

# Fishery Issues and Potential Future Conditions of Fishery Resources and Fishing Experience in Biscayne National Park

## DRAFT DOCUMENT-CATEGORIES AND FUTURE CONDITIONS ONLY

**Introduction:** In this section, we present a range of potential future conditions for fishery resources and fishing experience in Biscayne National Park (BISC). Each number below represents one of fourteen Fisheries Issues Sub Categories (FI) relating to (1) populations of exploited fish and shellfish, (2) commercial fishing activity, (3) habitat condition, or (4) recreational fishing experience. For each FI, there are options listed describing various potential desired future conditions of the FI. Options are listed in increasing order of degree of change (A → D) from current levels of the Fishery Issue, and thus from current management policies.

The terms “decline” and “increase” are defined as a statistically significant<sup>1</sup> decrease or increase, respectively, in the variable of interest, as identified using the best available and most reasonable analytical approaches. *Current* (baseline) *levels* are defined as levels measured (quantitatively) during 2000-2004 by federal, state, academic and independent researchers. If data are not available for 2000-2004, current levels are defined as the first year(s) for which data can be collected.

## ISSUE CATEGORIES

### 1. POPULATIONS OF EXPLOITED FISH & SHELLFISH

#### SUB CATEGORY 1.1

***The abundance and average size of fish (that are subject to take and spend a significant portion of their lives within the Park) relative to those fish in similar fished habitats outside the Park***

**Background:** Both the Park and the FWC feel that the abundance and average size of fish caught within the Park compared to those caught in areas outside the Park may be an important issue to consider with regard to the Park fishery. Sampling data has shown that abundances and size of many species do not differ between the Park and similar fished habitats outside the Park, and that for many fished species current

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<sup>1</sup> Where alpha = 0.05, meaning there is a 95% probability that observed differences are true differences, and a 5% probability that differences are not true, but arose from chance due to sampling of variability in the measured populations.

populations both within and out of the Park are significantly fewer in number and smaller than they have been historically. In some cases, Park resources appear to be in worse condition than in surrounding areas. For example, a reef fish visual census performed in 2002 indicated that mean sizes of some groupers and snappers are smaller in the Park, relative to similar areas outside the Park.

**Caveats:** It is recognized that the stated “desired conditions” under this issue may not apply to all species equally. Some species do not reside within the Park for long periods of time and therefore would not be influenced by Park management regulations alone. In some cases, a successful increase in one species may result in a corresponding decrease in an associated species. Observed changes in population abundance and average fish size will be evaluated against all factors potentially influencing the population before fishery management actions are taken to achieve stated desired conditions.

**Potential desired future conditions:**

*A:* No change in current management.

*B:* Abundance and average size of fish in the Park are maintained at or above levels in similar fished habitats outside the Park (in southeast Florida). New, Park-specific management actions would be enacted only if the current abundance and size of fish were to decline relative to similar habitats outside the Park.

*C:* Abundance and average size are increased to and maintained at least 10% above those in similar fished habitats outside the Park (in southeast Florida). New Park-specific management actions would be required to insure that Park stocks achieve and remain at or above target conditions.

*D:* Abundance and average size are increased to and maintained at least 20% above those in similar fished habitats outside the Park (in southeast Florida). New Park-specific management actions would be taken as necessary to insure that Park stocks achieve and remain at or above target conditions.

*E:* Other suggestions:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 1.2**

***Future abundance and average size of fish within the Park (that are subject to take and spend a significant portion of their lives within the Park) relative to current levels***

**Background:** The fishery resources in the Park support diverse recreational and commercial fisheries. Available data suggests that numerous fish stocks in the Park are heavily exploited and/or overfished, and have declined from historical levels. Relative to historical levels, there are few large fish. Six species of fish that occur in Park waters (goliath grouper, Nassau grouper, gag grouper, black grouper, vermillion snapper, and yellowtail snapper) are listed as overfished in South Atlantic waters by the South Atlantic Fishery Management Council (2001). A reef fish visual census performed in 2002 indicated that mean sizes of some groupers and snappers are smaller in the Park relative to areas outside the Park that experienced lower fishing pressure. Therefore, the Park and the FWC feel it may be appropriate to develop a statement concerning the “desired future condition” of fish abundance and size within the Park relative to the current conditions.

