

# Everglades National Park • Florida

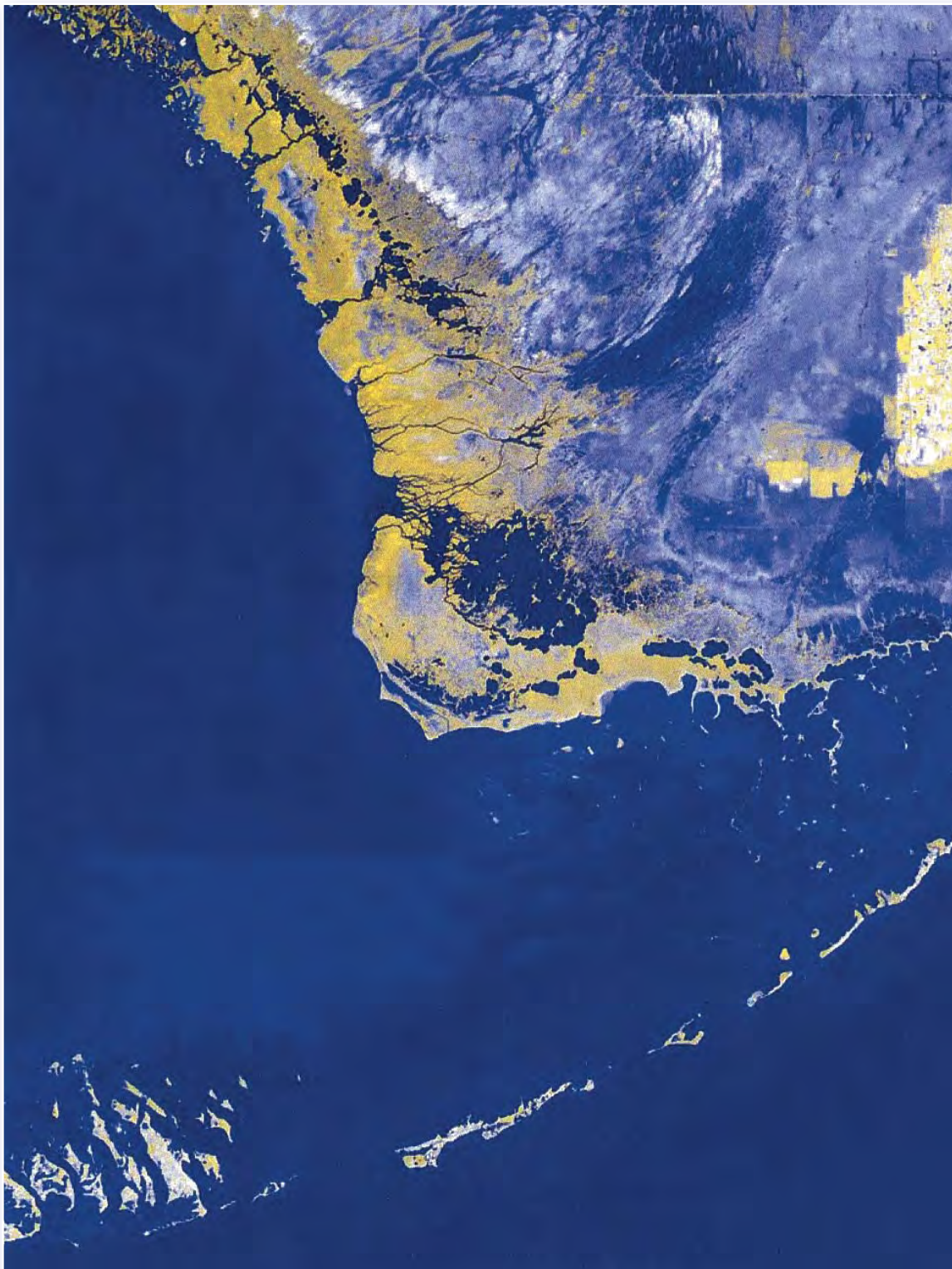
National Park Service  
U.S. Department of the Interior



## Cape Sable Canals Dam Restoration Project Environmental Assessment / Assessment of Effect

June 2009

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## EXECUTIVE SUMMARY

The National Park Service (NPS) proposes to repair or replace the failed dams on the East Cape Extension and Homestead canals within the Cape Sable area of Everglades National Park. This project is intended to provide more sustainable solutions to issues associated with saltwater intrusion into and degradation of freshwater and brackish marshes north of the marl ridge; illegal motorized boat access into the Marjory Stoneman Douglas Wilderness area; and unsafe conditions for motorized and non-motorized boaters at the dam sites.

The Cape Sable region extends from the southwestern tip of Florida, within Everglades National Park, into the Gulf of Mexico and Florida Bay. The cape contains stretches of shell beaches fringed by a mix of mangrove trees and marsh. Beyond the mangroves lies Lake Ingraham, the largest of the cape's lakes. The lake is backed by a narrow marl ridge that shelters the cape's numerous interior marshes.

In the early 20<sup>th</sup> century, a network of canals was dredged through the marl ridge to drain the cape's interior marshes for use in agriculture and cattle grazing. These canals have triggered substantial changes in the ecology of the area. Incoming tides now push marine waters and sediments inland, increasing salinity and transporting sediments to lakes and marshes. Outgoing tides flush freshwater from marshes north of the marl ridge and transport sediments toward Lake Ingraham and Florida Bay.

As a result, the previously freshwater ecosystems of Cape Sable have experienced substantial change from exposure to the sea. The incursion of saltwater into formally freshwater marsh systems as the result of man-made connections between fresh and saltwater habitats has led to the physical collapse of these marshes. Peat soil is lost and freshwater marsh communities are being replaced by open water saline communities. Higher salinity in the interior marshes may have altered vegetation communities, reduced the quality of wildlife habitat, and lowered the productivity of forage fishes, potentially impacting the survival of various wading birds. These changes are compromising the function of coastal habitats that are important to recreational fish, and other plants and animals dependent on the cape for survival.

The constant movement of water through manmade canals on the cape has led to the widening of several canals, resulting in a substantial loss of coastal habitat as well as exacerbating sediment deposition in the cape's open waters (i.e., converting Lake Ingraham into a tidal mud flat). As the canals on Cape Sable continue to widen, it is believed the rate of change would continue to accelerate, emphasizing the need for timely corrective action. The existing failed sheetpile dams (see Chapter 1 for a description of the existing failed sheetpile dams) currently allow illegal access to the designated wilderness area by motorized boats and are a safety hazard for non-motorized boaters attempting to navigate the strong current moving through the dam breaches or approaching the dams during spring tides. Furthermore, while this landscape is naturally dynamic, slowing the rate of human-induced change on this landscape may also bring about greater resilience to the expanded study area in the face of predicted sea level rise and the possibility of more frequent and intense hurricanes.

The NPS has long recognized the importance of addressing impacts from the Cape Sable canals. Stopping tidal flow into the cape's interior marshes is the key to revitalizing the function of these freshwater marshes. The NPS plugged several of the canals at the marl ridge with earthen dams in the late 1950s and early 1960s. Over time, natural forces compromised two of these early structures and, by 1992, they had failed. The earthen dams were replaced in 1997 with sheetpiling dams, though these also failed after a few years, possibly due to vandalism, and lack of armoring.

Thus, based on preliminary analysis, internal scoping, and public input, the NPS developed a range of new design alternatives to either repair or replace the existing failed dams at the East Cape Extension and Homestead canals. Each alternative design also considers the need for structural longevity (at least 50 years). Three action alternatives for the East Cape Extension canal and five action alternatives for the Homestead canal were carried forward for analysis in this EA along with the no action alternative for both dam sites:

### ***East Cape Extension Canal and Homestead Canal Alternatives***

#### **Alternative A: No Action - Continue Current Management**

The No-Action alternative involves leaving the existing sheetpile in the East Cape Extension and Homestead canals where it is today and allowing the channels to continue to widen through natural erosional processes. This alternative would fail to accomplish the goals of the NPS, which are to meet the project objectives of improving fish and wildlife habitat, correct safety hazards associated with the failed structures, and preventing motorized vessel entry into designated wilderness.

#### **Action Alternative C – Repair in Place**

Repairing the existing steel sheetpile walls includes extending them further into the banks of the Marl Ridge. This alternative strengthens the existing dams by adding additional sheetpile landward on both sides of the dams. The landward sheetpile would be installed to form a flow deflector wingwall to prevent seepage and tunneling through the marl. The deflector wingwalls would also help to prevent illegal motorized boat entry into the wilderness area minimizing opportunities for vandals to alter the banks beyond the edge of the sheetpile walls. Graded riprap and fill material would be placed along the deflector wingwalls and the exposed canal banks to provide erosion resistance. The repair of the existing dams would also include an engineering component to provide safe passage over the restored dam for non-motorized boaters (canoeists/kayakers). In addition to the above, Action Alternative C for the Homestead canal dam site would require dredging a 52-foot wide by approximately 8,320 feet long temporary access channel within Lake Ingraham from the western terminus of the Ingraham canal to the Homestead canal due to the shallow water depths of Lake Ingraham. The dredged material would be temporarily stockpiled in areas adjacent to the dredged channel or other suitable area and pulled back into the channel upon completion of construction.

#### **Action Alternatives D (New 100' Plug – Marl Ridge Location) and G (New 370'/430' Plug – Marl Ridge Location)**

This alternative includes the extraction and relocation of the existing free-standing sheetpile walls (previous dam structures) to narrower more suitable locations that are in better alignment with the marl ridge. Additionally, earthen plugs would be constructed by installing a second sheetpile wall upstream or downstream of the first wall within the canals. For Alternative D, the two sheetpile walls would be placed a distance of approximately 100 feet apart, and for Alternative G, the two sheetpile walls would be placed a distance of approximately 370 feet (for the East Cape Extension canal dam site) or 430 feet (for the Homestead canal dam site) apart. The area between the two walls would be filled with sand and topped with suitable top soil for the planting of wetland vegetation to reduce the potential for erosion. Landward sheetpile would be installed in all four quadrants of the plugs to form flow deflector wingwalls to promote surface sheetflow away from the dam structures and thus prevent seepage and tunneling through the marl. The deflector wingwalls would also help to prevent illegal motorized boat entry into the wilderness area minimizing opportunities for vandals to alter the banks beyond the edge of the sheetpile walls. Fill material would be placed adjacent to each sheetpile wall to substantially increase the lateral support for the dams. Graded riprap would also be placed on top of the fill

material along the outside face of the sheetpile walls, along the deflector wingwalls and along the exposed canal banks to provide erosion resistance. These alternatives would also include an engineering component to provide safe passage over the restored dams for non-motorized boaters (canoeists/kayakers).

Action Alternative D or G for the Homestead canal dam site would require dredging a 52-foot wide by approximately 8,320 feet long temporary access channel within Lake Ingraham from the western terminus of the Ingraham canal to the Homestead canal due to the shallow water depths of Lake Ingraham. The dredged material would be temporarily stockpiled in areas adjacent to the dredged channel or other suitable area and pulled back into the channel upon completion of construction.

### ***Homestead Canal Modified Alternatives***

Impact minimization efforts have been considered during this study to reduce impacts to the adjacent wetland/surface water systems to the maximum extent possible while maintaining safe and sound engineering and construction practices. Therefore, modified alternatives of the above described Action Alternative D and Action Alternative G were developed and carried forward in the EA for further analysis for the Homestead canal only. These modified alternatives provide a construction option for the Homestead canal dam site (only) that allows for further avoidance and minimization of impacts to natural resources through eliminating the need to dredge the 52-foot wide by approximately 8,320 feet long navigational channel through Lake Ingraham as described above for Alternatives D and G for dam site access.

#### **Action Alternatives D1 (New 100' Plug – Geotubes) and G1 (New 430' Plug – Geotubes)**

Dredging of an access channel in Lake Ingraham would not be required with these modified alternatives because geotubes would supplant the proposed sheetpile walls associated with Alternatives D and G. Geotubes are large tubular sand bags that are filled in place by pumping sand or slurry through a pipe from a barge. They are typically used to build structures such as breakwaters, shoreline protection or island creation. For this modified alternative, fill material would be transported to the Homestead canal work area through a floating pipeline. The 6 to 8 inch pipeline would be constructed using a shallow draft barge and would run approximately 1.5-2 miles from the work area to a large barge located at a designated staging area at the western terminus of the Ingraham canal (eastern mouth of Lake Ingraham). The water depths within the Ingraham canal are sufficient and would not require dredging. Fill material would be transported to the staging area at the Ingraham canal and conveyed through the pipe via hydraulic pumping to the work area at the Homestead canal in order to avoid potential adverse impacts to the lake from dredging activities. These alternatives include the extraction and removal of the existing free-standing sheetpile walls (previous dam structures). For Alternative D1, two sets of geotubes would be placed in the canal and spaced approximately 100 feet apart. For Alternative G1, two sets of geotubes would be placed in the canal and spaced approximately 430 feet apart. The geotubes would be filled with sand or other suitable material. The area between the geotubes would be filled with sand and topped with suitable top soil for the planting of wetland vegetation to reduce the potential for erosion. Graded fill and riprap would be placed over a non-woven geotextile fabric on top of the geotubes for reinforcement to minimize the potential for damage to the geotubes as a result of natural erosional processes as well as vandalism. These alternatives would require aerial transportation of the riprap to the Homestead canal work area from the Lake Ingraham staging area (approximately 1.3 miles each way) using a helicopter. These alternatives would also include an engineering component to provide safe passage over the restored dam for non-motorized boaters (canoeists/kayakers). In addition, the existing sheetpile dam would be cut off at a suitable level using a torch in place

of extracting the sheetpile with heavy equipment as with Alternatives D/G. The sheetpile would be removed for safety.

