorkelers
- Prohibiting spear fishing.....
- Stronger shipping regulations.....
- Training, workshops and school programs.....
- Better management of waterways.....
- More no-catch fishing zones in the FKNMS.....

9. Do you have any other important recommendations on how FKNMS could reduce the main stress factors on the reef?

If any, write in _____

• The main signs of coral stress are coral diseases and **coral bleaching**.

• The coral organism lives in a mutually dependent (symbiotic) relationship with tiny algae known as *zooxanthellae*. Their health is highly dependent on temperature and the coral expels them when the sea temperature gets above a certain level. This causes the coral to turn white and weaken, the phenomenon known as coral bleaching.

• There is general agreement among scientists that the world's climate is getting warmer and that this may cause large sections of the world's coral reefs to die.

• There is also a general consensus that control of other stress factors can make the coral organisms more resilient (able to resist and/or recover from stressful events).

10. Were you aware of coral bleaching before your recent visit, and if so to what extent?

- Highly aware
 Conscious but not highly aware
 Became aware on my recent visit
 Still not aware (IF "Still not aware", go to Question 12.)

All other answers proceed to Question 11.

11. What in your opinion is the primary cause of coral bleaching?
(Check one only)

- Local factors exclusively
 Non-local factors such as
 global warming/climate change, exclusively
 Non-local factors aggravated by local factors
 Local factors aggravated by non-local factors
 I don't know

12. How important do you consider climate change to be for the world of the 21st century? Circle the number that corresponds to your answer.

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

13. And how important do you consider climate change to be for the future of the coral reefs in the Florida Keys?

	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
dk	1	2	3	4	5	

The final part of this mail survey explores a number of alternative management actions that might be applied to protect the Florida Keys. There is general agreement among scientists that the impact of these actions will be to reduce coral bleaching, but not to eliminate it.

- Coral reefs are affected by global and local forces.
- Global climate change and resulting rises in seawater temperatures are considered a major factor in coral bleaching.
- When corals bleach, the corals die and live coral cover is reduced.
- Scientists have found that more coral cover and complexity of corals is associated with more abundant and larger fish, and many different kinds of fish and sea life.
- Emissions of greenhouse gases are considered the main source of global climate change and coral bleaching.
- Water pollution can stress corals and make them more susceptible to disease or reduce their ability to recover from stressful events such as storms or bleaching events.
- Excess nutrients can lead to algal growth, which smothers the corals and kills them.

We present three global alternatives for coral health measured by the amount of live coral cover, before considering local management policies that could be applied to lessen the impact of each global scenario. In the absence of local management policies, living **coral cover** of comparable quality to what exists today is reduced by (a) a massive 95% in 20 years (by 2027) in the worst case scenario, (b) by 80% (intermediate case) or (c) by 50% (best case). Case (a) assumes that there is no further change in global strategies to reduce global warming, and that the average global temperature will increase by 6-8°C by the year 2100. In the intermediate case (b), the increase over the 21st century will be 4°C, and (c) using the most efficient policies nationally and internationally, there will be a 2°C increase in the average global temperature.

- Local forces also affect the health of coral reefs.
- Users can touch, step on, or drop their anchors on the corals.
- Fishermen can overfish a reef and remove fish species that eat algae that can smother and kill the corals.

Local Management Strategies

There are four local strategies included in the FKNMS management plan designed to protect the health of the coral reefs. For each strategy, we present three levels of protection. The no change from current policy is always the low cost strategy.

1. **Education and outreach** are important activities in the FKNMS. The goal is to promote protection and sustainable use of Sanctuary reserves, and public understanding of the nature of marine sanctuaries. Activities include school programs, local community meetings, signage and exhibits in visitor centers, brochures, and TV and radio announcements. Team Ocean, a group of local volunteers, is provided with a FKNMS boat and fuel. They patrol the FKNMS and when they observe someone violating FKNMS rules and regulations, they educate them about how their activity harms the corals. Team Ocean and education and outreach staff also visit local businesses and distribute information on how users can better interact with corals to avoid damages. Education is also an integral element of other programs in the management plan and is considered a low-cost alternative to enforcement.