**Potential desired future conditions:**

- A: No change in current management.
- B: Abundance and size are maintained at or above current levels. New, Park-specific management actions would be enacted only if the current abundance and size of fish were to decline.
- C: Abundance and size are increased to and maintained at least 10% above current levels. Park-specific management actions would be taken as necessary to insure that Park stocks are increased to and maintained at target conditions.
- D: Abundance and size are increased to and maintained at least 20% above current levels. Park-specific management actions would be taken as necessary to insure that Park stocks are increased to and maintained at target conditions.
- E: Other suggestions:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 1.3**

***The long-term abundances of spiny lobster, blue crab, stone crab and pink shrimp within the Park***

**Background:** These organisms support commercial and recreational fisheries. Based on fishery-dependent and –independent data, it is likely that populations of these species have remained relatively stable over the last several decades. However, as with the finfish species, statements of “desired future conditions” with regards to population abundances would be appropriate for guiding future management decisions.

**Potential desired future conditions:**

- A: No change in current management.
- B: Populations are maintained at or above current levels. New, Park-specific management actions would be enacted only if levels were to decline.
- C: Populations within the Park are increased by 10% over current abundance. Park-specific management actions would be taken as necessary to ensure that Park stocks are increased to and maintained at the target conditions.
- D: Populations within the Park are increased by 20% over current abundance. Park-specific management actions would be taken as necessary to ensure that Park stocks are increased to and maintained at the target conditions.
- E: Other suggestions:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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## 2. COMMERCIAL FISHING ACTIVITY

### SUB CATEGORY 2.1

#### *Numbers of commercial fishers within the Park*

**Background:** In Miami-Dade County, the commercial fleet harvest over the last decade has been relatively constant (between 1-2 million pounds of finfish and invertebrates annually). The number of registered commercial vessels increased from 1,242 vessels in 1964 to 3,135 vessels in 1999, but then decreased to 1,695 in 2001. In 1965, when Congress was considering allowing fishing to continue in the Park, total reported landings of commercial food species in Biscayne Bay totaled 605,500 pounds. In 2001, commercial landings for Miami-Dade County totaled 1,601,221 pounds (food species and bait shrimp).

#### **Potential desired future conditions:**

- A: No change in current management.
- B: The current number of commercial fishers would not be allowed to increase from current levels.
- C: The current number of commercial fishers would be permitted initially but reduced by 20% through attrition of retiring permit holders over time.
- D: The current number of commercial fishers would be permitted initially but reduced by 30% through attrition of retiring permit holders over time.
- E: Other suggestions:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 2.2**

***Bycatch amount and bycatch-related mortality associated with commercial fishing gear***

**Background:** All commercial fisheries in the Park generate bycatch and some bycatch-related mortality. Current data are insufficient to quantify bycatch mortality by fishery but both the Park and the FWC feel that the level of bycatch occurring is an important concern for fisheries management and is suitable for the development of a statement with regards to a “desired future condition.” Levels of bycatch will be assessed in the future through combinations of Biscayne survey data and all other available information (e.g., published manuscripts, technical reports, and ongoing research projects).

**Potential desired future conditions:**

- A: No change in current management.
- B: The current level of bycatch and bycatch-related mortality is allowed but not increased. Additional management actions to reduce bycatch and bycatch-related mortality would be taken only if an increase above current levels was observed.
- C: Bycatch and bycatch-related mortality rates are reduced and maintained at least 20% below current levels. Specific management actions would be taken as necessary to achieve a reduction in bycatch and bycatch-related mortality to the target level.
- D: Bycatch and bycatch-related mortality rates are reduced and maintained at least 30% below current levels. Specific management actions would be taken as necessary to achieve a reduction in bycatch and bycatch-related mortality to the target level.
- E: Other suggestions:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**3. HABITAT CONDITIONS**  
*(Alterations to the physical natural environment by recreational and commercial fishing activities)*

**SUB CATEGORY 3.1**

***Impacts from roller-frame trawling***

**Background:** Bait shrimp trawlers operate within the Park in areas covering up to 350 km<sup>2</sup>. While trawlers focus efforts in seagrass areas, hardbottom areas interspersed with seagrass are also frequently trawled. Studies have shown that, while roller-frame trawling over seagrass has limited impacts, damage is usually severe to hard-bottom communities (which provide important nursery habitat to fish and invertebrates) and organisms subjected to roller-frame trawling.

**Potential desired future conditions:**

- A: No change in current management.
- B: Roller-frame trawling is confined to seagrass beds in the bay portion of the Park. Regulations would be established prohibiting trawling over areas delineated as hardbottom habitat.
- C: Allowable-harvest areas for shrimp trawling will be established. Non-harvest, control areas would be set aside for studies of trawling impacts on physical habitat and aquatic faunal species composition.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 3.2**

***Frequency of derelict spiny lobster and crab traps and trap debris on benthic habitats***

**Background:** Visual surveys throughout the Keys in 2002 found that densities of derelict traps and trap debris were higher in the Park than in most other areas throughout the Keys. Up to 33% of lobster traps are found in patch reef areas. In the future, levels of traps and trap debris will be defined through combinations of Park survey data and other available information (e.g., published manuscripts, technical reports, and ongoing research projects).