The following table (see Table E.1) provides a summary of estimated costs associated with each of the action alternatives with separate entries for: (1) Class C<sup>1</sup> costs, (2) life cycle costs, and (3) compliance costs. Life cycle costs include long-term maintenance and monitoring costs, revegetation costs, enforcement actions and inspection costs, Compliance costs include environmental permitting costs, and all associated surveys, including, but not limited to: benthic surveys in Lake Ingraham and canals, archaeological surveys, wetland surveys and special status species surveys. Further information regarding these costs is detailed in Tables 2.4 through 2.11.

**Table E.1 – Summary of Costs**

Failed Dam Site	Alt. C	Alt. D	Alt. D1	Alt. G	Alt. G1
<b>East Cape Extension Canal (ECEC) Class C Cost</b>	<b>\$2,509,225</b>	<b>\$4,006,617</b>	<b>N/A</b>	<b>\$6,570,367</b>	<b>N/A</b>
<b>ECEC Life Cycle Cost</b>	<b>\$2,058,412</b>	<b>\$672,327</b>	<b>N/A</b>	<b>\$692,627</b>	<b>N/A</b>
<b>ECEC Compliance Cost</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>N/A</b>	<b>\$200,000</b>	<b>N/A</b>
<b>ECEC Total Cost</b>	<b>\$4,767,637</b>	<b>\$4,878,944</b>	<b>N/A</b>	<b>\$7,462,994</b>	<b>N/A</b>
<b>Homestead Canal (HC) Class C Cost</b>	<b>\$4,237,841</b>	<b>\$6,398,121</b>	<b>\$5,367,003</b>	<b>\$9,961,511</b>	<b>\$9,036,375.</b>
<b>HC Life Cycle Cost</b>	<b>\$2,083,412</b>	<b>\$1,415,255</b>	<b>\$1,445,255</b>	<b>\$1,045,867</b>	<b>\$1,075,867</b>
<b>HC Compliance Cost</b>	<b>\$250,000</b>	<b>\$250,000</b>	<b>\$200,000</b>	<b>\$250,000</b>	<b>\$200,000</b>
<b>HC Total Cost</b>	<b>\$6,571,253</b>	<b>\$8,063,376</b>	<b>\$7,012,258</b>	<b>\$11,257,378</b>	<b>\$10,312,242</b>

Based on the impacts analysis conducted for the above alternatives, the following table (see Table E.2) provides a summary of the environmental impact intensity for each impact topic.

**Table E.2 – Long-Term Environmental Impact Intensity Summary**

Impact Topic	Alt. A	Alt. C	Alts. D and G	Alts. D1 and G1
Geology, Topography and Soils	Moderate to major adverse (soils); Negligible adverse (geology and topography)	Beneficial	Beneficial	Beneficial
Hydrology	Moderate to major adverse	Beneficial	Beneficial	Beneficial
Water Quality	Moderate to major adverse	Beneficial	Beneficial	Beneficial
Vegetation and Wetlands	Moderate to major adverse	Beneficial	Beneficial	Beneficial
Wildlife and Habitat	Minor to moderate adverse	Beneficial	Beneficial	Beneficial
Marine Resources and Essential Fish Habitat	Minor to moderate adverse	Beneficial	Beneficial	Beneficial
Special Status Species	Moderate to major adverse	Beneficial	Beneficial	Beneficial

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<sup>1</sup> “Class C” costs were estimated for each of the alternatives based on unit prices obtained from vendors and R.S. Means (see Class C cost estimates for the East Cape Extension and Homestead canals at the end of Chapter 2 of this document). Class C estimates are cost estimates that occur at the conceptual level of planning. All estimates for construction include government factors to account for the remote location, federal wage rate factor, design contingency, government general conditions, prime fees, contracting method adjustment, and escalation. All of these estimates were based on single-unit costs, and costs were not adjusted to account for possible volume discounts or similar cost savings; therefore, these figures are very conservative, and are represented in 2009 dollars.

Impact Topic	Alt. A	Alt. C	Alts. D and G	Alts. D1 and G1
Wilderness	Moderate to major adverse	Beneficial	Beneficial	Beneficial
Cultural Resources	Minor to moderate adverse	Beneficial	Minor to moderate adverse and Beneficial	Minor to moderate adverse and Beneficial
Visitor Use and Experience	Moderate adverse	Beneficial	Beneficial	Beneficial
Park Management and Operations	Minor adverse	Minor adverse	Beneficial	Beneficial

Key issues were raised by the public and the environmental agencies during the scoping phase of the project. These key issues include wetland impacts/mitigation, cost, potential impacts to protected species, visitor use and experience relating to portage, and sea level rise. A brief summary of the analysis of these key issues follows:

- Wetland impacts/mitigation: Impact minimization efforts have been considered during this study to reduce impacts to the adjacent wetland/surface water systems to the maximum extent possible while maintaining safe and sound engineering and construction practices. Unavoidable wetland impacts would occur since the project is wetland dependent and constructed entirely within wetlands/surface waters. Construction activities would result in adverse, localized, direct effects on vegetation. However, the action alternatives would provide an overall benefit to local and regional wetlands in the greater Cape Sable area, which far outweigh the direct impacts associated with construction. Although existing wetland vegetation would be impacted with construction, the upstream and downstream cumulative benefits to existing wetland functions for Lake Ingraham and the interior marshes of Cape Sable far outweigh the wetland functional loss derived from the implementation of Alternatives C, D, G, D1 or G1.
- Cost: Comments were received pertaining to the costs of this project. The most cost effective and financially feasible options should be on the project short list (including sheetpile and geotube alternatives). A detailed cost analysis has been performed to determine the most cost-effective alternatives.
- Potential Impacts to Protected Species: The proposed project should not result in adverse impacts to protected species. The analysis shows that all protected species would benefit in the long term from improved hydrologic conditions and reduced saltwater intrusion. Additionally, protection would be afforded to protected species during construction through the implementation of standard protection measures.
- Visitor use and experience relating to portage: Visitors concerns included the retainage of access and existing resources in the Cape Sable area. Another concern was the prevention of motorboats from going inland from the dams into the interior wilderness area. In order to comply with these issues, all of the proposed alternatives would include the following:
  - Safe portage would be provided with each alternative. Elevated dock structure(s) (approximately 10-ft by 10-ft) would be constructed in the center of each dam with ladder(s) to allow for access. For the plug/dam alternatives, a hardened path would be installed across the proposed plug/dam using articulated block riprap (interlocking mats) to provide safe and sustainable passage across the plug/dam.

- Floating mooring buoys would be installed downstream (towards Lake Ingraham) of the dam structures for motorized vessel anchoring. Marine anchors would be utilized to secure the mooring buoys to the canal bottom to minimize potential substrate disturbance with installation.
- Repair of the existing breached dam would prevent illegal motorized boat entry into the wilderness area. The proposed structures would include deterrents such as riprap and wingwalls to minimize the potential for vandals to attempt to alter the banks of the canal beyond the outer edges of the dam.
- Sea level rise: Climate change and the resulting sea level rise are affecting all of South Florida, especially the lowlying Cape Sable area. The 2001 report of the United Nations sponsored Intergovernmental Panel on Climate Change (IPCC) projected an additional sea level rise over the coming century of one to three feet (median sea level rise of two feet) (IPCC, 2001). The 2007 IPCC report projected a somewhat lower level, but it did not incorporate the substantially accelerated melting being observed in the Greenland Ice Sheet (IPCC, 2007a). While all these environmental impacts would affect South Florida and Everglades National Park within the next century, the key concern for the lowlying Cape Sable area would be rising sea level, “with a very high likelihood” that the sea level would rise an additional 1.5 feet in the next 50 years and a cumulative total of three to five feet within a century (CCATF, 2008). The impacts from a 1.5 foot sea level rise would be gradual with increasing impacts over time. Spring high tides would overtop the dam and inundate portions of the Cape Sable system at an increasing rate and intensity each year. Wildlife, vegetation, cultural resources, and other natural resources would be impacted by the increasing amount and duration of saltwater in the interior freshwater and brackish marshes of Cape Sable. While slowing the rate of sea level rise is beyond the resources of the park, these impacts would be mitigated in the short-term to intermediate-term time frame by the construction of any of the proposed dam structures (Alternatives C, D, D1, G, or G1). The dams would reduce the intensity and duration of saltwater entering the interior freshwater and brackish Cape Sable marshes via the East Cape Extension and Homestead canals. The slowing or postponement of impacts by the construction of dams would allow time for the interior marshes of Cape Sable (including the wildlife and vegetation) to restabilize and recover from the current impacts caused by the breached dams and allow more time for the system and resources to adjust to the changes caused by climate change and sea level rise. However, it is important to note that climate change and sea level rise research is not an exact science and there is not a complete consensus on the estimates, as shown in the two IPCC reports and the Miami-Dade County CCATF report referenced above.

### ***Public Review and Comment***

This EA will be available for public review for 30 days. If you wish to comment, you are encouraged to submit your comments directly on the NPS Planning, Environment, and Public Comment (PEPC) website. Please E-mail comments through the NPS PEPC planning website: <http://parkplanning.nps.gov>, select “Everglades National Park” from the drop down box, and follow the links for the Cape Sable Canals Dam Restoration Project/EA. The “Open For Public Comment” link on the left column provides access to the EA. The “Document List” link provides a list of South Florida libraries that have paper copies available for review. The public may also contact the park at (305) 242-7700 to find out South Florida library locations or to request a CD of the EA. If prompted by voice mail, press “2” at 1st prompt and “5” at 2<sup>nd</sup> prompt to leave mailing information. A limited number of paper copies of the Draft Plan are also available. Another option is to mail comments to the name and address provided below:

Please mail written comments to:

Everglades National Park  
Attn: Dewitt Smith, Cape Sable EA  
40001 State Road 9336  
Homestead, FL 33034

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment — including your personal identifying information — may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.



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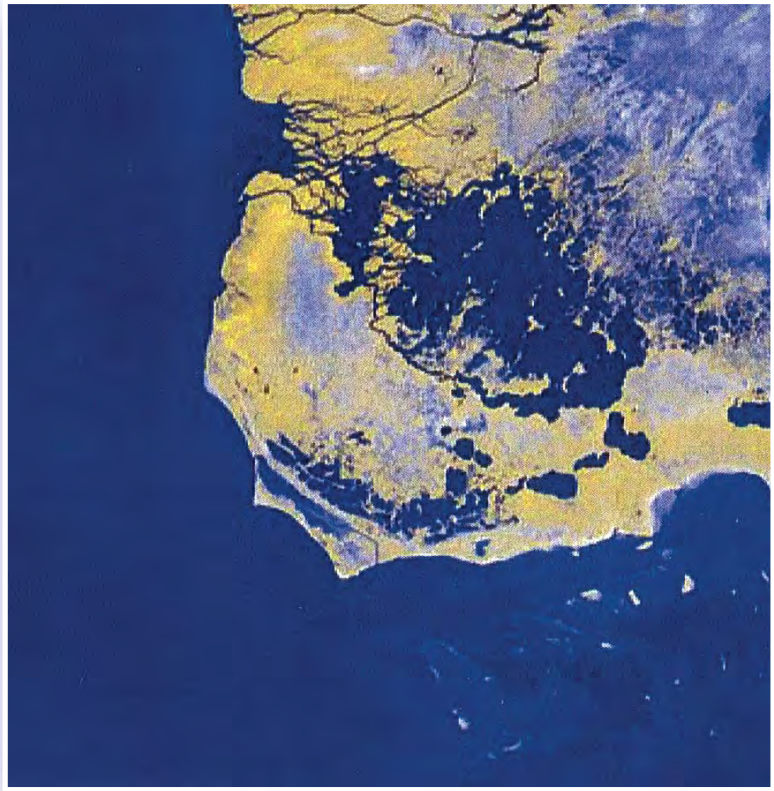
## **APPENDICES**

Appendix A	Wetlands Statement of Findings
Appendix B	Consultation/Coordination Documents
Appendix C	Scoping Newsletter
Appendix D	Value Analysis/Choosing By Advantages Report