2. **Enforcement** includes a wide range of measures such as introducing no-anchor zones for vessels above a certain length, reinforcement of bans on spear fishing and touching corals, educating scuba divers and snorkelers about the reefs and enforcing reef protection, and restricting the use of personal vessels on or near the reef. It also involves the mooring buoy program set up around the restricted areas within the Sanctuary.

3. **Water quality** is a crucial issue as reflected by the FKNMS management plan: “Declining water quality continues to be a major concern for the Sanctuary.” Remedies include the development and implementation of wastewater and stormwater plans, efficient options to reduce loading of sediment, toxics and nutrients which damage water quality and the reef, targeting hot spots of industrial and commercial facilities, and reducing pollution from vessels and marinas. Improving water quality is a significantly higher-cost activity than the other items in this list.

4. **Zoning:** There are currently 24 no-take zones in the FKNMS. They cover less than five percent of FKNMS waters, but protect about 60% of the corals. Scientific monitoring of these zones has determined that coral health, fish abundance, size and diversity of fish and sea life have improved in protected areas versus non protected areas. The three levels of protection are (a) no change; or (b) 25% increase in coral cover protected, from 60% to 75%; or (c) 50% increase in coral cover protected, from 60% to 90%.

Reflecting current FKNMS management principles of running several parallel strategies, we have reduced these four policy options to two by combining education and outreach, enforcement, and water quality management into one group, with the options of (a) no change, (b) 5% increase in annual spending, and (c) 10% increase in annual spending. Zoning remains a separate strategy, with three possible levels of protection as shown above.

- A combination of global and local management strategies is required to save the health of the coral reefs.
- Scientists believe that global policies to minimize the increase in greenhouse gases are required to lower sea water temperatures from what they would otherwise have been, and so reduce coral bleaching.
- The more efficient the global strategy to reduce greenhouse gases, the more cost-efficient will be local management actions to protect the reef.
- If local forces are not addressed, the corals will not recover from coral bleaching when or if cooler waters return.
- Policies to reduce the increase in greenhouse gases will result in increased costs to your household through higher utility bills and the costs of products or services.
- Local management strategies will result in increased costs to your household if you are a resident or visitor to the Florida Keys. Costs will be passed on in terms of higher State and local taxes, local water/sewage bills and the costs of local goods and services purchased in the Florida Keys
- We have worked with scientists and managers to estimate the approximate annual costs to your household for the different mixes of global and local management strategies which scientists think will deliver some protection to the corals. The costs to your household are stated in dollars per year.

Questions 14-19 contain six multiple-choice situations to which you are asked to state your preferences and provide a brief explanation for your choices. Each choice presents different mixes of global and local management strategies and has an estimated cost to your household. Each choice always includes the option of choosing the status quo or NO CHANGE (Alt A). This alternative will cost your household \$0, but will result in 95% reduction in the amount of live coral cover in 20 years, and local actions such as improving water quality and increasing the no-take areas will become much less efficient.

Each choice will be similar to the following example. Alt A is always the no-change situation as just explained. Alt B assumes an intermediate global policy for greenhouse gas reduction, and Alt C is based on a stronger and costlier global policy. In each Alt B and C case, different combinations of local management strategies have been designed which yield different coral cover outcomes at different costs to your household, giving you three choices.

We can't help you state your preferences, which depend on your own experience and attitudes. We don't know the extent of your concern about future climate change, how much value you put on the quality of the coral reefs relative to other attractions of the Florida Keys, and the main activities that attracted you there including fishing, boating, snorkeling, and land-based activities. So the example below is purely illustrative, and has nothing whatever to do with what you actually think. It's just an example to assist you in answering questions 14-19.

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 75%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	75%	44%
Total annual cost to your household for global and local strategies	\$0	\$268	\$320
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please explain briefly why you made this choice (for example): “I like to fish, and clear water is important. But I would prefer to have more open area to fish on the reefs.”