**Potential desired future conditions:**

- A: No change in current management.
- B: Densities of derelict spiny lobster and crab traps and of trap debris on benthic habitats are maintained at or below current levels. Additional management actions to reduce the level of derelict trap numbers or amounts of debris on the reefs would be taken only if an increase above current levels is observed.
- C: Densities of derelict spiny lobster and crab traps and of trap debris on benthic habitats are reduced and maintained at least 50% below current levels. Specific management actions would be taken as necessary to achieve the desired reduction in numbers or derelict traps and amounts of trap debris on the reefs.
- D: Densities of derelict spiny lobster and crab traps and of trap debris on benthic habitats are reduced and maintained at least 75% below current levels. Specific management actions would be taken as necessary to achieve the desired reduction in numbers or derelict traps and amounts of trap debris on the reefs.
- E: Other suggestion:

**Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.**

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**SUB CATEGORY 3.3**

***Frequency of lost or discarded hook and line fishing gear***

**Background:** There is insufficient data to quantify current levels of lost or discarded hook and line fishing gear but it is often seen while diving on Park reefs. The presence of this gear is detrimental to many reef organisms and to the recreational diving experience. The Park feels that it may be important to have a statement of “desired future condition” to guide necessary management actions with respect to this issue. In the future, levels of discarded hook and line fishing gear will be defined through combinations of Park survey data and other available information (e.g., published manuscripts, technical reports, and ongoing research projects).

**Potential desired future conditions:**

- A: No change in current management.
- B: Densities of lost or discarded hook and line fishing gear on benthic habitats are maintained at or below current levels. Additional management actions to reduce the level of fishing gear debris on the reefs would be taken only if an increase above current levels is observed.
- C: Densities of lost or discarded hook and line fishing gear on benthic habitats are reduced and maintained at least 50% below current levels. Specific management actions would be taken as necessary to achieve the desired reduction in the amounts of fishing gear debris on the reefs.
- D: Densities of lost or discarded hook and line fishing gear on benthic habitats are reduced and maintained at least 75% below current levels. Specific management actions would be taken as necessary to achieve the desired reduction in the amounts of fishing gear debris on the reefs.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 3.4**

***Habitat impacts (e.g., broken, injured and over-turned coral) due to lobster divers***

**Background:** The Park has noticed considerable new damage to coral reefs and other habitats within the Park following the annual two-day lobster sport-season, which strongly suggests impacts resulting from lobster divers. There is the potential for considerable habitat impacts from lobster divers. There is insufficient data to quantify current levels of habitat impact but, in the future, habitat impacts will be assessed through combinations of Park survey data and other available information (e.g., published manuscripts, technical reports, and ongoing research projects). A statement of “desired future condition” with regards to lobster diver impacts may be helpful in determining when additional management actions are necessary.

**Potential desired future conditions:**

- A: No change in current management.
- B: Habitat impacts are maintained at or below current levels. Additional management actions to reduce the level of impacts would be taken only if an increase above current levels is observed.
- C: Habitat impacts are reduced and maintained at least 50% below current levels. Specific management actions would be taken as necessary to achieve the desired reduction in the amount of impact.
- D: Habitat impacts are reduced and maintained at least 75% below current levels. Specific management actions would be taken as necessary to achieve the desired reduction in the amount of impact.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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### SUB CATEGORY 3.5

#### *Spearfishing impacts*

**Background:** Due to concerns associated with (1) spearfisher-associated reef damage, (2) potential behavioral effects on fishes that are targeted by spearfishers, and (3) the harvest of fish smaller than minimum regulatory size due to “underwater magnification”, the Park is concerned about the effects of spearfishing on Park resources. In light of these concerns, spearfishing has been restricted in other nearby marine areas (Everglades National Park and parks under the jurisdiction of the Florida Division of Recreation and Parks, including John Pennekamp Coral Reef State Park, which is adjacent to Biscayne National Park). A statement of “desired future condition” with regards to spearfishing may be helpful in determining whether management actions are necessary. There is insufficient data to quantify current levels of spearfishing impacts on habitat and fish populations in the Park.

**Potential desired future conditions:**

- A: No change in current management.
- B: Spearfishing impacts are maintained at or below current levels. Management actions would only be undertaken if increases in items 1 through 3 listed above (background section) were identified.
- C: Spearfishing impacts are reduced below current levels. Management actions would be taken to reduce the effects of spearfishing on items 1 through 3 listed above.
- D: Spearfishing impacts are eliminated. Management actions would be taken to eliminate the effects of spearfishing on 1 through 3 listed above.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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## 4 RECREATIONAL FISHING EXPERIENCE

### SUB CATEGORY 4.1

#### *Quality of experience of Park visitors engaged in recreational fishing*

**Background:** Visitor experience (of which recreational fishing experience is a part) is a fundamental component of the National Park Service mission. Park data show that ~93% of all Park visitors are satisfied with their overall Park experience and the Park would like to maintain or improve upon this figure for recreational fishers. A stated “desired condition” with regards to fisher satisfaction would be used to help guide management response to this important issue. There is currently insufficient data to quantify the quality of experience of just recreational fishers in the Park. The Park has initiated steps to collect this data.