# Chapter 1

## Purpose Of and Need for Action



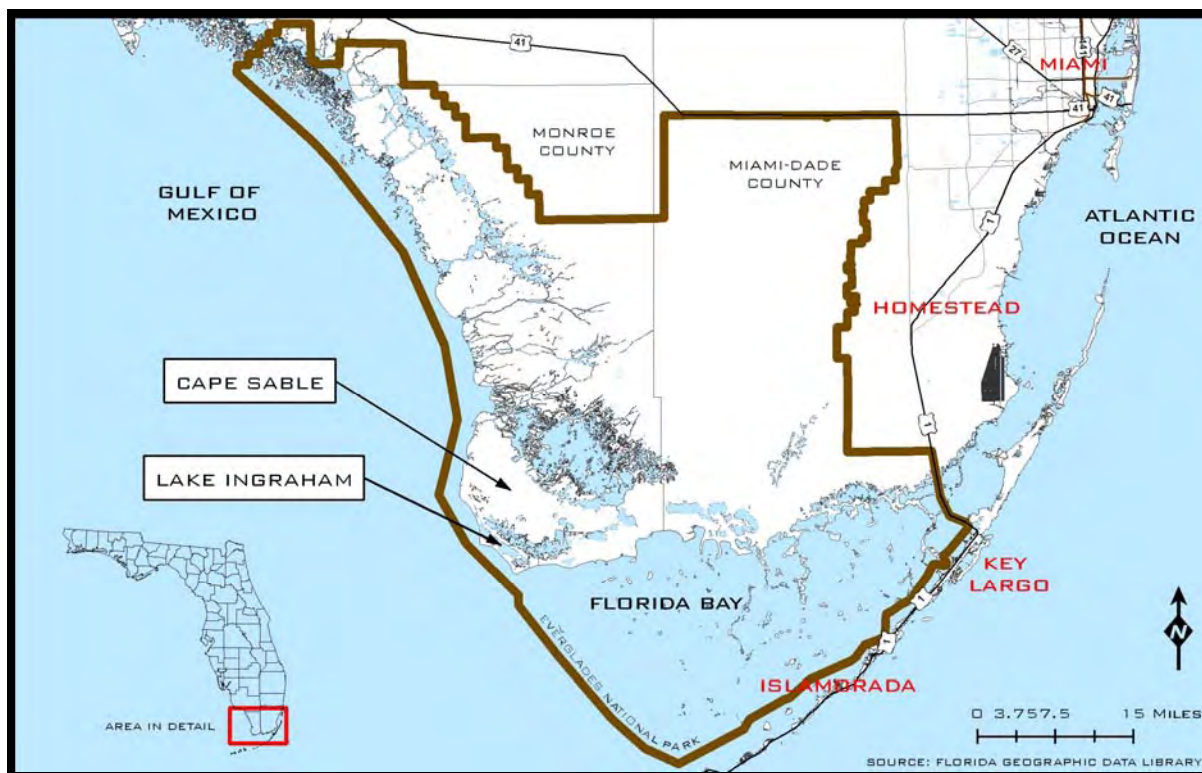


## CHAPTER 1: PURPOSE AND NEED FOR ACTION

### 1.0 Introduction

Everglades National Park is one of 391 units of the National Park System administered by the National Park Service, U.S. Department of the Interior. Established in 1947, the park's original boundaries contained 460,000 acres. Subsequent legislation increased its size to 1,509,000 acres, including most of Florida Bay. The most recent addition came in 1989 when Congress added 109,506 acres in the East Everglades area of the park, including a portion of the Northeast Shark River Slough, a waterway that is critical for the protection of park resources and hydrologic restoration.

The Cape Sable peninsula extends from the southwestern tip of Florida, within Everglades National Park, into the Gulf of Mexico and Florida Bay. The cape contains stretches of shell beaches fringed by a mix of mangrove trees and marsh (see Figure 1.1 – Cape Sable Location Map).



**Figure 1.1 – Cape Sable Location Map**

Beyond the mangroves lies Lake Ingraham, the largest of the cape's lakes. The lake is backed by a narrow marl ridge that shelters the cape's numerous interior freshwater to brackish marshes.

In the early 20<sup>th</sup> century, a network of canals was dredged through the marl ridge to drain the cape's interior marshes for use in agriculture and cattle grazing. These canals have triggered substantial change in the ecology of the area. At least seven canals were constructed, exposing the cape's interior marshes and lakes to Florida Bay and the Gulf of Mexico. Incoming tides now push marine waters and sediments inland, increasing salinity and transporting sediments to lakes and marshes. Outgoing tides flush freshwater from marshes north of the marl ridge and transport sediments toward Lake Ingraham and Florida Bay.

The constant movement of water through man-made canals on the cape has led to the widening of several canals. The main East Cape canal has widened from 20 feet to more than 300 feet, resulting in a substantial loss of coastal habitat. The expansion of these canals has exacerbated sediment deposition in the cape's open waters and is converting Lake Ingraham into a tidal mud flat.

The freshwater ecosystems of Cape Sable have experienced substantial change from exposure to the sea. The incursion of saltwater into formally freshwater marsh systems as the result of canal building and sea level rise has led to the physical collapse of these marshes. Peat soil is lost and freshwater marsh communities are being replaced by open water saline communities. Higher salinity in the interior marshes has altered vegetation patterns, reduced the quality of wildlife habitat, and lowered the productivity of forage fishes, potentially impacting the survival of various wading birds. Higher salinity in interior marshes reduces juvenile crocodile habitat suitability and lowers the productivity of forage fishes; thereby, potentially affecting the ability for wading birds and other fauna to forage efficiently. Greater volumes of seawater and sediment entering the lakes and marshes have brought about changes that are compromising the function of coastal habitats important to sea turtles, recreational fish, and other plants and animals dependent on the cape for survival. As the canals on Cape Sable continue to widen, it is believed the rate of change would continue to accelerate, emphasizing the need for timely corrective action. In addition, the existing failed sheetpile dams allow illegal access to the area by motorized boats and are a safety hazard for non-motorized boaters attempting to navigate the strong current moving through the dam breaches or approaching the dams during spring tides.

The National Park Service (NPS) has long recognized the importance of addressing impacts from the Cape Sable canals. Stopping tidal flow into the cape's interior marshes is the key to revitalizing the function of these freshwater marshes. While this landscape is naturally dynamic, slowing the rate of human-induced change on this landscape may also bring about greater resilience to the cape in the face of predicted sea level rise and the possibility of more frequent and intense hurricanes.

The NPS plugged several of the canals at the marl ridge with earthen dams in the late 1950s and early 1960s. Over time, natural forces compromised two of these early structures and, by 1992, they had failed. The earthen dams were replaced in 1997 with sheet-piling dams, though these also failed after a few years, possibly due in part to vandalism, which increased erosion of the canal banks. Openings at the failed plugs continue to widen, due to erosional processes, and transport marine waters eastward along the Homestead Canal as far as Bear Lake. These structures are located along the East Cape Extension and Homestead canals (see Figure 1.2 - Failed Dam Locations).

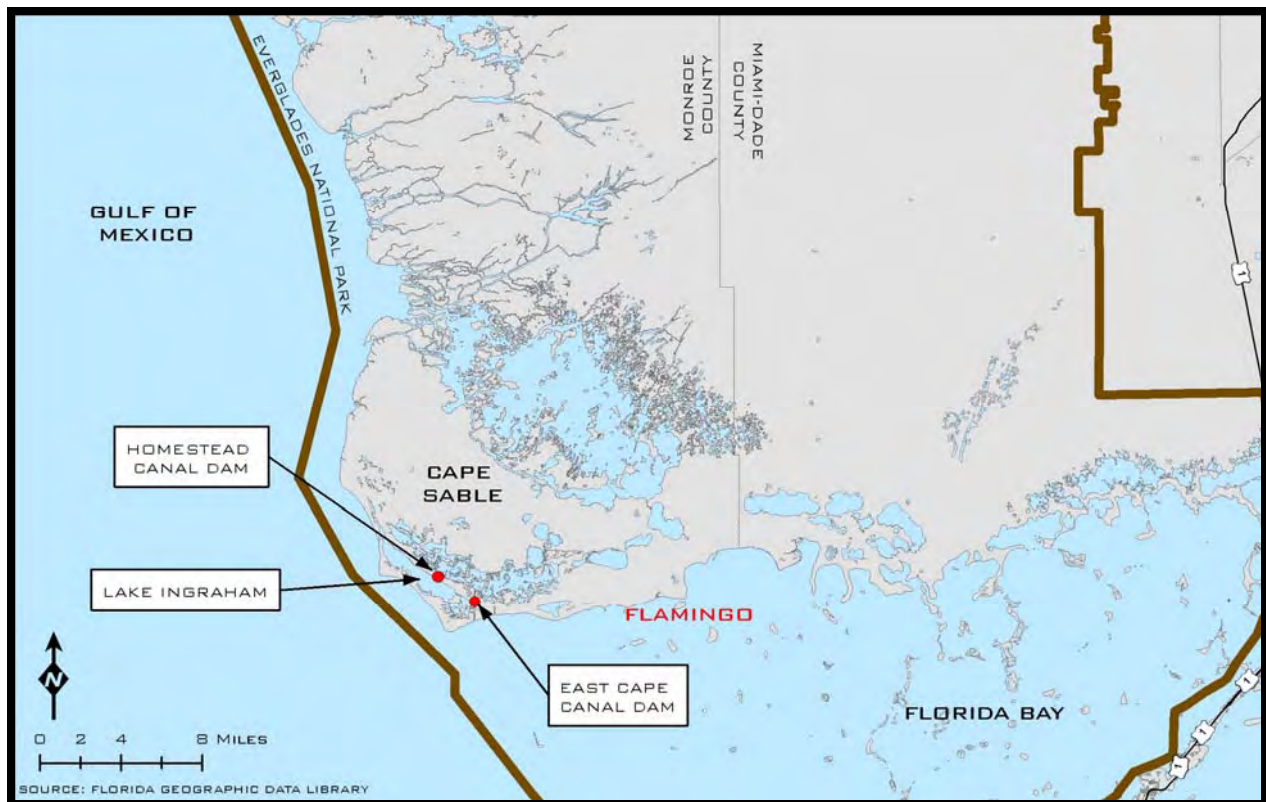
This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR 1500-1508, and NPS Director's Order 12 and Handbook, *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS, 2001a).

## **1.0.1 Purpose and Need for Action**

### **1.0.1.1 Purpose of the Project**

"Purpose" is an overarching statement of what the project must do to be considered a success. The purpose of this project is to restore the failed dams on the Homestead and East Cape canals in the Cape Sable area of Everglades National Park. This project is intended to provide sustainable solutions to issues associated with saltwater intrusion into and degradation of

freshwater and brackish marshes north of the marl ridge; illegal motorized boat access into the Marjory Stoneman Douglas Wilderness area; and unsafe conditions for motorized and non-motorized boaters at the dam sites.



**Figure 1.2 - Failed Dam Locations**

### **1.0.1.2 Need for Action**

“Need for Action” describes why action is required. It summarizes the most important points of the planning issues and provides the reasons the project is needed at this time.

Restoration of the failed dams is needed to ...

- Control the canal-induced intrusion of saltwater into freshwater and brackish marshes north of the Cape Sable marl ridge
- Restore the existing dams, installed in the late 1950s and replaced in the 1980s and 1990s, which have failed, so they can function effectively
- Protect the freshwater and brackish interior marshes and surrounding areas, which serve as habitat for fish and wildlife
- Reduce illegal motorized boat entry into the Marjory Stoneman Douglas Wilderness Area
- Restore safe conditions at the dam sites, which are a safety hazard to motorized and non-motorized boaters

### **1.0.2 Objectives in Taking Action**

Objectives are “what must be achieved to a large degree for the action to be considered a success” (*Director’s Order 12*). All alternatives selected for detailed analysis must meet project

objectives to a large degree and resolve the purpose and need for action. Objectives must be grounded in the park's enabling legislation, purpose, significance, and mission goals and be compatible with direction and guidance provided by the park's general management plan, strategic plan, and/or other management guidance. The following are the objectives related to the restoration of the failed dams in the Cape Sable area. The objectives are grouped by subject and are based on the needs previously presented.