Please note the following general assumptions when you make your choices:

- The most efficient local management strategy is centered on improving water quality, supplemented by efficient education and enforcement policies. This strategy is also the most expensive local strategy.
- Protecting the reef by increasing the area of no-take zones is also efficient but less so. This relatively low-cost option will reduce reef-fishing activities (but fishing opportunities may be unaffected or may even increase elsewhere in the FKNMS).
- The less efficient the global greenhouse gas strategy to control the rise in sea temperatures, the less efficient the local management strategies will also be.
- Making a choice to spend money on protecting the amount of living coral on the reefs will mean that you have less money to spend on other goods and services.

14. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	78%	38%
Total annual cost to your household for global and local strategies	\$0	\$108	\$400
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

15. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	76%	44%
Total annual cost to your household for global and local strategies	\$0	\$200	\$320
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

16. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	+5%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	From 60% to 75%
Coral cover loss by 2027, Florida Keys	95%	78%	40%
Total annual cost to your household for global and local strategies	\$0	\$108	\$388
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

17. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	+10%
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	From 60% to 75%
Coral cover loss by 2027, Florida Keys	95%	76%	36%
Total annual cost to your household for global and local strategies	\$0	\$260	\$468
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

18. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+10%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	From 60% to 90%	From 60% to 90%
Coral cover loss by 2027, Florida Keys	95%	74%	44%
Total annual cost to your household for global and local strategies	\$0	\$280	\$320
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

19. Suppose you could only choose between the following three alternative combinations of global and local strategies, which would be your most preferred alternative and which would be your least preferred alternative?

	Alt A	Alt B	Alt C
Global policy for reductions in greenhouse gases (compared with no change in policy as in Alt A.)	No change	Medium reductions	Large reductions
Local Florida Keys Management Strategies			
Added spending on water quality, education and outreach, and enforcement	No change	+5%	No change
Increase in no-take zoning of coral reef areas (percent of coral reefs protected)	No change (60%)	No change (60%)	No change (60%)
Coral cover loss by 2027, Florida Keys	95%	78%	50%
Total annual cost to your household for global and local strategies	\$0	\$108	\$300
Your most preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your least preferred alternative (check one)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain briefly why you made this choice (for example): _____

In the survey we conducted with you on-site on your recent visit to the Florida Keys, you told us how many days you spent in the Florida Keys over the past 12 months. In the next set of questions, we would like you to tell us how many days less you would have visited the Florida Keys if coral cover conditions had been worse than they currently are.

Currently, 6% of the entire water area in the FKNMS is covered with living coral.

20. If the living coral cover were only 3% (half the current coral cover), how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

[This page intentionally left blank. Proceed to next page.]

21. If there was no coral cover left or 0% coral cover, how many days less would you have spent in the Florida Keys over the past 12 months?

- No change
_____ (# of days less)
- I wouldn't have visited at all
- I don't know

Thank you very much for your cooperation in this important survey.

That's All!! If you would like to be entered into a sweepstakes to win a free Vacation to the Florida Keys, fill out your name, address and phone number below. All prizes will be awarded in October of 2007.

Name: _____

Address: _____

City: _____

State: _____ Zip: _____ Phone: _____

Prizes to be awarded are:

GRAND PRIZE

- * Airfare for two from anywhere in the continental United States to the Florida Keys
- * Rental car with unlimited miles for one week (seven days)
- * Accommodations for two for one week (six nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

FIRST PRIZE

- * Accommodations for two for five days (four nights)
- * Two complimentary "activities" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for four days (three nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)
- * Complimentary dinner for two at local restaurant

SECOND PRIZE

- * Accommodations for two for three days (two nights)
- * One complimentary "activity" for two (i.e., diving trip, fishing charter, sunset sail, etc.)

This is a cooperative research project of the Monroe County Tourist Development Council and the National Oceanic and Atmospheric Administration. Public reporting burden for this collection of information is estimated to average 20 minutes including time for reviewing instructions, searching existing data sources, gathering and maintaining the data need, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to U.S. Department of Commerce, Clearance Officer, Office of Chief Information Officer, Rm. 6625, 14th and Constitution Avenue NW, Washington, DC 20230. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subject to penalty for failure to comply with, a collection of information subject to requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.