#### **Potential desired future conditions:**

- A: No change in current management.
- B: At least 85% of recreational anglers, annually, report having a “satisfying” experience. Failure to meet this level will result in further management investigations and possible actions to improve recreational fishing experience.
- C: At least 90% of recreational anglers, annually, report having a “satisfying” experience. Failure to meet this level will result in further management investigations and possible actions to improve recreational fishing experience.
- D: At least 95% of recreational anglers, annually, report having a “satisfying” experience. Failure to meet this level will result in further management investigations and possible actions to improve recreational fishing experience.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 4.2**

***The portion of flats fishers experiencing a “private and tranquil” experience***

**Background:** Long before Biscayne National Park was established, Biscayne Bay had a world renowned reputation for its flats fishing. This reputation has continued but is becoming increasingly threatened by increased motor boat use around and over the flats that are fished. Flats fishers report frequent disturbances from combustion engine-propelled vessels operating over shallow-water areas. Use of motorboats on shallow flats disturbs the private and tranquil experience associated with this type of fishing sought by these fishers, and can be harmful to the habitat and fish using these flats. A considerable proportion of recreational fishers that utilize the Park are flats fishers, and flats fishing is an important component of the Park’s recreational opportunities. A “desired future condition” statement with regards to this issue may be desirable to guide future management actions.

**Potential desired future conditions:**

- A: No change in current management.
- B: At least 75% of flats fishers, annually, report being undisturbed by combustion engines while fishing. Failure to achieve the desired target level will result in establishment of non-combustion engine use areas.
- C: At least 85% of flats fishers, annually, report being undisturbed by combustion engines while fishing. Failure to achieve the desired target level will result in establishment non-combustion engine use areas, coupled with increased enforcement.
- D: At least 95% of flats fishers, annually, report being undisturbed by combustion engines while fishing. Failure to achieve the desired target level will result in establishment of non-combustion engine use areas, coupled with increased enforcement.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 4.3**

***Fishing public’s knowledge of fishing regulations in the Park***

**Background:** A high level of public knowledge of fishing regulations is critical to the effective management of fishery resources in the Park. Setting a desired standard through the use of a “desired future condition” statement will help identify when additional efforts to inform the public may be needed. There is insufficient data to quantify current levels of the fishing public’s knowledge of fishing regulations in the Park.

**Potential desired future conditions:**

- A: No change in current management.
- B: At least 75% of the fishing public, annually, is knowledgeable of fishing regulations in the Park. Failure to meet this level will result in further management actions and public education efforts to improve fisher knowledge of regulations.
- C: At least 85% of the fishing public, annually, is knowledgeable of fishing regulations in the Park. Failure to meet this level will result in further management actions and public education efforts to improve fisher knowledge of regulations.
- D: At least 95% of the fishing public, annually, is knowledgeable of fishing regulations in the Park. Failure to meet this level will result in further management actions and public education efforts to improve fisher knowledge of regulations.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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**SUB CATEGORY 4.4**

***Fishing public’s compliance with fishing regulations in the Park***

**Background:** In addition to knowledge of Park fishing regulations, a high level of compliance with regulations is critical to the effective management of fishery resources in the Park. Violations of regulations are commonly observed during surveys of fishers returning to local marinas. Violations may be due to a lack of knowledge of the regulations or to accidental or purposeful violation. A stated “desired future condition” of high compliance will help the Park gage when and what kinds of management actions are needed to insure regulations are observed.

**Note:** The Park is exploring options with cooperating law enforcement agencies to expand enforcement efforts within the Park.

**Potential desired future conditions:**

- A: No change in current management.
- B: At least 75% of anglers, annually, are in compliance with Park fishing regulations. Failure to meet this level will result in further management actions and law enforcement efforts to improve compliance.
- C: At least 85% of anglers, annually, are in compliance with Park fishing regulations. Failure to meet this level will result in further management actions and law enforcement efforts to improve compliance.
- D: At least 95% of anglers, annually, are in compliance with Park fishing regulations. Failure to meet this level will result in further management actions and law enforcement efforts to improve compliance.
- E: Other suggestion:

Indicate your preferred future condition. If you would like some combination, please attempt to draft language that makes you comfortable.

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