#### **1.0.2.1 Natural Resources**

- Restrict the flow of saltwater into freshwater and brackish marshes north of the Cape Sable marl ridge through these canals, thereby restoring the natural hydrology of the area
- Reduce freshwater loss from freshwater and brackish interior marshes through the East Cape and Homestead canals
- Improve habitat for juvenile crocodiles, wading birds, forage fish and other wildlife within the freshwater and brackish marshes north of the marl ridge
- Slow the rate of marsh collapse and loss of sediment and nutrients from the interior freshwater and brackish marshes
- Reduce/eliminate adverse impacts to marine resources

#### **1.0.2.2 Cultural Resources**

- Avoid adverse impacts to the Homestead and East Cape canals, which are historic structures, through project design or mitigation measures

#### **1.0.2.3 Replacement Structure Longevity**

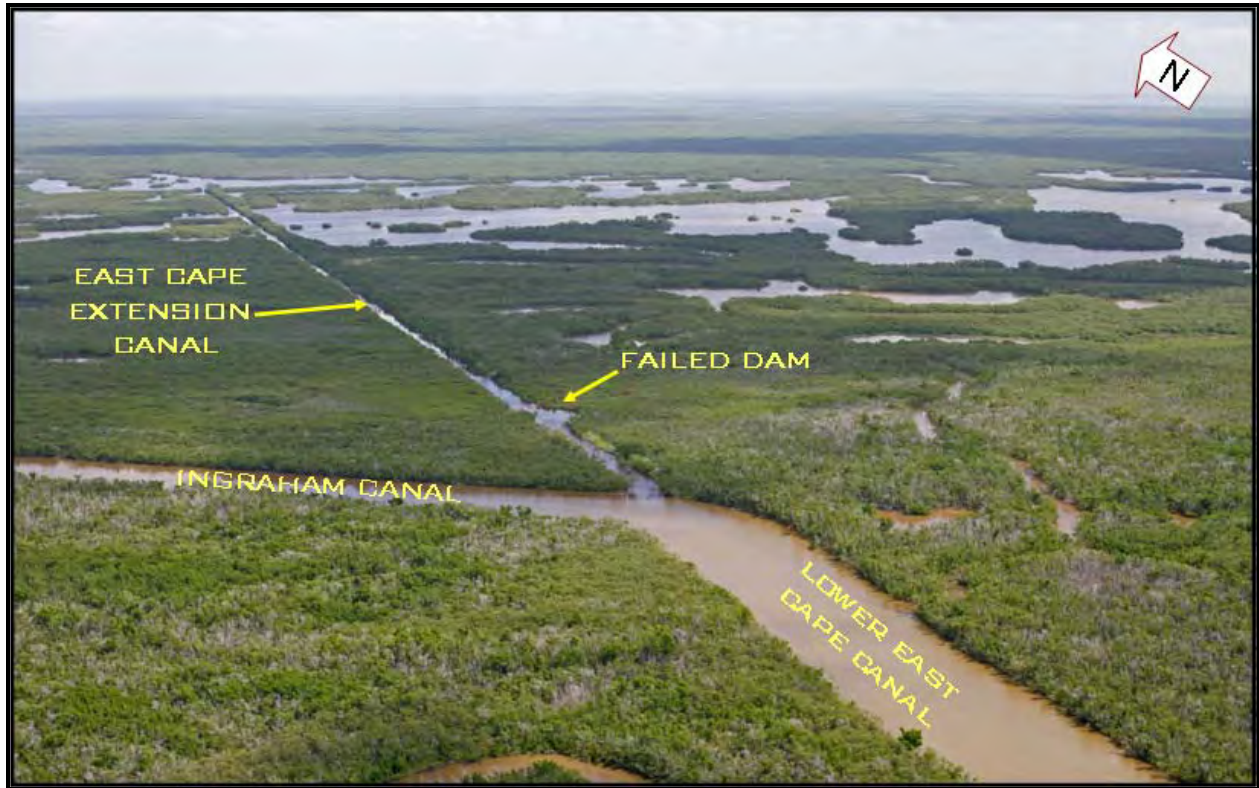
- Replacement dams or geotubes should be designed to prevent vandals from breaching a dam by trenching around or through it, or damaging the geotubes
- Replacement structures should be designed to last at least 50 years (barring severe damage by catastrophic hurricane events) with annual/bi-annual maintenance

#### **1.0.2.4 Visitor Use and Experience**

- Provide safe passage over restored dams for canoeists/kayakers
- Resolve safety issues associated with the existing failed sheetpile structures
- Improve the wilderness visitor experience by eliminating/reducing illegal motorized boat entry into the Marjory Stoneman Douglas Wilderness Area

### **1.0.3 Project Site Locations and Scope of the Analysis**

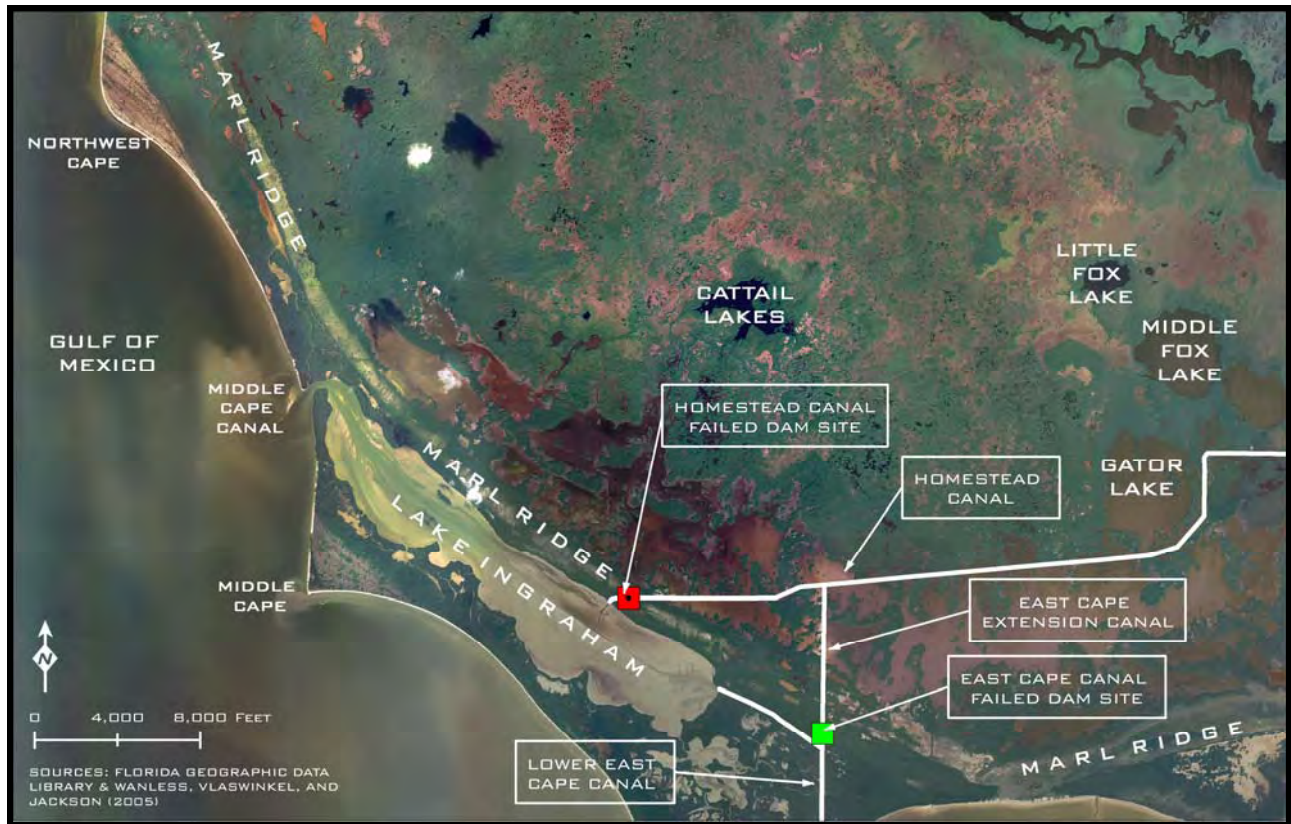
The focus of this analysis is to determine the best alternative for restoring the failed sheetpile dams at the East Cape Extension and Homestead canals in Cape Sable in Everglades National Park. Therefore, the primary study area to be assessed includes the area along the marl ridge of Cape Sable in Everglades National Park in the immediate vicinity of the existing East Cape Extension and Homestead canal failed dam structures (see Figure 1.3 – East Cape Extension Canal Failed Dam Study Area and Figure 1.4 – Homestead Canal Failed Dam Study Area). Depending on the resource being assessed, the study area may also include areas that would receive indirect or secondary impacts as a result of the proposed action alternatives. The expanded study area includes Lake Ingraham, the East Cape Canal, and the freshwater and brackish interior marshes beyond the existing failed dams (see Figure 1.5 – Expanded Study Area). The area of potential effect is defined for each resource in Chapter 3 of this document.



**Figure 1.3 – East Cape Extension Canal Failed Dam Study Area**



**Figure 1.4 – Homestead Canal Failed Dam Study Area**



**Figure 1.5 – Expanded Study Area**

## **1.1 Purpose and Significance of Everglades National Park**

### **1.1.1 Enabling Legislation**

Authorized as a unit of the NPS on May 30, 1934, the park is one of 391 units of the National Park System administered by the NPS. Congress authorized the establishment of Everglades National Park to be "...wilderness where no development...or plan for the entertainment of visitors shall be undertaken which would interfere with the preservation of the unique flora and fauna of the essential primitive natural conditions now prevailing in the area." Dubbed by opponents as the "alligator and snake swamp bill," the legislation stalled during the Great Depression and World War II. Finally, on December 6, 1947, President Harry S. Truman dedicated Everglades National Park (NPS, 2001b).

### **1.1.2 Purpose and Significance**

The following provides the purpose and significance for Everglades National Park, which must be taken into account in any park planning.

**Purpose** – Everglades National Park is a public park for the benefit of the people. It is set aside as a permanent wilderness preserving essential primitive conditions including the natural abundance, diversity, behavior, and ecological integrity of its flora and fauna.

**Significance** – Significance statements capture the essence of the park's importance to our country's natural and cultural heritage. Significance statements represent the park's distinctiveness and help to place the park within its regional, national, and international context.

Everglades National Park is nationally and internationally significant because:

- It is the only place in the United States designated as a World Heritage site, an International Biosphere Reserve, and a Wetland of International Significance.
- It comprises the largest designated subtropical wilderness reserve on the North American continent (1,296,000 acres). The park contains vast subtropical upland and marine ecosystems, including freshwater marshes, tropical hardwood, rock pineland, extensive mangroves and seagrass ecosystems that support world-class fisheries.
- It serves as a sanctuary for the protection of more than 20 federal- and 70 state-listed rare, threatened and endangered species.
- It provides important foraging and breeding habitat for more than 400 species of birds (including homeland to world-renowned wading bird populations), and functions as a major corridor for migratory bird populations.
- It includes archaeological and historical resources spanning about 5,000 years of human history. These range from prehistoric sites revealing a fishing-hunting-gathering adaptation to a tropical environment (unique within the continental United States), to surviving structures from a Nike missile installation constructed in the early 1960s as a part of South Florida's Cold War defenses.
- It preserves natural and cultural resources associated with the past and present homeland of Native Americans of Florida (including the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and the Seminole Nation of Oklahoma).

### **1.1.3 General Park Background**

Spanning the southern tip of the Florida peninsula and most of Florida Bay, Everglades National Park is the largest subtropical wilderness in North America. The park is only a portion of the Everglades fragile ecosystem. Everglades National Park provides a prime example of the systemic linkages between national parks, the larger ecosystem, and surrounding communities (NPS, 2001b). The park's original boundaries contained 460,000 acres; subsequent additions to the park have increased its size to 1,509,000 acres, including most of Florida Bay. The most recent addition came in 1989 when Congress added 109,506 acres in the East Everglades area of the park, including a portion of the Northeast Shark River Slough—a waterway critical for the protection of park resources (over 220 significant archeological and historic sites) and hydrologic restoration. The park stretches more than 60 miles north-to-south and 40 miles east-to-west. It holds the largest expanse of wilderness east of the Rocky Mountains. Congress designated 1,296,500 acres of this vast park as the Marjorie Stoneman Douglas Wilderness to honor this conservation pioneer who brought the beauty and fragility of the Everglades to public attention in her 1947 book *The Everglades, River of Grass*.

Located at the interface of temperate and subtropical environments, the park has a great diversity of resources. These include more than 400 species of birds, 800 species of land and water vertebrates, 1,600 species of vascular plants, 125 species of fish, and 24 varieties of orchids and over 220 significant archeological and historic sites. The park is home to more than 20 federally-listed species and 70 state-listed species. Because of its rich diversity and unique landscape, more than one million visitors come to experience the park each year. Popular activities include canoeing, kayaking, camping, boating, wildlife observation, and fishing.

Visitors access information about the park via four main contact stations – the Ernest Coe Visitor Center in Homestead, the Flamingo Visitor Center, the Shark Valley Visitor Center, and the Gulf Coast Visitor Center in Everglades City.

## 1.2 Laws, Regulations, and Policies

Numerous laws, regulations, and policies at the federal, state, and local levels guide the decisions and actions regarding the project. Some of the primary examples of these legal and regulatory constraints and bounds follow.

### ***National Park Service***

#### National Park Service Organic Act (1916) and Management Policies

In the National Park Service *Organic Act of 1916* (Organic Act), Congress directed the U.S. Department of the Interior and the NPS to manage parks “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as would leave them unimpaired for the enjoyment of future generations” (16 USC §1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that would ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC §1 a-1).

Despite these mandates, the Organic Act and its amendments afford the NPS latitude when making resource decisions that balance visitor recreation and resource preservation. By these acts, Congress “empowered [the NPS] with the authority to determine what uses of park resources are proper and what proportion of the park resources are available for each use” (*Bicycle Trails Council of Marin v. Babbitt*, 82 F.3d 1445, 1453 [9th Cir. 1996]).

