

## **SECTION 1** **INTRODUCTION**

A conceptual scope of work (SOW) for the Florida Keys Carrying Capacity Study is described herein. The detailed SOW for use in the contracting process will be prepared prior to initiation of the advertisement and selection process. The Florida Keys Carrying Capacity Study does not assume that the current amount of development or any future amount of development is appropriate or is not appropriate. The carrying capacity analysis will provide the information to be used by local, regional and state planners to determine whether the current amount of development should be reduced, is appropriate or additional development could occur in non-environmentally sensitive areas.

### **Carrying Capacity Concept**

The Keys Carrying Capacity Study concept is about sustainable development. The carrying capacity analysis shall be designed to determine the ability of the Florida Keys ecosystem, and the various segments thereof, to withstand all impacts of additional land development activities. The analysis shall be based upon the findings adopted by the Administration Commission on December 12, 1995, or more recent data that may become available in the course of the study, and shall be based upon the benchmarks of, and all adverse impacts to, the Keys land and water natural systems, in addition to the impact of nutrients on marine resources. The carrying capacity analysis shall consider aesthetic, socioeconomic (including sustainable tourism), quality of life and community character issues, including the concentration of population, the amount of open space, diversity of habitats, and species richness. The analysis shall reflect the interconnected nature of the Florida Keys' natural systems, but may consider and analyze the carrying capacity of specific islands or groups of islands and specific ecosystems or habitats, including distinct parts of the Keys' marine system. (*Florida Administrative Weekly*, April 12, 1996)

This study will provide an information database and an analysis of consequences that may be used to determine the level of land development activities that will avoid further irreversible and/or adverse impacts to the Florida Keys ecosystem. Equally fundamental to this study is the identification of restoration opportunities for the Florida Keys ecosystem. Among the basic premises of the carrying capacity concept is the ability to scientifically determine many thresholds for both societal and natural resources tolerance ranges that are measurable in trends or quantifiers. Other thresholds that are not measurable in trends or quantifiers will be determined by alternative methods to be defined during the course of the study. Sustainable development requires avoidance of natural resource waste and degradation. This concept acknowledges the potential of future technological contributions, scientific discoveries and/or a community's ability to redefine its character over time. However, this acknowledgment is shadowed by the basic premise that biological limits exist, and will ultimately determine the carrying capacity.

### **Study Area**

The Florida Keys Carrying Capacity Study is focused on the portion of Monroe County that spans from Key Largo to the Dry Tortugas. The Florida mainland will be excluded except for the hurricane evacuation route to the Turnpike. The “Florida Keys” formally consists of 113 miles of low-lying islands with a combined area of approximately 100 square miles. They include over 200 additional offshore islands. The study area boundary found below the mean high water mark follows that of the Florida Keys National Marine Sanctuary. U.S. Highway 1 provides a mainland connection that joins a chain of 38 islands arcing southwesterly toward Cuba and the Gulf of Mexico. Mile markers begin with 0 in Key West and end with 113 south of Florida City. Florida Bay and the Gulf of Mexico lie to the north and northwest of the Keys respectively. The Atlantic Ocean lies to the east.

Miami oolite and Key Largo limestone dominate the geology of these islands typified by tropical hardwood hammocks, pine rocklands, transition zones and tidal wetlands. Existing fresh water wetlands and catchments, receiving 35 to 45 inches of annual rainfall, are intrinsically linked to sea fluctuations. The fragile marine environment contains seagrass meadows, mangrove islands and living coral reefs.

Four National Wildlife Refuges overlap land and water in the Keys, along with three State Parks. In addition, four state botanical, geological and historical sites, as well as four State Preserves are found within the study area of Monroe County. The Florida Keys also have a designated National Marine Sanctuary. Over 100 species of flora and fauna within the boundaries of the Florida Keys are identified on Federal and/or State lists as: endangered, threatened, species of special concern, commercially exploited, candidate, or proposed for listing. This ecosystem also includes human habitation.

The Keys have an extensive history of human occupation dating back to the Calusa and Tequesta Indians. A number of prehistoric and historic sites included in the National Register of Historic Places are located in the Keys. Today more than 80,000 permanent residents live on the Florida Keys. Approximately 2.5 million tourists travel annually to the Florida Keys to visit and/or live seasonally.