Yet courts consistently interpreted the Organic Act and its amendments to elevate resource conservation above visitor recreation. *Michigan United Conservation Clubs v. Lujan*, 949 F.2d 202, 206 (6th Cir. 1991) states, “Congress placed specific emphasis on conservation.” The court in *National Rifle Ass’n of America v. Potter*, says “in the Organic Act Congress speaks of but a single purpose, namely, conservation.” The NPS *Management Policies 2006* also recognize that resource conservation takes precedence over visitor recreation. The policy dictates that “when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant” (NPS *Management Policies 2006*, 1.4.3).

Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. Yet the NPS has discretion to allow negative impacts when necessary (NPS *Management Policies 2006*, sec. 1.4.3). While some actions and activities cause impacts, the National Park Service cannot allow an adverse impact that constitutes resource impairment (NPS *Management Policies 2006*, sec. 1.4.3). The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the action (16 U.S.C. 1a-1). An action constitutes an impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS *Management Policies 2006*, sec. 1.4.5). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS *Management Policies 2006*, sec. 1.4.5).

Because the purposes for establishing national park units vary based on their enabling legislation, natural resources, cultural resources, and missions, management activities appropriate for each unit and for areas in each unit vary as well. An action appropriate in one unit would impair resources in another unit. Thus, the EA would analyze the context, duration, and intensity of impacts related to the Cape Sable Canals Dam Restoration Project of Everglades National Park, as well as the potential for resource impairment, as required by

*Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making.*

#### Management Policies

NPS *Management Policies 2006* establishes service-wide policies for the preservation, management, and use of park resources and facilities. These policies provide guidelines and direction for management of resources within the park. The alternatives considered in the EA would incorporate and comply with the provisions of these mandates and policies.

#### Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision-Making

Director's Order #12 and the accompanying handbook (NPS, 2006a) lay the groundwork for how the NPS complies with NEPA. Director's Order #12 and the handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects.

Director's Order #12 requires that impacts to park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision-makers to understand implications of those impacts in the short and long-term, cumulatively, and in context, based on an understanding and interpretation by resource professionals and specialists. Director's Order #12 also requires that an analysis of impairment to park resources and values be part of the NEPA document.

#### Director's Order #28: Cultural Resource Management (1998)

This Director's Order sets forth the guidelines for management of cultural resources, including cultural landscapes, archaeological resources, historic and prehistoric structures, museum objects, and ethnographic resources. This order calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principles contained in the NPS *Management Policies 2006*.

#### Director's Order #77: Natural Resource Protection

Director's Order #77 addresses Natural Resource Protection, with specific guidance provided in Reference Manual #77: Natural Resource Management. This Director's Order includes Director's Order #77-1: Wetland Protection and Director's Order #77-2: Floodplain Management, both of which would be considered since the proposed project is located within wetland resources and a designated floodplain.

Director's Order #77-1, reissued in 2002, establishes policies, requirements, and standards for implementing Executive Order 11990: Protection of Wetlands. Under this order, the NPS adopts a goal of "no net loss of wetlands." In addition, the NPS would strive to achieve a long-term goal of net gain of wetlands Service-wide. For proposed new development or other new activities, plans, or programs that are either located in or otherwise have the potential for direct or indirect adverse impacts on wetlands, the NPS would employ a sequence of: avoiding adverse wetland impacts to the extent practicable, minimizing impacts that would not be avoided, and compensating for remaining unavoidable adverse wetland impacts by restoring degraded wetlands. If the preferred alternative would result in adverse impacts to wetlands, the NPS would prepare and approve a Statement of Findings (SOF) in accordance with procedures described in Procedural Manual 77-1: Wetland Protection. Since wetland resources are located within the study area and would be affected by the proposed project, a SOF has been prepared in accordance with procedures described in Procedural Manual #77-1.

Director's Order #77-2, approved in 2003, applies to all NPS proposed actions, including the direct and indirect support of floodplain development that would adversely affect the natural resources and functions of floodplains, including coastal floodplains, or increase flood risks. This Director's Order also applies to existing actions when they are the subjects of regularly occurring updates of NPS planning documents. Under Director's Order #77-2, it is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. In managing floodplains on park lands, the NPS would (1) manage for the preservation of floodplain values; (2) minimize potentially hazardous conditions associated with flooding; and (3) comply with the NPS Organic Act and all other federal laws and Executive Orders related to the management of activities in flood-prone areas, including Executive Order 11988 (Floodplain Management), NEPA, applicable provisions of the Clean Water Act, and the Rivers and Harbors Appropriation Act of 1899. Specifically, the NPS would protect and preserve the natural resources and functions of floodplains; avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains; and avoid direct and indirect support of floodplain development and actions that would adversely affect the natural resources and functions of floodplains or increase flood risks. When it is not practicable to locate or relocate development or inappropriate human activities to a site outside and not affecting the floodplain, the NPS would prepare and approve a SOF, in accordance with procedures described in Procedural Manual #77-2: Floodplain Management, and take all reasonable actions to minimize the impact to the natural resources of floodplains.

#### ***Other Federal Laws and Executive Orders***

The NPS is also required to comply with the following laws, Executive Orders, regulations, and policies in developing this project.

##### National Environmental Policy Act, 1969, as Amended

Section 102(2)(c) of this act requires that an environmental analysis be prepared for proposed federal actions that may significantly affect the quality of the human environment or are major or controversial federal actions. NEPA is implemented through regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500-1508). The NPS has, in turn, adopted procedures to comply with the act and the CEQ regulations, as found in *Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making*, and its accompanying handbook (NPS 2001a). Section 102(2)(c) of this act requires that an EIS be prepared for proposed major federal actions that may significantly affect the quality of the human environment.

##### National Parks Omnibus Management Act of 1998

This act (16 USC 5901, et seq.) underscores NEPA in that both are fundamental to NPS park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available and provide options for resource impact analysis in this case.

##### Redwood National Park Act of 1978, as Amended

All National Park System units are to be managed and protected as parks, whether established as a recreation area, historic site, or any other designation. This act states that the National Park Service must conduct its actions in a manner that would ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall directly and specifically provided by Congress."

### Endangered Species Act of 1973, as Amended

This act requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals with the potential to impact federally endangered or threatened plants and animals. It also requires federal agencies to use their authorities in furtherance of the purposes of the Endangered Species Act by carrying out programs for the conservation of endangered and threatened species and to ensure that any agency action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat.

### National Historic Preservation Act of 1966, as Amended

Section 106 of this act requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places. All actions affecting the parks' cultural resources must comply with this legislation.

### Antiquities Act of 1906

It protects all historic and prehistoric sites on Federal lands and prohibits excavation or destruction of such antiquities unless a permit (Antiquities Permit) is obtained from the Secretary of the department which has the jurisdiction over those lands. It also authorizes the President to declare areas of public lands as National Monuments and to reserve or accept private lands for that purpose.

### Archaeological Resources Protection Act of 1979

Requires Federal agencies to provide notice to the Secretary of the Interior of any dam constructions and, if archeological resources are found, for recovery or salvage of them. The law applies to any agency whenever it received information that a direct or federally assisted activity would cause irreparable harm to prehistoric, historic, or archaeological data. Increases the penalty for stealing or vandalizing to \$500,000 and up to five years in prison.

### Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)

This act assigns ownership and control of Native American cultural items, human remains, and associated funerary objects to Native Americans. It also establishes requirements for the treatment of Native American human remains and sacred or cultural objects found on Federal land. This act further provides for the protection, inventory, and repatriation of Native American cultural items, human remains, and associated funerary objects. Requires museums that receive public funds to consult with Native Americans. Native Americans have the power to decide what happens to museum collections of human remains, grave goods, and sacred items. When these items are inadvertently discovered, cease activity, make a reasonable effort to protect the items, and notify the appropriate Indian tribe(s) and/or Native Hawaiian organization(s).

### American Indian Religious Freedom Act of 1978 (AIRFA)

AIRFA affirms the right of Native Americans to have access to their sacred places. If a place of religious importance to American Indians may be affected by an undertaking, AIRFA promotes consultation with Indian religious practitioners, which may be coordinated with Section 106 consultation. Amendments to Section 101 of NHPA in 1992 strengthened the interface between AIRFA and NHPA by clarifying that:

Properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the National Register.

In carrying out its responsibilities under Section 106, a Federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to properties described in subparagraph (A). [16 U.S.C. 470a (a)(6)(A) and (B)].

#### The Secretary of the Interior's Standards for the Treatment of Historic Properties, 1995

##### Standards for Preservation

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

#### Clean Water Act

The Federal Pollution Control and Prevention Act of 1972, commonly known as the Clean Water Act, is the primary federal law in the United States governing water pollution. The purpose of the act is to make our nation's waters "fishable and swimmable" by 1983 by eliminating releases of toxic substances, controlling wastewater and storm water pollution of waterways, and instituting water quality standards and associated permitting systems.

The principal body of law currently in effect is based on the Federal Water Pollution Control Amendments of 1972, which substantially expanded and strengthened earlier legislation. Major amendments were made to the Clean Water Act of 1977 enacted by the 95th United States Congress and the Water Quality Act of 1987 enacted by the 100th United States Congress.

#### Coastal Zone Management Act, 1966

The Coastal Zone Management Act (CZMA) (16 U.S.C. §§1451 et. seq.) seeks to preserve and protect coastal resources. Through the CZMA, states are encouraged to develop coastal zone management programs (CZMPs) to allow economic growth that is compatible with the protection of natural resources, the reduction of coastal hazards, the improvement of water quality, and sensible coastal development. The CZMA provides financial and technical incentives for coastal states to manage their coastal zones in a manner consistent with CZMA standards and goals. CZMA Section 307 requires that federal agency activities that affect any land or water use or natural resource of the coastal zone must be consistent to the maximum

extent practicable with the enforceable policies of the state CZMP. Federal agencies and applicants for federal approvals must consult with state CZMPs and must provide the CZMP with a determination or certification that the activity is consistent with the CZMP's enforceable policies, where those policies would have a possible effect on state coastal resources, as defined by the CZMP and local land use plans.

The Florida Coastal Management Program (FCMP), the State of Florida's federally approved management program, was approved by the National Oceanic and Atmospheric Administration in 1981. The FCMP consists of a network of 23 Florida Statutes administered by 11 state agencies and four of the five water management districts designed to ensure the wise use and protection of the state's water, cultural, historic, and biological resources; to minimize the state's vulnerability to coastal hazards; to ensure compliance with the state's growth management laws; to protect the state's transportation system; and to protect the state's proprietary interest as the owner of sovereign submerged lands.

The State of Florida's coastal zone includes the area encompassed by the state's 67 counties and its territorial seas. Therefore, federal actions occurring throughout the state are reviewed by the state for consistency with the FCMP. However, the state has limited its federal consistency review of federally licensed and permitted activities to the federal licenses or permits specified in Section 380.23(3)c, Florida Statutes.

#### Magnuson-Stevens Fishery Conservation and Management Act, as amended

The *Sustainable Fisheries Act of 1996* (Public Law 104-267) requires all federal agencies to consult with National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat. Essential fish habitat is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." "Waters" include aquatic areas and their associated physical, chemical and biological properties. "Substrate" includes sediment underlying the waters. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle. The National Marine Fisheries Service would provide recommendations on conserving essential fish habitat to federal or state agencies for activities that would adversely affect essential fish habitat.

#### Executive Order 11988 - Floodplain Management

This Executive Order directs federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

#### Executive Order 11990 - Protection of Wetlands

This Executive Order directs federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

#### Executive Order 13112 – Invasive Species

This Executive Order requires federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species may cause.

## **State Laws**

### **Outstanding Florida Waters**

All waters that are a part of Everglades National Park are defined as Outstanding Florida Waters (OFW). Section 403.061 (27), Florida Statutes, grants the Florida Department of Environmental Protection power to: Establish rules that provide for a special category of water bodies within the state, to be referred as “Outstanding Florida Waters,” which shall be worthy of special protection because of their natural attributes. In general, the Florida Department of Environmental Protection cannot issue permits for direct pollutant discharges to OFWs that would lower ambient (existing) water quality or indirect discharges that would significantly degrade the waters. Permits for new dredging and filling must be clearly in the public interest, taking into consideration whether the:

- activity would adversely affect the public health, safety, or welfare or property of others;
- activity would adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
- activity would adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
- activity would adversely affect the fishing or recreational values or marine productivity in the vicinity of the activity;
- activity would be of a temporary or permanent nature;
- activity would adversely affect or enhance significant historical and archaeological resources under the provisions of Sec. 267.061 F.S.; and
- current condition and relative value of functions being performed by areas affected by the proposed activity (373.414(1)(a), F.S.).

## **1.3 Project Background**

### **1.3.1 History of Cape Sable Canals**

The Homestead and East Cape Sable canals are among several canals that were constructed in the Cape Sable area between 1900 and the 1930's, prior to the establishment of Everglades National Park. The purpose of these canals was to provide access for development by draining water from the interior of Cape Sable and making the area useful for transportation, agriculture and commerce.

The Homestead canal was constructed between 1915 and 1922 in conjunction with the first highway to penetrate the Everglades, Ingraham Highway, to provide drainage and fill for the road. The canal, which was originally approximately 50 miles long with variable width and depth, followed the route of the old highway until it reached Coot Bay/Mud Lake and then turned westward to Lake Ingraham. Portions of the original canal and old highway have since been removed. The Homestead canal was eventually extended all the way to Cape Sable, which resulted in the construction of several shorter canals, including the East Cape canal. Completed in 1922, the East Cape canal was part of the network of canals built to drain Cape Sable for future development. The canal runs south from the Homestead canal to the Florida Bay, and although its width and depth vary, it is approximately 2.5 miles long. Near its midpoint, Ingraham canal branches off to the northwest for approximately one mile to Lake Ingraham. The portion of the East Cape canal continuing north from this branch to the Homestead canal is also known as

the East Cape Extension canal. The portion of the East Cape canal continuing south from this branch to Florida Bay is also known as the Lower East Cape canal.

Since the completion of the canals, natural forces such as tides and runoff have continually widened the canals and exposed Lake Ingraham to tidal flows resulting in a change in the ecosystem of the Cape Sable region. The smaller interior Homestead and East Cape Extension canals were plugged with earthen dams in the late 1950's or early 1960's to minimize saltwater intrusion into the formerly freshwater interior marshes behind the marl ridge. However, these dams failed during the late 1980's or early 1990's and were replaced by 20-foot-long sheet-piling dams in 1997 (Technical Information Center 2004). The sheet-pile plugs failed after a few years, possibly due in part to vandalism, which increased erosion of the canal banks. Openings at the failed plugs continue to widen due to erosional processes and transport marine waters eastward along the Homestead Canal as far as Bear Lake. Tidal flushing has also widened several canals, including the Middle Cape, East Cape and Lake Ingraham canals, approximately two to four feet per year and deposited sediment in Lake Ingraham converting it into a mud flat at low tide (Wanless and Vlaswinkel, 2005)

### **1.3.2 Factors Influencing the Cape Sable System**

#### **1.3.2.1 Climate Change – Sea Level Rise**

Cape Sable evolved following a rapid rise in sea level 2,500 to 2,400 years ago (Wanless and Vlaswinkel, 2005). The rate of relative sea level rise was only three to five centimeters (cm) per century up until the beginning of last century. The relative sea level rise since 1930 has increased six-fold due to regional changes in the density and circulation of North Atlantic shallow and deep waters. The 9-inch rise in sea level since 1930 has destabilized all of Cape Sable's coastal and wetland environments, greatly increasing the area and volume of water that incoming tides cover (Wanless and Vlaswinkel, 2005).

The *Second Report and Initial Recommendations* published by the Miami-Dade County Climate Change Advisory Task Force (CCATF), based on published recommendations from the Intergovernmental Panel on Climate Change (IPCC), states that global warming will result in many changes to the natural environment, "including changing atmospheric circulation and temperature patterns, changes in rainfall and severe weather, changes in biologic community distribution, increased extinction rates, changes in disease and pest distribution, and changes in sea level" (CCATF 2008). While all these environmental impacts will affect South Florida and Everglades National Park within the next century, the key concern for the lowlying Cape Sable area will be rising sea level, "with a very high likelihood" that the sea level will rise an additional 1.5 feet in the next 50 years and a cumulative total of three to five feet within a century (CCATF 2008).

#### **1.3.2.2 Weather**

"Four major hurricanes crossed the Mangrove Coast between Cape Sable and Everglades City during the past century (1926, 1935, 1960 and 1992). The Category 5 and 4 storms of 1935 and 1960 [Hurricane Donna] passed directly across Cape Sable and devastated the tall mangrove forests, both at the coast and in the interior. Rapid post-storm peat decay and substrate subsidence, combined with rapidly rising sea level, has made recovery difficult, and portions of these wetland mangrove forests have evolved to open water" (Wanless and Vlaswinkel, 2005). More recently, the Cape Sable area experienced storm surge and rain effects from Hurricanes Katrina and Wilma in 2005 (e.g., 19.87 inches during Katrina). It is also important to note that in

addition to the impacts from hurricanes, stronger winter storm events have had an impact on the composition of the Cape Sable area (Wanless and Vlaswinkel, 2005).

### **1.3.2.3 Human Effects**

Human modifications mostly occurred prior to 1935 and included a road that extended from Flamingo along the marl ridge to northern Lake Ingraham. The construction of a number of narrow drainage canals had considerable influence over the environmental dynamics of southern Cape Sable.

### **1.3.3 Previous Studies and Project Planning**

Two recent studies have been conducted for the Cape Sable area of Everglades National Park, both of which are complete. In June 2005, Wanless and Vlaswinkel at the University of Miami conducted a study of *Coastal Landscape and Channel Evolution Affecting Critical Habitats at Cape Sable, Everglades National Park, Florida*, funded by the NPS. The study documented “significant landscape changes” to Cape Sable “as a result of saline intrusion, wetland collapse, enlarged tidal prism, rapid sedimentation, and shore and interior erosion” (Wanless and Vlaswinkel 2005). In 2007, URS Corporation was contracted by the NPS to conduct a Preliminary Engineering Analysis to identify and develop preliminary engineering design concepts for the restoration of the failed dams on the East Cape Extension and Homestead canals. URS engineered six alternative solutions for dam restoration and analyzed each alternative using a matrix rating direct impacts, indirect impacts, constructability, dredging, cost, stability, and safety (URS 2007).

## **1.4 Scoping Process and Public Participation**

### **1.4.1 Scoping**

Public scoping is an early and open process to solicit public and internal concerns relating to a proposed action. The Council on Environmental Quality (CEQ 1978) guidelines for implementing NEPA, and the NPS NEPA guidelines contained in *Director’s Order # 12: Conservation Planning, Environmental Impact Analysis and Decision Making Handbook* (NPS 2001a), require that the NPS “make a ‘diligent’ effort to involve the interested and affected public (1506.6(2)) on a proposal for which an EA is prepared” (NPS 2001a). During the development of the EA, the park actively involved the public in the process. The park’s goals for public participation included: understanding of the project by the public; substantive and valuable input to guide park decisions; and minimization of conflicts through dissemination of information and starting discussion.

The park elicited public participation in the discussion of issues, area to be studied, and potential alternatives. A public scoping meeting was held on October 8, 2008, at the South Dade Regional Library in Miami, Florida. The structure of the meeting allowed individuals interested in participating in the planning process to be directly involved. Chapter 4 – Consultation and Coordination – provides additional details about these meetings and the subsequent public comment received. Public comments were used to help formulate the alternatives and identify the issues and impact topics considered in this document.

### **1.4.2 Derivation of Issues and Impact Topics**

Issues describe problems or concerns associated with current impacts from environmental conditions as well as problems that may arise from the potential future management of the Cape Sable dams. The development of issue statements often sheds light on previously unrealized management opportunities that, if enacted, would bring about a greater beneficial change.

Issues and concerns related to the restoration of the Cape Sable dams were identified by the park staff with input from the public, partners, and tribal organizations. Issues are then grouped into areas of similar concerns, which would then be addressed as impact topics in the EA. These impact topics were identified based on the following: issues raised during scoping, federal laws, regulations, executive orders, NPS *Management Policies 2006*, and NPS knowledge of limited or easily impacted resources.

#### **1.4.3 Impact Topics Analyzed in this Environmental Assessment**

The following impact topics are discussed and analyzed in Chapter 3 – Affected Environment and Environmental Consequences. These topics are resources of concern that would be beneficially or adversely affected by the actions proposed under each alternative and are developed to ensure that the alternatives are evaluated and compared based on the most relevant topics. A brief rationale for the selection of each impact topic is given as an issue statement. For those topics that were dismissed from further consideration, an explanation is provided later in this chapter.

##### **1.4.3.1 Geology, Topography and Soils**

Substantial erosion of soils has occurred around the edges of the existing failed sheetpile dams at the East Cape Extension and Homestead canals potentially due to strong current, motorized boat wake, and vandalism. Restoration of the existing dams would serve to eliminate or reduce erosion along the banks of the canals. Temporary impacts to the soils from construction activities, including dredging, should also be considered.

*Issue Statement: Restoration of the failed dams in the East Cape Extension and Homestead canals in Cape Sable would eliminate or minimize canal bank erosion, thus protecting the geologic resources at the dam sites and throughout the entire length of each canal since the rate of canal widening is expected to decrease when flow velocity is reduced. Temporary disturbance from construction activities such as the placement of sheetpile, fill, or Geotubes, and dredging activities would temporarily alter geologic resources in the project area.*

##### **1.4.3.2 Water Resources**

###### **1.4.3.2.1 Hydrology**

Restoration of the failed dams at the East Cape Extension and Homestead canals would impact the hydrology of the Cape Sable system. The flow of water through the East Cape Extension and Homestead canals would be permanently blocked except for times when tidal flow overtops the marl ridge. The flow of water in the East Cape Extension canal has the potential to increase flow through Eastside Creek.

*Issue Statement: Restoration of the failed dams in the East Cape Extension and Homestead canals in Cape Sable would impact the hydrology of the Cape Sable system. The flow of water through other nearby waterways would continue and may increase.*

###### **1.4.3.2.2 Water Quality**

Waters in the park are designated Outstanding Florida Waters; therefore, no degradation of surface water quality is permitted. Currently, the water quality of the interior freshwater and brackish marshes of Cape Sable is being degraded by tidal saltwater intrusion and loss of freshwater. Restoration of the existing failed dams would reduce the saltwater intrusion and increase the retention of freshwater from wet season rains in the interior freshwater and brackish marshes. Potential concerns for water quality also include short-term temporary

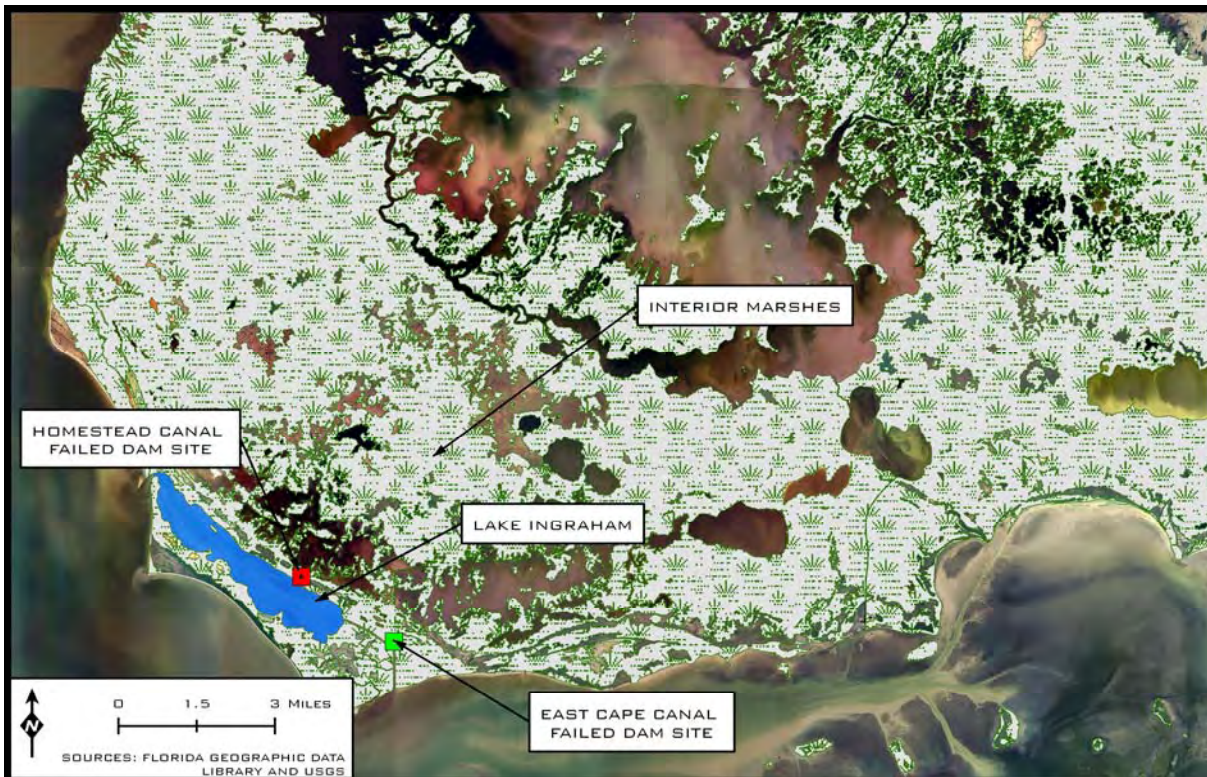
increased turbidity from dredging and construction activities, as well as potential minor impacts from oil or gas release from construction equipment.