### **Study Authority**

This study will fulfill the Department of Community Affairs’ need to comply with Administration Commission Rule 28-20.100 which requires that the carrying capacity analysis be designed to determine the ability of the Florida Keys ecosystem, and the various segments thereof, to withstand all impacts of additional land development activities. Executive Order 96-108, Section III.1. coordinates state agency activities necessary to implement the Administration Commission Rule. Section III.1. of Executive Order 96-108 states “DEP [Florida Department of Environmental Protection], DCA [Department of Community Affairs], HRS [Florida Department of Health and Rehabilitative Services], and the Department of Transportation (DOT) shall, and the South Florida Water Management District (SFWMD) is requested to, assist Monroe County in the implementation of the Permit Allocation System contained in the 2010 Plan, and in conducting a carrying capacity analysis. Said agencies shall specifically adhere to

and implement the findings of a carrying capacity analysis as it relates to and affects the rate of growth and permit allocation in Monroe County.”

The U.S. Army Corps of Engineers (USACE) participation in the development of this SOW is authorized under the Support For Others program in accordance with the Intergovernmental Cooperation Act (31 USC 6505) and (10 U.S.C. 3036 Ld.). A Memorandum of Agreement (1996) between the Florida Department of Community Affairs (DCA) and the Jacksonville District, USACE provides the Federal/non-Federal legal agreement for development of this SOW.

Continued Federal participation in the development and completion of the Florida Keys Carrying Capacity Study (FKCCS) will require a Project Cooperation Agreement (PCA) between the DCA and the USACE. The PCA will provide the Federal/non-Federal legal agreement for the development and completion of the FKCCS.

### **Monroe County Planning Background**

The Florida Keys have long been recognized at local, state, and national levels as ecologically rich, culturally significant and environmentally sensitive. Originally the upper Keys were considered for inclusion in the 1947 Federal legislation which created the Everglades National Park, but were later dropped from the proposed legislation.

The Florida Keys were designated in 1974 by the State of Florida as its first “Area of Critical State Concern” due to a renewed emphasis to protect them as a state, national, and international resource. A subsequent legal challenge ensued over that designation. In 1979 the Keys were re-designated as an “Area of Critical State Concern” by the Florida Legislature. It was at this same time that the “Principles for Guiding Development” were established to set local land use planning and land development regulation standards. The “Principles for Guiding Development” gave the rights of review and approval for all local Monroe County planning actions to the State land planning agency. In support, Monroe County was given technical and financial assistance to modify its existing land use planning program to comply with the newer, more rigorous standards. Efforts to reconcile development expectations and property rights with the natural environment were less than adequate despite an improved comprehensive plan and land development regulations which were approved in 1986. Further efforts by Monroe County and the City of Key West resulted in establishing a Rate of Growth Ordinance to limit annual building permits.

### **Study Background**

In 1991, the Monroe County Board of County Commissioners adopted the *Monroe County Year 2010 Comprehensive Plan*. The DCA did not find the plan in compliance with Florida Statute, Section 163.3184(1)(b). Subsequent administrative proceedings, documented by the Hearing Officer, highlight specific aspects of the ecosystem as having already exceeded carrying capacity thresholds such as: nearshore

waters, seagrasses, and the endangered Key Deer. In addition, hurricane evacuation was noted as having reached its upper capacity limit.

In 1996, both the Florida Administration Commission and the Governor, through Executive Order 96-108, called for the preparation of a “carrying capacity analysis” for the Florida Keys. The State of Florida DCA’s pursuit of a Florida Keys Carrying Capacity Study is a logical extension of the ongoing efforts within Monroe County to support a healthy sustainable environment and economy.

### **Scope of Work Approach**

The Corps conducted a “carrying capacity study” literature search and found no previously used analysis to be directly applicable to the unique situation of the Florida Keys. A study approach for the carrying capacity analysis was developed using information obtained from the literature search. A broad approach was chosen where elements of human society would be included as explicit variables in the modeling yet the value of protecting non-human species and the ecological system would establish the fundamental basis for the study.

Several meetings were held and input sought from Monroe County residents, and a multi-discipline, multi-agency, cross-section of interested citizens. Subsequently, the following committees, teams and working groups were created which provided significant contributions to the development of the study outline and SOW: Technical Advisory Committee (TAC ) (see Appendix A), Study Team (see Appendix B), and an Interagency Working Group (see Appendix C). Included within the study is a component for further public involvement and peer review. Critical to the study is an inclusion of both local and national perspectives. Subsequent to finalizing the SOW, an additional peer review was performed in March 1998. The peer review group participants are included in Appendix D. The SOW has also been revised based upon comments from the DCA and the Governor’s office.

### **Study Goal**

The goal of the Florida Keys Carrying Capacity Study is to determine the ability of the Florida Keys ecosystem, and the various segments thereof, to withstand all impacts of additional land development activities. The analysis shall be based upon the findings adopted by the Administration Commission on December 12, 1995, or more recent data that may become available in the course of the study, and shall be based upon the benchmarks of, and all adverse impacts to, the Keys land and water natural systems, in addition to the impact of nutrients on marine resources. The carrying capacity analysis shall consider aesthetic, socioeconomic (including sustainable tourism), quality of life and community character issues, including the concentration of population, the amount of open space, diversity of habitats, and species richness. The analysis shall reflect the interconnected nature of the Florida Keys’ natural systems, but may consider and analyze the carrying capacity of specific islands or groups of islands and specific ecosystems or

habitats, including distinct parts of the Keys' marine system. (*Florida Administrative Weekly*, April 12, 1996)

The FKCCS will provide an information database and an analysis of consequences (i.e. a tool) that may be used to determine the level of land development activities that can be supported by a healthy, balanced, functioning ecosystem in the Florida Keys. This will be accomplished through the identification of component thresholds which define ecosystem sustainability. The study will also provide local, state and federal planners with the information needed for making sound decisions that are critical to a sustainable Florida Keys ecosystem.

### **Study Objectives**

1. Effectively inform and obtain information from Keys citizens through a public involvement and peer review study component.
2. Develop a knowledge base for each element in the study which can be utilized independently and reflect all related studies by various agencies.
3. Define requirements, responses and limiting factors for each key natural resource indicator or species of concern of the Florida Keys ecosystem, identifying and quantifying tolerance limits, wherever possible.
4. Develop relationship(s) that describe the impact that land development activities, humans and associated infrastructure have on the environment in the Florida Keys, e.g. amount and pathways of nutrient and contaminant inputs to nearshore waters.
5. Develop an analysis tool for objective assessment and projection of the outcomes of different scenarios. e.g. affecting aquatic nutrient loads; sustainable tourism; diversity of high quality habitats; aesthetics; and community character issues.
6. Identify areas and the natural resource category requiring restoration efforts to restore ecosystem integrity.
7. Deliver a tool for planning the future of Monroe County.
8. Document the interconnected nature of the Florida Keys ecosystem.
9. Answer questions such as what and sometimes how elements affect reaching the goal of sustainability, while acknowledging that decisions and policies are established in the regulatory, political and public arenas.

## Study Approach

A simplified description of the study approach to be utilized is:

1. Identify indicator species, keystone species and species of concern and natural resource indicators of sustainability for each ecosystem—marine, uplands and wetlands.
2. Collect and synthesize existing data, other applicable study results and Geographic Information System (GIS) coverages,
3. Identify critical data and essential study gaps and obtain the data or perform the study,
4. Populate databases and GIS coverages,
5. Determine scientifically derived requirements, responses and limiting factors for natural resources and species of concern, identifying and quantifying tolerance limits, wherever possible,
6. Develop relationship(s) that describe the impact that humans and associated infrastructure have on the environment in the Florida Keys, e.g. amount and pathways of nutrient and contaminant inputs to nearshore waters, and
7. Develop interactive computer driven model(s) that interfaces databases; GIS coverages; natural resource or species of concern requirements, responses, limiting factors, and tolerance limits; and relationships that describe human/infrastructure impacts on the environment.