*Issue Statement: Restoration of the existing failed dams at Cape Sable would reduce saltwater intrusion and increase freshwater retention in the interior freshwater and brackish marshes of Cape Sable, beneficially affecting water quality in the area. However, construction at the failed dam sites has the potential to cause short-term temporary negative impacts to water quality from dredging and other construction-related activities.*

#### **1.4.3.2.3 Vegetation and Wetlands**

The majority of the land around the project area is classified as wetland habitat, an integral component of the Everglades National Park landscape. As much of the Cape Sable area consists of wetlands, any construction outside the existing footprint of the dams has the potential to impact wetlands (see Figure 1.6 – Expanded Study Area Wetlands Map). The quality of the interior freshwater and brackish wetlands is currently being degraded by tidal saltwater intrusion and loss of freshwater caused by the existing failed dam structures. The restoration of the Cape Sable dams would result in beneficial effects to the wetlands through the decrease in saltwater intrusion and increase in freshwater retention. Potential construction-related impacts to wetlands include mangrove trimming required to transport construction equipment and materials to the project sites; increased turbidity; and introduction of exotic plant species resulting from the addition of fill material.

*Issue Statement: Restoration of the failed dams at the East Cape Extension and Homestead canals has the potential for construction-related negative impacts to wetlands. The potential for beneficial impacts also exists in the form of increased wetland quality in the interior freshwater and brackish marshes of Cape Sable from decreased saltwater intrusion and increased freshwater retention.*



**Figure 1.6 – Expanded Study Area Wetlands Map**

#### **1.4.3.3 Wildlife and Habitat**

The Cape Sable area provides important habitat for a number of species. This habitat is home to many protected species, as well as shrimp and fish. The mangroves provide feeding and nesting habitat for wading birds. The terrestrial habitats and vegetation at the project area support many wildlife species. Restoration of the failed Cape Sable dams would cause both positive and negative impacts to the wildlife in the Cape Sable area. By restoring the failed Cape Sable dams, thereby decreasing saltwater intrusion and increasing freshwater retention in the interior freshwater and brackish marshes of Cape Sable, juvenile crocodile habitat, wading bird foraging habitat, and fish habitat would all be improved. Potential negative impacts to wildlife habitat would be caused by construction-related activities such as dredging, the placement of fill material, soil disturbance, and mangrove trimming. Short-term and temporary noise and vibration impacts from construction would also occur.

*Issue Statement: The Cape Sable area of Everglades National Park contains important habitat for a number of species. Restoring the failed Cape Sable dams has the potential to impact these species through habitat modification and/or loss and increased levels of disturbance. In addition, beneficial affects may occur from a decrease in disturbance from motorized boaters and decreased saltwater intrusion, resulting in improved wildlife habitat.*

#### **1.4.3.4 Marine Resources and Essential Fish Habitat**

The marine and estuarine resources of the Cape Sable area include important park elements such as submerged aquatic vegetation (seagrass communities), mangroves, wading birds, crocodiles, manatees, and wetlands. These elements collectively form a valuable entity to be considered in the assessment of alternatives for the Cape Sable dams' restoration. Restoration of the failed Cape Sable dams would improve protection for marine resources by decreasing saltwater intrusion and increasing freshwater retention in the interior freshwater and brackish marshes. Potential negative impacts to marine resources would be caused by construction-related activities such as dredging, the placement of fill material, and increased turbidity. Fish stocks would also be partially isolated by the restored dams, though other natural creek connections to the greater Cape Sable system exist.

Essential Fish Habitat (EFH), habitat essential to the long-term survival and health of our nation's fisheries, exists in the Cape Sable area of Everglades National Park. EFH is highly dependent upon variables such as temperature, nutrients, and salinity. Restoration of the failed dams at the East Cape Extension and Homestead canals would decrease saltwater intrusion and increase freshwater retention in the interior marshes of Cape Sable, which are designated as EFH, thus improving the quality of the EFH. Potential negative impacts to EFH would occur from construction-related activities in the form of increased turbidity, dredging, and the placement of fill material. Connectivity would also be partially blocked by the restoration of the dams, though other natural creek connections to the greater Cape Sable system exist.

*Issue Statement: The Cape Sable area of Everglades National Park contains important marine resources such as submerged aquatic vegetation (seagrass communities), hard bottoms, mangroves, and wetlands most of which would be categorized as Essential Fish Habitat. Restoring the failed Cape Sable dams has the potential to benefit these resources through decreased saltwater intrusion and increased freshwater retention in the interior marshes of Cape Sable. The potential for construction-related negative impacts also exists, including partial isolation of fish populations.*

#### **1.4.3.5 Special Status Species**

Everglades National Park, including the Cape Sable area, is a unique ecosystem that is home to numerous federal- and state-listed threatened and endangered species. Restoration of the failed Cape Sable dams would cause both positive and negative impacts to the special status species in the Cape Sable area. By restoring the failed Cape Sable dams, thereby decreasing saltwater intrusion and increasing freshwater retention in the interior freshwater and brackish marshes of Cape Sable, juvenile crocodile habitat, wading bird foraging habitat, and fish habitat would all be improved. Potential negative impacts would be caused by construction-related activities. Both the East Cape Extension and Homestead canal banks have historically been sites of increasing crocodile nesting. The location of nests and nesting season would be considered in the assessment of alternatives and construction schedules. Other negative effects potentially include impacts to the smalltooth sawfish from dredging activities and impacts to protected sea turtles from increased turbidity during construction.

##### **1.4.3.5.1 Federally Listed Species**

Federally-listed endangered animals that have the potential to utilize the habitat resources of the Cape Sable study area include smalltooth sawfish (*Pristis pectinata*), Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), green sea turtle (*Chelonia mydas*), Atlantic Ridley sea turtle (*Lepidochelys kempi*), Atlantic leatherback sea turtle (*Dermochelys coriacea*), wood stork (*Mycteria americana*), West Indian manatee (*Trichechus manatus latirostris*), and Florida panther (*Felis concolor coryi*). Federally-listed threatened animals that have the potential to utilize the habitat resources of the Cape Sable study area include loggerhead turtle (*Caretta caretta*), American crocodile (*Crocodylus acutus*), and eastern indigo snake (*Drymarchon corais couperi*). The Florida population of the American crocodile was down-listed from endangered to threatened on March 20, 2007 due to improvements in the species' status. It remains listed as endangered throughout the rest of its range. The bald eagle was removed from the list of threatened and endangered species on June 28, 2007. No known federally listed plant species occur within the Cape Sable study area. Chapter 3 provides a detailed listing of federally listed species that have the potential to occur in the Cape Sable study area.

##### **1.4.3.5.2 State Listed Species**

Protected state-listed plants and wildlife that have the potential to utilize the habitat resources of the Cape Sable study area include osprey (*Pandion haliaetus*), white crowned pigeon (*Columba leucocephala*), roseate spoonbill (*Ajaia ajaja*), Florida mayten (*Maytenus phyllanthoides*) and white fenrose (*Kosteletzkya depressa*). Chapter 3 describes the state-listed species of special concern with the potential to occur in the Cape Sable study area.

*Issue Statement: The Cape Sable area of Everglades National Park contains federally protected animal species as well as numerous state-listed plant and animal species. Restoring the failed Cape Sable dams has the potential to impact these species through habitat modification and/or loss and increased levels of disturbance. In addition, beneficial effects may occur in the form of improved wildlife habitat.*

#### **1.4.3.6 Wilderness**

Everglades National Park is the largest designated wilderness area east of the Rocky Mountains (1,296,000 acres). The Cape Sable area includes both submerged and terrestrial wilderness. The offshore submerged area includes the bottom of all marine areas below high tide, including Florida Bay. As a result of this designation, as well as prohibitions against damaging natural features provided for in the Code of Federal Regulations, boats are prohibited from damaging resources in this area. Many visitors experience the vast wilderness of Cape Sable via the East Cape Extension and Homestead canals, so maintaining and enhancing the

park's wilderness values is critical to meeting park goals for protecting its wilderness resources and offering high-quality wilderness experiences. The wilderness area beyond the existing failed dams is currently being degraded by saltwater intrusion and illegal trespassing by motorized boaters. Restoration of the failed dams would beneficially affect the wilderness area beyond the existing failed dams by decreasing saltwater intrusion and blocking illegal motorized boat access. The wilderness areas adjacent to the existing failed dams would be negatively impacted by construction noise and disturbance, through these impacts should be short-term and temporary.

*Issue Statement: Restoration of the failed dams at the East Cape Extension and Homestead canals would beneficially affect the wilderness areas adjacent to the dams. Temporary negative impacts would also occur to wilderness areas, including submerged wilderness, from construction-related activities.*

#### **1.4.3.7 Cultural Resources**

##### **1.4.3.7.1 Historic Resources**

Although they are no longer functioning to drain and develop the Everglades, the East Cape Extension and Homestead canals in Cape Sable were determined, in consultation with the State Historic Preservation Officer (SHPO), to be eligible for listing in the National Register of Historic Places as historic structures significant in the development of South Florida. It is important to note that the two failed dams were constructed as replacements in the 1990s and are not considered features contributing to the National Register eligibility of the canals. The NPS would coordinate with the SHPO to avoid or mitigate long-term adverse impacts to these structures as a result of construction activities related to dam restoration. Prior to construction, archaeological surveys would be completed of all areas of proposed ground disturbance to ensure that significant archaeological resources (if identified within the areas of potential effect) are avoided and protected from construction activities. If avoidance is not feasible, appropriate data recovery or other mitigation measures would be carried out by the NPS in consultation with the SHPO and affiliated tribal preservation offices.

*Issue Statement: Minor to moderate adverse impacts to the East Cape and Homestead canals, which are eligible historic structures, would be minimized through project design or mitigation measures. Long-term beneficial effects would result from slowing the widening of the canals from the current erosional processes.*

#### **1.4.3.8 Visitor Use and Experience / Public Safety**

The Cape Sable area experiences high visitor use within the Everglades National Park. Overall visitation in the park has increased in the past 10 years, with a general upward trend increasing from 989,532 visitors in 1995 to 1,074,764 in 2007. Visitors use the Cape Sable area for fishing, canoeing/kayaking, motorized boating, camping and exploration (i.e., hiking and birding). Current conditions at the failed dam sites pose a safety hazard to boaters. The visitor experience is also degraded by the presence of illegal motorized boaters trespassing into the interior marshes of Cape Sable beyond the failed dams. Visitor experience and safety would be improved by the restoration of the failed dams by the inclusion of features such as a canoe/kayak portage over the restored structures, motorized vessel moorings on the seaward side of the dams, and the prevention of illegal motorized boaters entering the interior marshes of Cape Sable. Short-term negative impacts would occur during construction from closing the construction area to visitors and increased noise in the general area.

*Issue Statement: Visitor experience and safety at Cape Sable has been negatively impacted by the failed dams. Restoration of the dams would improve visitor experience and safety in the area. Short-term impacts to visitor use and experience would occur during construction.*

#### **1.4.3.9 Park Management and Operations**

The failed dams at the East Cape Extension and Homestead canals currently require some maintenance and monitoring from NPS personnel. Restoration of the dams would maintain or reduce the current levels of maintenance, monitoring, and enforcement required at the dam sites. Park management and operations should not be negatively impacted by restoration of the dams, though a short-term time demand on park personnel may be required during the actual construction activities.

*Issue Statement: Restoration of the failed dams at Cape Sable would maintain or reduce the current maintenance, monitoring, and enforcement labor needs required at the dam sites, though park personnel may be needed for oversight during construction activities.*

#### **1.4.4 Impact Topics Dismissed from Further Analysis**

The following impact topics were dismissed from further consideration. The rationale for dismissal is provided below.

- **Air Quality:** Everglades National Park is a designated Class I air quality area under the Clean Air Act. Lands with this designation are subject to the most stringent air quality regulations. Very limited increases in pollution are permitted in the vicinity. The air quality of the area is a valuable park resource, enhancing visitation by providing clean air and high visibility to match the unique ecosystem experience. The Clean Air Act of 1963 (42 USC 7401) requires federal land managers to protect air quality, and the NPS *Management Policies 2006* requires air quality to be analyzed when planning park projects and activities.

If the dams were to be restored, emissions generated from transport and construction equipment would be mitigated and would not measurably contribute negatively to air quality conditions or adversely affect visitors or staff. Because of the high water table, it is unlikely that large quantities of dust would be generated, and any occurrence of fugitive dust would be localized and very transient. If dust were generated during construction, best management practices for dust suppression would be initiated. Emissions from construction equipment would be kept to a minimum by restricting idling time.

Based on an analysis of fuel used for construction of the project, the level of greenhouse gas emissions produced would range from 98 - 374 metric tons of carbon equivalent (MTCE). As stated above, best management practices and mitigation measures would be used to minimize the project's carbon footprint and its contribution to global climate change. When compared to the level of greenhouse gas emissions produced in the nation (approximately 6 billion MTCE in 2007) and the region, the emissions resulting from this project would be negligible and would not substantially contribute to air quality impacts.

Implementation of any of the alternatives described in the plan would have negligible effects on air quality, and the class I air quality status of the park would be unaffected. Therefore, air quality was not analyzed in detail as a separate impact topic and was dismissed from detailed analysis in this EA.

- **Archaeological Resources:** No known archaeological resources exist in the study area of Cape Sable. The closest known resources are located in the vicinity of Bear and Mud Lakes (NPS 2009), outside of the study area. An Indian Shell Midden site (discovered in 2007) and remains of Ft. Poinsett are located on Cape Sable beach, which is also outside of the study area. If archaeological resources were discovered during construction, construction would be halted in the area of the discovery and the National Park Service would consult with the SHPO and affiliated tribes to assess the significance of the resources and to appropriately avoid, protect and/or mitigate adverse impacts to the resources.
- **Conflicts with Land Use Plans:** The actions included in this EA are compatible and not in conflict with local land use plans because the project seeks to restore environmental conditions and improve the quality of life and recreational access in the local area. Therefore, this topic was not analyzed in detail in this EA.
- **Cultural Landscapes:** According to the National Park Service's Director's Order 28: *Cultural Resource Management Guideline*, a cultural landscape is:
 

“a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by the physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.”

There are no designated cultural landscapes in the Cape Sable area of Everglades National Park. Therefore, there would be no impacts to cultural landscapes and this issue was not analyzed in detail as a separate topic in this EA.

- **Ecologically Critical Areas:** Everglades National Park does not contain any designated ecologically critical areas, wild and scenic rivers, or other unique natural resources, as referenced in 40 Code of Federal Regulations (CFR) 1508.27. Therefore, this issue was not analyzed in detail as a separate impact topic in the EA.
- **Energy Requirements and Conservation Potential:** There would be no permanent energy requirements from the restored dam structures. Energy requirements during construction would be negligible to minor, short-term, and temporary. Therefore, this issue was not analyzed in detail as a separate topic in this EA.
- **Environmental Justice:** Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Guidelines for implementing this executive order under NEPA are provided by the CEQ. According to the U.S. Environmental Protection Agency (USEPA) (1994), environmental justice is:

*The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal*

*programs and policies. The goal of this “fair treatment” is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.*

There are both minority and low-income populations in the general vicinity of Everglades National Park. However, based on the initial environmental screening process for the project, environmental justice is dismissed as an impact topic because:

- NPS staff actively solicited public participation as part of the planning process and gave equal consideration to input from all persons, regardless of age, race, income status, or other socioeconomic or demographic factors.
  - Impacts associated with implementation of each alternative including the Preferred Alternative, would not disproportionately affect any minority or low-income population or community.
  - Implementation of each alternative, including the Preferred Alternative, would not result in any identified effects specific to any minority or low-income community.
  - The NPS staff does not anticipate that any adverse impacts on public health and/or the socioeconomic environment would appreciably alter the physical and social structure of the nearby minority or low-income populations or communities.
- **Ethnographic Resources:** As defined by the NPS *Management Policies 2006*, ethnographic resources are the cultural and natural features of the park that are of traditional significance to traditionally associated peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with the park for two or more generations (40 years), and whose interests in the park’s resources began before the park’s establishment. Ethnographic resources can include sacred sites that have spiritual and religious significance to tribes and other traditionally associated groups, and may serve as the locations of ceremonial activities. The history of Everglades National Park includes settlement and the use of waters for fishing for both sustenance and profit by both Native Americans and early settlers to the area. The Miccosukee and Seminole tribes claim the Everglades as a homeland and traditional use area before the park’s establishment. Fishing for subsistence and profit has occurred at the park since the early 1900s and may be considered an ethnographic use. However, since the law prohibits commercial fishing, this ethnographic use has been terminated. Project actions would not interfere with any other ethnographic uses. Due to the location, minimal construction footprint of the project, and alternative access routes during construction, impacts from construction, if any, to ethnographic resources would be negligible. Therefore, this issue was not analyzed in detail as a separate impact topic in the EA.
  - **Floodplains:** *Director’s Order #77-2: Floodplain Management* states that this procedure does not apply to certain park functions in “isolated backcountry sites, natural or undeveloped sites along trails or roads, survey and study sites, or other similar activities” that are often located near water for the enjoyment of visitors but require little physical development and do not involve overnight occupation, such as the Cape Sable area. Thus in accordance with procedures described in *Procedural Manual #77-2: Floodplain Management*, this project meets the criteria under Section V.B. *Excepted Actions*.
  - **Indian Trust Assets:** Indian trust assets are owned by American Indians but held in trust by the United States. Requirements are included in the Secretary of the Interior’s Secretarial Order No. 3206, “American Indian Tribal Rites, Federal – Tribal Trust Responsibilities, and the Endangered Species Act,” and Secretarial Order No. 3175,

“Departmental Responsibilities for Indian Trust Resources.” According to park staff, Indian trust assets do not occur within Everglades National Park. There are no Indian trust resources downstream of the project area. Therefore, there would be no downstream effects on Indian trust resources from any of the proposed alternatives. Thus, this issue was not analyzed in detail as a separate topic in this EA.

- **Museum Collections:** There are no museum collections in the project area that would be affected by the implementation of the project. Therefore, this issue was not analyzed in detail as a separate topic in this EA.
- **Natural or Depletable Resource Requirements and Conservation Potential:** The NPS uses sustainable practices to minimize the short- and long-term environmental impacts of development and other activities through resource conservation, recycling, waste minimization, and the use of energy-efficient and ecologically responsible materials and techniques. Project actions would not compete with dominant park features or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity associated with wetlands. Therefore, this issue was not analyzed in detail as a separate topic in this EA.
- **Night Sky:** The Cape Sable area of Everglades National Park is located in a remote area of the park away from developed areas; therefore, the night sky is considered a resource. Since lighting is not a component of any of the action alternatives and construction activities are anticipated to occur only during daylight hours, no impacts to night sky would occur. Therefore, night sky was not analyzed in detail as a separate impact topic in this EA.
- **Prime or Unique Farmland:** Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique agricultural land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land is available for farming uses. Lands within the park are not available for farming and therefore do not meet the definitions. Therefore, this issue was not analyzed in detail as a separate impact topic in this EA.
- **Socioeconomic Environment:** The restoration of the failed Cape Sable dams is not anticipated to have an adverse or a beneficial effect on the local economy. Therefore, this issue was not analyzed in detail as a separate topic in this EA.
- **Soundscapes:** The soundscape of the Cape Sable area would be temporarily impacted by noise related to construction activities. Temporary noise impacts to wildlife and visitor use would be addressed under the corresponding impact topics in Chapter 3 of this document. No long-term impacts to soundscapes are anticipated as a result of this project. Therefore, this issue was not analyzed in detail as a separate topic in this EA.
- **Transportation:** Access to all park roads would not be impacted by any of the proposed action alternatives since construction staging areas will be located outside of the Park. The exact location of the staging area will be the responsibility of the selected contractor. Therefore, this issue was not analyzed in detail as a separate topic in this EA. However, traffic impacts are assumed to be minor since the volume of construction equipment and materials will be limited to the capacity of the shallow draft transportation barge needed to access both work zones. Therefore, transportation of materials and equipment to the upland staging area can be phased to prevent adverse traffic congestion.

- **Urban Quality and Gateway Communities:** Although Homestead, Florida City, and the Redland area of South Miami-Dade County are located adjacent to the park and provide food and lodging for a number of park visitors, these communities are not officially designated gateway communities for the park and would not be impacted by the proposed action alternatives. Therefore, this issue was not analyzed in detail as a separate topic in this EA.

#### **1.4.5 Relationship to Other Plans, Policies and Actions**

##### ***1.4.5.1 National Park Service Plans, Policies and Actions***

National Park Service plans, policies, and actions beyond those listed previously that may influence the restoration of the Cape Sable dunes are provided below:

##### ***Everglades National Park***

###### Everglades National Park General Management Plan/East Everglades Wilderness Study

Everglades National Park is in the process of developing the Draft General Management Plan/East Everglades Wilderness Study/ Environmental Impact Statement (GMP/EIS) - a 20-year vision for the park's resource protection and management. As part of the GMP process, information was collected from the general public and interested parties regarding future management concerns. The park is currently analyzing public input received on the preliminary management alternatives and is revising the alternatives for the park's marine areas. The scope of the GMP was expanded in 2006 to include a Wilderness Study for the East Everglades Expansion Area lands. The expanded GMP process would fully consider all legislated uses and designations and would result in a viable management plan for the entire park, including the expansion area. The GMP is scheduled for completion in 2011.

###### Fire Management Plan

The Park is preparing an updated Fire Management Plan and associated Environmental Assessment. This project would improve management of wildland fire so that threats to humans and property are reduced while restoring and/or maintaining its function as a natural process. Fire is occasionally used in the Cape Sable area to help control non-native vegetation such as Old World climbing fern (commonly referred to as *lygodium*). Scheduled for completion in 2009, this plan would continue to guide fire management in the Cape Sable area and throughout the park.

###### National Register of Historic Places

Several park facilities and/or structures are currently under consideration for nomination to the National Register of Historic Places (NRHP) including several Mission 66 structures at Flamingo, and the potential nomination of areas to the Underground Railroad network, and the historic Ingraham Highway and associated canals (Homestead and East Cape Canals). The Bear Lake mounds complex is a National Register listed Archeological District. The pre-historic Mud Lake Canal was designated a National Historic Landmark (NHL) on September 20, 2006.

###### South Florida and Caribbean Parks Exotic Plant Management Plan

The NPS has prepared a draft exotic vegetation management plan and environmental impact statement to control non-native plant species in the South Florida and Caribbean NPS units. Implementation of the plan would result in continued control and reduction of non-native plant species in the project area and throughout the park.

### Hurricane Response Plan

In addition to the plans provided above, Everglades National Park has a Hurricane Response Plan that is currently followed at the Park.

### NPS Management Policies 2006

NPS *Management Policies 2006* (Sect. 4.7.2) regarding weather and climate states that the NPS would “gather and maintain baseline climatological data for reference” for parks containing “significant natural resources.” The NPS further states that “the Service would not conduct weather-modification activities” in an attempt to alter naturally occurring conditions in the park (NPS 2006). The NPS would conduct mitigation activities within the park in an attempt to mitigate the effects of climate change.

#### **1.4.5.2 Other Federal Plans, Policies and Actions**

##### Comprehensive Everglades Restoration Plan (CERP)

The comprehensive plan is a framework and guide to restore, protect, and preserve the water resources of central and southern Florida, including several projects affecting Florida Bay. The plan is a component of the world’s largest ecosystem restoration effort; encompassing 16 counties and an 18,000-square-mile area. CERP includes more than 60 elements designed to capture, store and redistribute freshwater previously lost to tide and to regulate the quality, quantity, timing and distribution of flows. Eight CERP projects are intended to provide improvements to flows in and around Everglades National Park. Implementation of CERP would take more than 30 years to complete and is anticipated to cost in excess of \$15 billion. Should the CERP projects be successfully implemented, the park should experience improvements to the quality, quantity, timing and distribution of water flows.

##### Modified Water Deliveries Project

The Modified Water Deliveries (MWD) Project is an ecological restoration project in south Florida designed to improve water delivery to Everglades National Park and is required before the implementation of portions of the CERP Project. MWD consist of structural modifications and additions to the Central and Southern Florida Project (C&SF Project) that improve the timing, distribution, and quantity of water flow to the Northeast Shark River Slough.

##### Tamiami Trail 2

The Tamiami Trail 2 project is being conducted under a separate authority to MWD and is designed to augment the benefits of the MWD Tamiami Trail component. The purpose of the Tamiami Trail Modifications project (Tamiami Trail 2) is to improve water flow from north of Tamiami Trail to Northeast Shark River Slough within Everglades National Park. The National Park Service is now undertaking a feasibility study and EIS to evaluate project alternatives.

#### **1.4.5.3 Other State and Local Plans, Policies and Actions**

Other state and local plans, policies, and actions that would need to be considered include the following:

##### Florida Circumnavigational Saltwater Paddling Trail

A project of the FDEP Office of Greenways and Trails, this paddling trail establishes a sea kayak trail around the State of Florida from near Pensacola to near the Georgia border. This project would bring thousands of paddlers to various areas along the 26 segments of the 1,600-mile sea kayaking trail that ranges from the remote Bog Bend Coast and Everglades/Florida Bay wilderness to the urbanized coastlines of Pinellas County and Fort Lauderdale. Segment 14

extends from Everglades City to Long Key and includes the Wilderness Waterway and Florida Bay in Everglades National Park. The paddling trail assists in educating those who utilize the trail about the 20 national parks, seashores, wildlife refuges and marine sanctuaries, 37 aquatic preserves and 47 coastal state parks in the state. Each segment has reliable managers to coordinate with land managers, private businesses, and volunteers. Supporting departments include the FDEP's Coastal and Aquatic Managed Areas, the South Florida Water Management District, and the Florida Wildlife Federation. The paddling trail was designated as a National Recreation Trail by the Department of the Interior in 2007 (FDEP, 2009).